Retirement, Saving, Benefit Claiming and Solvency Under A Partial System of Voluntary Personal Accounts

Alan Gustman
Thomas Steinmeier

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Research Aims

- Update a structural life cycle model of retirement and wealth.
- Simulate the retirement effects of adopting a system of personal accounts.
- Analyze effects of varying terms of personal account system.
Outcomes Examined

- Retirement
- Participation in Personal Accounts
- Benefits Taken as Lump Sum or Annuity
- Payroll Taxes Paid
- Total Benefits Received
- Course of Benefits with Age
Design Features with Large Effects

- Adoption of Personal Accounts
- Full Replacement vs. Partial Replacement of SS with Personal Accounts
- Lump Sum Payouts vs. Annuities
 Highlights of Findings

Introducing partial accounts will:
- reduce 62 year olds at full time work by 22%.
- increase real (undiscounted) retirement benefits by 25%.

Complete replacement of SS with personal accounts will:
- reduce 62 year olds at full time work by 33%.
- increase real (undiscounted) retirement benefits by 75%.

Allowing lump sum payouts from partial accounts will:
- reduce not retired by 5 percentage points.
- create a large diversion of benefits to age 62, lowering benefits in 70s and 80s by 20%.
Utility Function

\[ U = \int_0^T e^{-\rho t} \sum_{m=0}^{2} s_{m,t} \left( \frac{1}{a} C_{m,t}^a + h_t L_{m,t} \right) dt \]

Heterogeneity

• Time Preference Parameter – \( \rho \)
• Leisure Preferences – \( h_t \)
• Utility of Part-Time Work -- \( L_\rho \)
Asset Accumulation

\[ A_t = (1 + r) A_{t-1} + W_t (1 - L_t) + E_t + B_t - C_t \]

\[ A_t \not\approx 0 \]
### Estimated Results

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Coeff</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\alpha$ Consumption parameter</td>
<td>-0.16</td>
<td>2.60</td>
</tr>
<tr>
<td>$\beta_o$ Constant in $\beta$ Vector</td>
<td>-10.01</td>
<td>246.52</td>
</tr>
<tr>
<td>$\beta_a$ Coefficient of Age</td>
<td>0.084</td>
<td>4.78</td>
</tr>
<tr>
<td>$\beta_h$ Coefficient of Health</td>
<td>4.71</td>
<td>4.54</td>
</tr>
<tr>
<td>$\beta_c$ Coefficient of Cohort</td>
<td>0.03</td>
<td>0.28</td>
</tr>
<tr>
<td>$\delta_o$ Constant in Distribution of $L_p$</td>
<td>-3.75</td>
<td>5.93</td>
</tr>
<tr>
<td>$\delta_a$ Coefficient of Age</td>
<td>0.56</td>
<td>2.66</td>
</tr>
<tr>
<td>$\sigma_\varepsilon$ Standard deviation of $\varepsilon$</td>
<td>5.11</td>
<td>6.06</td>
</tr>
<tr>
<td>$q$ value (38 df):</td>
<td>52.11</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Observations: 2231</td>
</tr>
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</table>
To Conduct Policy Simulations

- Use utility function parameters.
- Alter budget constraint.
- Current model projections:
  - Use each HRS respondent’s work history.
  - Assume current law in place for full lifetime.
    - Age 67 retirement, 8% delayed retirement credit, no earnings test after normal retirement age, payroll tax contribution = 10.6%.
Baseline Personal Account System

- 4% payroll tax diverted to personal accounts.
- 4.31% historical return on mixed portfolio.
- For those with personal account, reduce traditional benefit by 37.7% (4/10.6).
- Minimum required annuity equal to family poverty level.
- Earnings test applies to traditional benefit and mandatory annuity, not to lump sums.
- Lump sums available at 62.
Economic Incentives Created by Personal Accounts

- Personal accounts increase wealth in retirement and thus encourage earlier retirement.
- For those with high time preference rate, lump sum always preferred to annuity.
- Taking a lump sum cash out and consuming it over the next couple of years reduces the marginal value of consumption at age 62, encouraging less work and earlier retirement.
- Substitution effect favors later retirement with personal accounts:
  - for high earners additional work increases later benefits more than under traditional system.
Choices Made Based on Utility Maximization

- Participate in personal account or fully rely on traditional benefits.
- When to leave long term job.
- When to partially retire.
- When to fully retire.
- When to claim benefits.
- Take benefit as lump sum or annuity.
Actual and Simulated Rates of Retiring From Full Time Work by Age

The graph shows the actual and simulated rates of retiring from full-time work by age. The x-axis represents age, ranging from 50 to 70, and the y-axis represents the percent retiring, ranging from 0 to 16.

There are two lines on the graph: one for observed data (blue) and one for simulated data (red). The observed data shows a peak around age 62, while the simulated data also peaks but slightly lower around the same age. Both lines show a general decrease in retirement rates as age increases.
Observed and Simulated Rates of Into Full Retirement by Age

![Graph showing observed and simulated retirement rates by age. The graph has two lines, one for observed and one for simulated rates. The x-axis represents age from 50 to 70, and the y-axis represents retirement rates from 0 to 14. The observed rates are shown in blue, and the simulated rates are shown in red. There are peaks and troughs in both lines, indicating variations in retirement rates by age.]
Observed and Simulated Percent Retired From Full Time Work by Age

Percent Retired

Age

Observed
Simulated
Percent Not Retired at Age 62 by Program Provision

1. Current law
2. Base package of personal accounts
3. Total conversion to personal accounts
4. Full annuitization required
5. Annuitization optional, full lump sum withdrawal permitted
Retirement Status at Age 62 by Program Provision

