# How Persistent Low Expected Returns Alter Optimal Life Cycle Saving, Investment, and Retirement Behavior

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# Life Cycle Investing, SoSec Claiming and Low Returns

- ✓ Low interest rates are now a reality not only in the United States, but around the world.
  - Nominal bond yields: US 2.3%, Ger., Swiss, Jap. negative
  - Real returns on bonds: zero / negative

- ✓ Implications on financial decision of private households
  - Asset Allocation (stocks vs bonds)
  - ➢ Asset Location (in- / outside tax qualified plans)
  - ➢ Claiming of SoSec benefits

➢ Answers using a (micro) lifecycle model

# Lifecycle Investing, SoSec Claiming, Low Returns

- ✓ *Mean Wealth of Baby Boomer $ 600,000*
  - *$ 240,000 PV SoSec Benefits*
  - *$ 180,000 home equity*
  - *$ 180,000  financial+pension assets (5 TrY in 401k)*
  - HOW to accumulate, to decumulate, WHERE to invest ?

- ✓ Claiming Social Security *benefits* many households' *most important financial decision:*
  - Mandatory state organized deferred life annuity with complex claiming options & cash flows
  - WHEN retire, WHEN claim benefits (= financial decision)

# Claiming Later Boosts Lifetime Social Security Annuity

*Current rules (NRA = 66)*

| Claiming Age | Benefit as % of PIA | % Boost with 1 year delay | % Boost with N year delay |
|---|---|---|---|
| 62 | 75 | | |
| 63 | 80 | 6.67 | **6.67** |
| 64 | 86.67 | 8.34 | 15.56 |
| 65 | 93.33 | 7.70 | 24.45 |
| 66 | 100 | 7.15 | 33.33 |
| 67 | 108 | 8.00 | 44.0 |
| 68 | 116 | 7.41 | 54.67 |
| 69 | 124 | 6.90 | 65.33 |
| 70 | 132 | 6.45 | **76** |

# Claiming retirement benefits and how to invest

Men age 62, 15 K p.a. SoSec benefits, wealth 200 K, consumption 25K p.a., interest rate 0% (2%), risky equities (mean 6%, vola 18%)

**Scenario 1:** Claim retirement benefits age **62**, invest at 0% (2%) bonds withdrawal 10 K p.a. + 15 K p.a. SoSec

→ Age 82 (87) runing out of money

→ Probability to survive until age 82 (87) = 52% (32%)

**Scenario 2:** Claim age **66**, invest **40% stocks** / 60% bonds at 0% (2%), withdrawal 25 K until 66, withdrawal 5 K + 20 K (higher) SoSec benefit

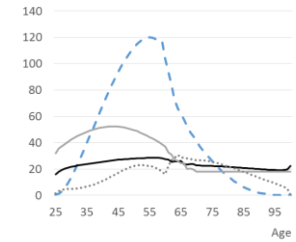
→ Probability runing out of money and still alive = 16% (7%)

**Next step:**

✓ Not all have enough wealth to stop working and delay claiming

✓ Build & calibrate dynamic portfolio model over the complete life cycle,

# Life-Cycle Model: Structure




Preferences
(CRRA)
(cons.& leisure)

