II A. Social Security

1. Financial risk
   - We face risks every day that are both financial and non-financial. This discussion will be only about financial risks.
   - Examples?
   - People enter into some risky situations voluntarily, for fun.
   - Examples?
   - Generally, people act as though they would prefer to avoid financial risk unless compensated for it.
   - We say that most people in most circumstances are risk averse.

   - "Risk averse" is not the same as saying that most people would rather avoid loss.
   - It means that they would rather accept a small, certain loss than risk a large loss even though it is very improbable.
   - E. g., errors and omissions insurance
   - E. g., fire insurance

2. Insurance
   - Insurance is a device for sharing independent risks.
   - Example:
     - 10,000 people each at risk to lose $1,000.
     - Probability of loss is 1%.
     - How many people are likely to actually lose $1,000?
     - How much would each of the 10,000 need to chip in for a pot that would compensate the losers?
   - Complications:
     - Cost of administration
     - Number who lose might be either more or less than 100.
With a 1% probability of loss, there is a 99% probability that the number of insured suffering loss will fall in this range, per 1,000 insured:

<table>
<thead>
<tr>
<th>Number insured</th>
<th>low end</th>
<th>high end</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000</td>
<td>0.56</td>
<td>19.44</td>
</tr>
<tr>
<td>10,000</td>
<td>7.02</td>
<td>12.98</td>
</tr>
<tr>
<td>100,000</td>
<td>9.06</td>
<td>10.94</td>
</tr>
<tr>
<td>1,000,000</td>
<td>9.70</td>
<td>10.30</td>
</tr>
<tr>
<td>10,000,000</td>
<td>9.91</td>
<td>10.09</td>
</tr>
<tr>
<td>100,000,000</td>
<td>9.97</td>
<td>10.03</td>
</tr>
<tr>
<td>1,000,000,000</td>
<td>9.99</td>
<td>10.01</td>
</tr>
</tbody>
</table>

What does independence of risks mean?

- Independence means that the chance that I will suffer a loss is independent of the chance that you will suffer a loss.
- If we each face a 1% chance of loss and the risks are independent, the chance that we will both suffer a loss is just 1% of 1%: .01%

Why is independence of risks important?

- If the risks are not independent, the insurer can’t count on the law of averages to limit the total losses he might face.
- For example:
  - Insurance against earthquakes, if all of your insurance is in one earthquake-prone city.
  - Insurance against floods if all of your insureds live along the same river.
  - Insurance against property damage due to war.

2. Insurance

- Insurance is a contract to protect against financial risk.
  - The insured agrees to pay a price (the premium) in exchange for a (larger) payment to be received only if the specified financial loss occurs.
  - The insurer acts like the house in a casino, agreeing to pay in case a low probability event occurs, but betting on so many such independent events that the average payout per thousand dollars at risk is roughly constant.
- Examples of kinds of insurance

2. Insurance

a. Insurable risks

- Not all financial risks can be insured against.
- A list of criteria for an insurable risk:
  1. The insured loss must have a definite time and place;
  2. The insured event must be accidental;
  3. The insured must have an insurable interest in the subject of coverage;
  4. The insured risks must belong to a sufficiently large group of homogeneous exposure units to make losses predictable;
  (continued…)

Insurable risks

5. The risk must not be subject to a catastrophic loss where a large number of exposure units can be damaged or destroyed in a single event;
6. The coverage must be provided at a reasonable cost;
7. The chance of loss must be calculable.
(From Rupp's Insurance & Risk Management Glossary. © 2002, NILS Publishing. All rights reserved.)
That list should be treated with skepticism (for reasons to be discussed in class), but is roughly accurate.
2. Insurance

b. Private information and adverse selection
- For markets to work well (i.e., lead to efficiency in the allocation of resources) we assume that
  - buyers know what they are buying,
  - sellers know both what they are selling and exactly what they are getting in return.
- When either the buyer or seller has private information not available to the other side in the transaction, there is a danger that the market will be inefficient; in extreme cases the market will not exist.
  - A big problem with a public good is to coax people to reveal how much they are willing to pay for it.

Private information and adverse selection
- The issue of private information is particularly troublesome in insurance markets.
- The insurer might know the average probability of loss for everyone in the population
  - But not know the probability of loss for each specific person.
- Suppose that I learn that I have a disease that will be expensive to treat and might shorten my life.
- I am much more likely to want to buy health insurance or life insurance after I learn that fact than I was before.

Adverse selection
- That is an example of adverse selection.
  - If insurance is offered and potential buyers know more about their risk than the seller knows, those who need the insurance most will buy it; those who need it least will not buy it.
  - There were people in southern MN trying to buy flood insurance as the river rose outside their doors.
    - It didn’t work that way
    - More generally, people who live on hills don’t want flood insurance. Those who build on flood plains do.

