LECTURE: SOCIAL SECURITY

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OUTLINE OF LECTURE:

1. Introduction and definitions
2. Institutional Details in Social Security
3. Social Security and Redistribution
4. Justification for Government Involvement
SOCIAL SECURITY

Social Insurance Programs
Features of social insurance programs (in contrast to public assistance)
-- Compulsory (yes)
-- Contributory (payroll taxes)
-- Provides benefits when condition is met (old age)
-- Benefits limited to those who have paid in (work history)
-- Mechanism for society to pool risk for events that have catastrophic consequences (loss of a job) or events people do not plan adequately for (retirement)
-- Benefits tied to previous labor market experience

Biggest of the social insurance programs.
Different from other “income security” programs we have studied so far in that it is less designed to insure against unanticipated shocks; instead getting old.
Social Security

Same issues of protection and distortion are relevant here in the optimal design of SS.

**Protection:** Insurance to protect against poverty and reductions in standard of living that can occur when earnings stop

**Distortion:** Benefits are conditional on employment and are funded by taxes while working. Deadweight loss from the program’s alteration of people’s behavior

**Important questions in SS literature**
-- How does Social Security affect private savings?
-- How does Social Security affect retirement?
-- What are the distributional implications for SS?
-- Privatization of SS
**Important concepts for understanding pensions**

**Defined Benefit (DB):**
Benefits in retirement defined by rules (age, earnings, etc.) and benefit formulas. Rate of return on contributions certain at time of contribution

**Defined Contribution (DC):**
Benefits in retirement determined by contributions. Rules dictate contributions by employer and employee. Funds placed in account-- worker gets gross return. Rate of return on contributions uncertain at time of contribution.

**Funded:**
Assets are “in the bank” to pay obligations (outstanding benefits)

**Unfunded:**
No assets are accumulated – current workers’ contributions fund current retiree’s benefits. Pure unfunded programs are often referred to as “Pay as you go” [PAYG]

**Actuarily Fair**
Defined for an individual worker
PDV (taxes or contributions) = PDV (benefits)
Examples:

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<th>Funded</th>
<th>DB</th>
<th>DC</th>
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<tbody>
<tr>
<td>Private pensions (older larger firms, traditional private pension vehicle)</td>
<td>IRA / 401(K) programs</td>
<td>Private pensions (newer, smaller firms, most common form)</td>
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<td>S&amp;L Govt pensions</td>
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<td>Univ of CA</td>
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<td>Newly adopted SS programs outside US (Chili, Mexico, Argentina, Australia)</td>
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<th>Unfunded</th>
<th>US Social Security</th>
<th>Less common Sweden?</th>
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US Social Security Program

OASDHI:
OASI: Old age Survivors
DI: Disability Insurance
HI: Hospital Insurance
SMI: Supplemental Medical Insurance

Timeline:
1935: Social Security Act (initiated Social Security)
1960: DI added
1961: Retirement allowed at age 62
1965: HI, SMI (Medicare) added
Funding
Historically, SS is PAYG system; now some accumulation
Recall definition of “pay as you go” ➔ Current taxes = Current benefits

1950-1985: No surplus, pure pay as you go
Tax rates low since the ratio of workers to retirees is high

1985: Huge surplus
Tax rates increased (1977, 1983) to build up the fund so that as the ratio of workers to retirees decreases (baby boom generation) the system does not go bankrupt
Trust fund now $1 trillion; liabilities of $9 trillion

Financing:
Paid out of payroll tax on earnings.
Tax rates
Social Security:
  6.2% (employee) + 6.2% (employer); flat tax up to maximum earnings
  15.3% for self employed
Medicare: 1.45% (no maximum)
**Benefit Formula**
Benefits are a function of: age at retirement, average earnings, growth in real wages, and family structure.

**Definition:** *AIME (Average Indexed Monthly Earnings)*
- Average monthly earnings in covered employment
- Indexed to changes in real wages
- Based on 35 years of highest earnings

**Definition:** *PIA (Primary Insurance Amount)*
- Set at retirement
- Used as “base” for all future benefits

**In 2003:**
PIA = 0.90*(1<sup>st</sup> $606 of AIME)  
+ 0.32*(of $606-$3,653 of AIME)  
+ 0.15*(AIME>$3653)

Redistribution in formula: higher replacement rate for lower AIME workers
Benefit in year $t$: $B_t = PIA \times \frac{CPI_t}{CPI_{\text{retirement}}}$

“Retirement Date”
62 year old early retirement – benefits based on 80% PIA
65 year old normal retirement – benefits based on 100% PIA
(Existing legislation gradually increasing normal retirement age to 67)
Adjustment from 80-100% from 62-65 is actuarially fair adjustment for average recipient

Earnings Test
In 1992: Earnings < $7440 per year penalty free
          Earnings >$7440 per year taxed at 50% rate

Adjustments to PIA
-- Married: choose better of either (a) 150% of higher PIA or (b) sum of PIAs
-- Surviving spouse earns 100% of deceased spouse’s PIA
-- Death benefits to children
Redistribution in Social Security Program

Several papers have used representative samples of retirees to construct the pdv of lifetime SS taxes and projected SS benefits. This can be used to construct an internal rate of return on the investment:

\[
\text{Definition: } i \text{ such that } \sum_{a=0}^{\text{MaxAge}} \frac{(Ba - Ta)}{(1 + i)^a} = 0
\]

This can be used to compare the internal rate of return (IRR) within and across cohorts.