Soc Sec options

ERA NRA LRA

Age

20 62 66 70 100

**Wages:** education, age, sex, permanent, transitory shocks

**Social Security:** payroll tax, benefits rules, claiming rules,

**Financial Assets:** risky stocks; bonds; 401(k) plans,

**Institutional Rules:** progressive income, RMD-rules,

numerical dynamic optimization; simulation

Work Hours

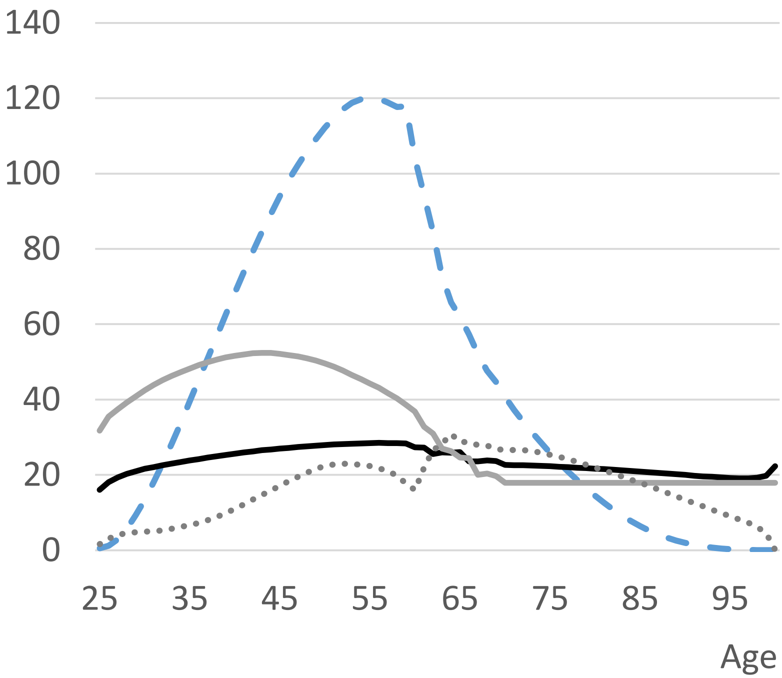
Retirement / SoSec Claiming

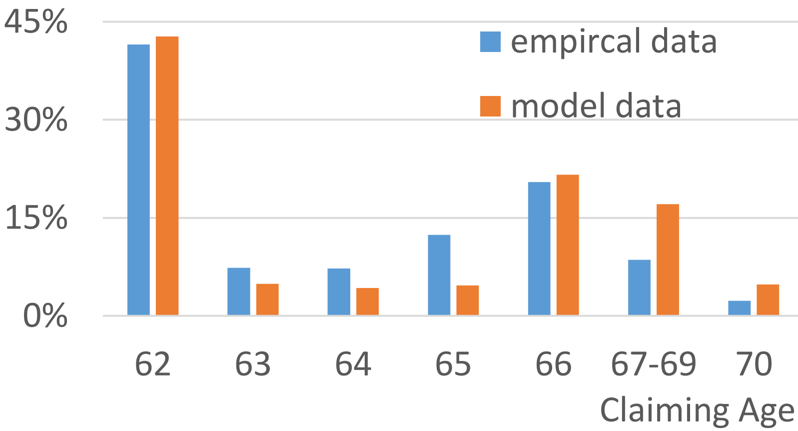
Savings / Consumption

Asset Allocation / Asset Location

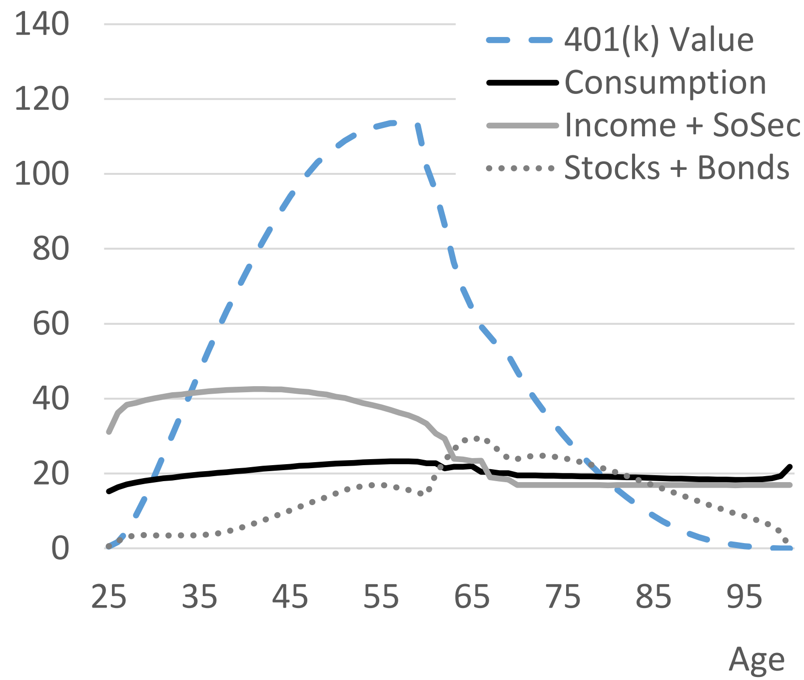
# Life Cycle Profiles – Base case

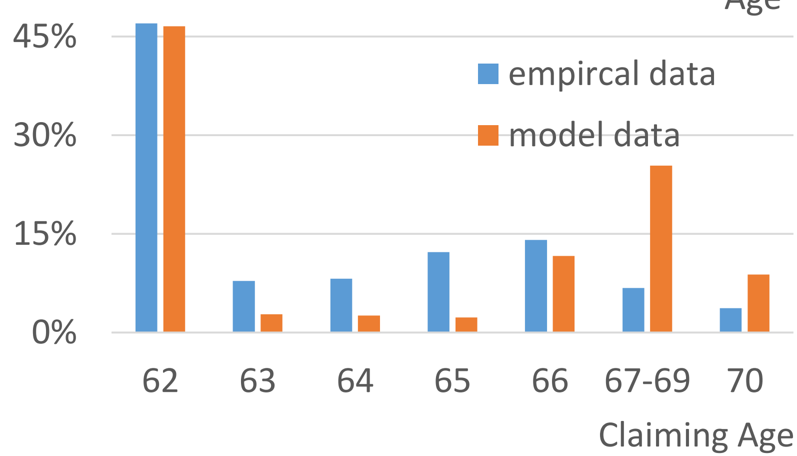
## A. Male Population




## B. Female Population



# Savings / Asset Location – EET vs TTE-Taxation

| | Female | | Male | |
|---|---|---|---|---|
| Interest Rate | 0% | ← 2% | 0% | 2% |
| **Panel A: 401(k) Assets in $000** | | | | |
| Age 25-44 | 37 | 51 | 29 | 43 |
| Age 45-64 | 90 | 121 | 87 | 122 |
| Age 65-74 | 33 | 64 | 27 | 63 |
| **Panel B: Non-Qualified Assets in $000** | | | | |
| Age 25-44 | 7 | 4 | 12 | 8 |
| Age 45-64 | 17 | 13 | 25 | 18 |
| Age 65-74 | 25 | 25 | 28 | 25 |

Lower Interest Rates: Save less in tax-qualified plans