- 1. Current law
- 2. Base package of personal accounts
- 3. Total conversion to personal accounts
- 4. Full annuitization required
- 5. Annuitization optional, full lump sum withdrawal permitted

<table>
<thead>
<tr>
<th>Percent</th>
<th>Not Retired</th>
<th>Partially Retired</th>
<th>Fully Retired</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Current law</td>
<td>40%</td>
<td>10%</td>
<td>50%</td>
</tr>
<tr>
<td>2. Base package of personal accounts</td>
<td>30%</td>
<td>20%</td>
<td>50%</td>
</tr>
<tr>
<td>3. Total conversion to personal accounts</td>
<td>25%</td>
<td>15%</td>
<td>60%</td>
</tr>
<tr>
<td>4. Full annuitization required</td>
<td>20%</td>
<td>10%</td>
<td>70%</td>
</tr>
<tr>
<td>5. Annuitization optional, full lump sum withdrawal permitted</td>
<td>15%</td>
<td>5%</td>
<td>80%</td>
</tr>
</tbody>
</table>
Rate of Retirement from Full Time Work at Age 62

1. Current law
2. Base package of personal accounts
3. Total conversion to personal accounts
4. Full annuitization required
5. Annuitzation optional, full lump sum withdrawal permitted
1. Current law projections of traditional Social Security

2. Base package of personal accounts

3. Total conversion to personal accounts

4. Full annuitization required

5. Annuitization optional, full lump sum withdrawal permitted

Undiscounted Sum of Real Retirement Benefits Under Alternative Programs

Thousands of Dollars

<table>
<thead>
<tr>
<th></th>
<th>Social Security</th>
<th>Personal Account Benefits</th>
<th>Total Benefits</th>
</tr>
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<tbody>
<tr>
<td>1. Current law projections</td>
<td>329</td>
<td>329</td>
<td>410</td>
</tr>
<tr>
<td>of traditional Social</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td></td>
<td></td>
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<tr>
<td>2. Base package of personal</td>
<td>200</td>
<td>211</td>
<td>410</td>
</tr>
<tr>
<td>accounts</td>
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<td></td>
</tr>
<tr>
<td>3. Total conversion to</td>
<td>0</td>
<td>574</td>
<td>577</td>
</tr>
<tr>
<td>personal accounts</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4. Full annuitization</td>
<td>200</td>
<td>251</td>
<td>451</td>
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<tr>
<td>required</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Annuitization optional,</td>
<td>200</td>
<td>208</td>
<td>407</td>
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<tr>
<td>full lump sum withdrawal</td>
<td></td>
<td></td>
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<tr>
<td>permitted</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Undiscounted Sum of Real Payroll Taxes from Ages 50 to 69

1. Current law projections of traditional Social Security
2. Base package of personal accounts
3. Total conversion to personal accounts
4. Full annuitization required
5. Annuitization optional, full lump sum withdrawal permitted
Total of Traditional Social Security Benefits, Lump Sum Payments and Annuity by Age of Receipt

Real Undiscounted Benefits Adjusted for Mortality

1. Current law projections of traditional Social Security
2. Base package of personal accounts
3. Total conversion to personal accounts
4. Full annuitization required
5. Annuitization optional, full lump sum withdrawal permitted
Real, Undiscounted, Benefits by Age Under Baseline Personal Accounts
Adjusted for Mortality
Real, Undiscounted, Benefits by Age and by Program
Adjusted for Mortality

1. Current law projections of traditional Social Security
2. Base package of personal accounts
3. Total conversion to personal accounts
4. Full annuitization required
5. Annuitization optional, full lump sum withdrawal permitted
Also Examined

- Pro rata vs. offset method of President’s Commission proposal.
  - Limited effects on outcomes examined.
  - With offset method, individual with personal account not insured against further changes in conventional benefits.
- Sensitivity to amount of required annuity.
  - Individual poverty level.
  - Single vs. joint and survivors annuity.
- Voluntary vs. mandatory annuity
Caveats

- Did not require benefits and taxes to be in balance for each policy.
- Model includes uncertain lifetime, but not uncertain returns.
  - Our model with uncertain returns does not yet include partial and full retirement.
- No adjustment for perceived political risk when choosing between personal accounts and traditional benefits, or date of claiming.
Value of Leisure

\[ h_t = e^{\beta X_t + e} \]

\[ \beta X_t = \beta_o + \beta_a \text{ Age} + \beta_h \text{ Health} + \beta_c \text{ Cohort} \]
$L_\rho$ and $\varepsilon$ are random effects

$e_t \sim N(0, s_e^2)$

$f(L_\rho) = k e^{d L_\rho}$

$d = d_o + d_a \text{ Age}$

$\rho$ is treated as a fixed effect
Method of Estimation -- GMM

\[ q = m' w^{-1} m \]

\[ w = \sum_{i=1}^{n} m_i m_i' \]

\[ \text{Var}(?) = \left[ G' w^{-1} G \right]^{-1} \]
Moments Used

At ages 54-66:
- Percent working full time

At ages 55, 58, 60, 62 & 65:
- Percent fully retired
- In poor health, percent working full time
- Born < 1934, percent working full time
- Born > 1938, percent working full time
- With Y < $1.25M, percent working FT
- With Y > $1.90M, percent working FT
Utility Function

\[ U = \int_0^T e^{-\rho t} \sum_{m=0}^{2} \left\{ s_{m,t} \left[ \frac{1}{\alpha} C_{m,t}^\alpha + h_t \frac{1}{\gamma} L_{m,t}^\gamma \right] \right\} \ dt \]

Heterogeneity

- Time Preference Parameter – \( \rho \)
- Leisure Preferences – \( h_t \)
- Utility of Part-Time Work -- \( L_\rho \)