The research shows that there is redistribution:

- **Across generations:** Part of early justification of the program was to transfer $ from younger, richer cohorts to older cohorts. IRR clearly falling over time. (See Table 1 in Feldstein and Liebman)
- **Within generations** – by income. Higher IRR for lower income earnings. PIA formula. Offsets progressive tax structure
- **Within generations** – by family structure. Higher IRR for single earning married couples.
- **Within generations** – from unhealthy to healthy. Lower life expectancy means lower PDV of benefits.
How does Social Security differ from a simple annuity?

[Definition of simple annuity: Take tax contributions and purchase “bond” at age 65 that yields certain return forever.]

1. Redistribution (within cohort) -- see PIA formula
2. Not actuarially fair (across cohorts)
3. Surviving spouse/child
4. Earnings test
5. Indexed to wages, prices
6. Cannot be sold
Rationale for Social Security:

1. Market failure (adverse selection)
   Social security is a real annuity (e.g. COLA adjustment in US SS)
   Until recently no such securities available (US Treasury now offers these)
   Annuity companies face adverse selection (only health sign up)

2. Paternalism
   People are myopic and undersave
   Why? Lack of information; high discount rate?
   What is enough? How to measure?

3. Samaritan’s dilemma
   Without SS (forced savings), then some people will end up poor and old. At that point you want to help them. So you might as well force them to save to begin with.

4. Redistribution based on lifetime earnings
   Other sources of redistribution well documented.
Basic Economics of Pay as you go Social Security
Outlined in Samulson’s seminal paper JPE 1958 paper.

Generalization of Samuelson’s model in 2 period Overlapping Generations Model (Feldstein and Liebman, Handbook of Public Economics)

Assumptions:
Identical Individuals
Each agent lives for 2 periods
Work a fixed amount in period 1, retire in period 2
Population growth rate = $n$
No capital, no money
Can not save for old age (good is perfectly perishable)

Notation:
$L_t =$ # of workers in period $t$
$W =$ wage rate
$B_t =$ SS benefit
$T_t =$ SS taxes
$\theta =$ SS tax rate
Implications:

\[ L_{t+1} = (1 + n)L_t \] labor growth (population=workers)

\[ T_t = \theta L_t w \] aggregate tax revenue

\[ B_t = T_t = \theta L_t w \] PAYG \( \Rightarrow \) benefits=taxes in year \( t \)

Rate of Return for person in cohort \( t \):

Taxes paid as worker: \[ T_t = \theta L_t w \]

Benefits received as retired: \[ B_{t+1} = \theta L_{t+1} w = \theta(1 + n)L_t w \]
Taking ratios generates the internal rate of return (IRR):

\[
\frac{B_{t+1}}{T_t} = \frac{\theta(1 + n)L_t w}{\theta L_t w} = 1 + n = \text{Internal rate of return}
\]

Samuelson called \( n \) the “biological rate of interest.” Even an unfunded SS program pays interest!

Also, note the windfall received by the 1\(^{st}\) generation:

\[
\frac{B_1}{T_0} = \frac{-}{0} = \infty
\]

Connecting back to rationale for SS: SS is desirable since it permits individuals to retire and consume despite all perishable goods.

Key result of Samuelson: In a world without a capital good, SS leads to pareto improvement by making inter-generational trade feasible.
Adding technological progress (wage growth)

\[ w_{t+1} = (1 + g)w_t \]

Internal Rate of Return=

\[ \frac{B_{t+1}}{T_t} \theta(1 + n)L_t(1 + g)w \overline{\theta L_t w} = (1 + g)(1 + n) \]
Despite simplicities, the model demonstrates realities of PAYG SS system:
-- High g and/or high n will yield a high rate of return (pareto improvement)
-- In the United States currently – both g and n falling over time, yielding falling returns

1960-1999: Real wage bill grown by 2.8% (real wage growth 1%, labor force growth 1.8%)

Wages/beneficiary: 3.27 in 1995, 2.04 in 2030

Reason for increasing wages and building up trust fund is to not have to raise tax rates by so much later.
**Adding Capital Stock**
With a non-perishable good, then consumers can save from one period to the other. Evaluating impacts of SS are different in that model. *Feldstein and Liebman present this in their chapter.*

**Tax-Benefit Linkage?**
Note: There is a deadweight loss on pre-retirement earnings due to payroll tax AS LONG AS tax is viewed as a tax and not a benefit.

**Back to balancing distortion and protection**
Optimal SS system has to balance these two parts:
1. Protection: Providing basic consumption for those who are too myopic to save for themselves
2. Distortion: Providing a lower rate of return for those who ARE NOT myopic and therefore would have saved adequately for their retirement.
   - Crowding out other saving
   - Distorts retirement and labor supply

*Feldstein and Liebman present SS optimal tax in chapter.*