# SoSec Claiming Rates - Low vs. High Interest Rates

| Claiming rates (%) by age | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | Average Claiming Age |
|---|---|---|---|---|---|---|---|---|---|---|
| **Panel A: Females** | | | | | | | | | | |
| Interest Rate | | | | | | | | | | |
| 0% | 46.1 | 2.1 | 2.2 | 3.1 | 7.2 | 5.5 | 9.8 | 10.7 | 13.3 | 65.1 |
| 2% | 47.6 | 2.5 | 2.4 | 2.4 | 13.1 | 9.9 | 9.6 | 5.4 | 6.9 | 64.7 |
| **Panel B: Males** | | | | | | | | | | |
| Interest Rate | | | | | | | | | | |
| 0% | 39.9 | 3.5 | 4.7 | 4.6 | 16.3 | 13.1 | 7.2 | 5.2 | 5.5 | 64.8 |
| 2% | 49.6 | 5.6 | 4.5 | 6.2 | 24.7 | 4.0 | 1.5 | 1.4 | 2.6 | 63.9 |

Lower Interest Rates: Claim later and work longer

# Conclusions:

- First, people are predicted to save less low return periods

- Second, people tend to finance consumption in low rate environment by drawing down their 401(k) assets sooner, delay claiming more, and work longer.

- Third, low rates also change *where* people save. During low-return periods, workers save less in tax-qualified accounts and more outside tax-qualified plans.

- Work longer and (a bit) more,
- Save less and keep consumption,
- Invest different