Adverse selection
- The result of adverse selection:
  - the population of those who buy the insurance faces on average a higher risk than the general population.
- This drives up the insurance premium, which drives away more of those with lowest risk.
- We can end up with a lot of people who would benefit from insurance unable to buy it at a fair price.
  - Private, individual health insurance in the U. S. faces that problem.

2. Insurance

c. Strategic behavior and moral hazard
- In any contract, both sides of the transaction have an incentive to renege on their responsibilities.
- A salesperson has an incentive to not work very hard at selling the employer’s product.
  - the employer can guard against that either by monitoring (as in a store) or by using commissions as an incentive.
- A student who is not very interested in this course has an incentive to not read the assignments.
  - I can guard against that by asking you details about the reading, especially in an exam.

Strategic behavior and moral hazard
- Economic studies have shown that enforced seat belt laws and air bags lead drivers to take more risks when driving.
- By strategic behavior I mean deliberately modifying your behavior depending on the nature of the environment you face.
- In insurance markets and other financial contracts, the problems created by strategic behavior are called moral hazard.
  - The person with fire insurance is more likely to store gasoline for his lawn mower in his basement than is one without fire insurance – the act of buying the insurance increases the risk of what is insured against.
- Now we turn to social insurance.
3. Social Insurance

- a. Background on social insurance
- Programs financed by social security taxes in the US are abbreviated OASDHI. They include
  - Old Age insurance (OAI)
  - Survivors insurance (SI)
  - Disability insurance (DI) and
  - Health insurance (HI, for Medicare)

Social security

- Financed by
  - 6.2% FICA tax on employee’s capped wages paid by employee (up to $102,000 in 2008) and
  - 6.2% tax on capped wages paid by employer, for OASDI, and
  - 1.45% on uncapped wages paid by employee and 1.45% paid by employer for Medicare.
  - The self-employed pay double: 12.4% for OASDI, and 2.9% for Medicare.
  - Notice that is on total wages, not taxable income.
- No personal exemption or deductions.
- FICA (Federal Insurance Contributions Act) is the legislation that sets the tax rates paid for OASDHI.

O’Rourke, Ch. 6. From beatnik to business major

1. The market is never wrong
   - Whatever price the market sets is the right price
   - Is this the same as Lerner’s “genuine” (i.e., market-clearing) price? Or his “correct” price (i.e., price = marginal cost)? Or is it something else?

2. “So you die. Things still cost what they cost.”
   - It’s no use trying to fix prices
     - What happens when prices are fixed below the genuine price?
     - What happens when prices are fixed above the genuine price?

O’Rourke, Ch. 6. From beatnik to business major

3. You can’t get something for nothing
   - Deficit financing for bread and circuses doesn’t mean that they cost nothing.
   - If govt. borrows for bread and circuses, the funds aren’t available for productive investment.

4. You can’t have everything
   - Every decision carries opportunity costs

5. “Break it and you bought it”
   - Don’t get fooled into thinking that war is a good thing because it creates jobs. Wasting resources (and lives) is always bad.

6. Good is not as good as better
   - Putting people out of work may look bad, but when new technology that lowers the cost of production is responsible, it is good.

7. The past is past
   - Ignore sunk costs

8. Build it and they will come
   - Supply creates its own demand

9. Everybody gets paid
   - Don’t believe “I’m from the government and I’m here to help you.” Government officials are out to benefit themselves, just like everyone else.
10. Everybody is an expert
   - Specialization and the division of labor make us rich
   - Especially, the law of comparative advantage makes us rich.

   Note: The rest of Ch. 6 discusses money. The discussion is fairly accurate, especially the historical progression from commodity money to fiduciary money to fiat money. But it takes us too far afield to discuss, unless someone has a question about it.

Social insurance

b. Why should government be involved in social insurance?
   - Does it meet the normal criteria? Which of following reasons would justify government intervention in the market?
     - Public good
     - Imperfect information
       - Is there a problem of adverse selection that could justify social insurance, rather than private insurance?
       - What about indexing to inflation?
     - Are consumers knowledgeable when they decide how much to save for retirement and where to invest the money?
     - External benefits or cost

   (Continued on next page)

Social insurance

c. Pay-as-you-go vs. fully-funded insurance
   - Private insurance and retirement annuities are fully funded.
   - This means that each buyer pays enough so that on average each one will pay for their own benefits, combining the premiums that they pay with the interest earned on their accumulated savings.
   - How does the economy afford to pay the interest that helps to accumulate the insurance or pension funds?

Fully funded insurance

- The insurance company lends or invests the premiums to finance new investment projects (roughly speaking).
- The investment projects increase total output in the economy, generating the funds to pay the insurance or pension.
- The interest earnings are the earnings generated by the increase in capital that the premiums represent.
- The policy holders on the average get back more than they put in through premiums as a result of these interest earnings.
Pay-as-you-go insurance

- Social insurance, and the U.S. social security program in particular, is (roughly speaking) pay-as-you-go.
  - Pay-as-you-go means that no new capital is created by the premiums (i.e., FICA taxes) that are paid by workers.
  - Instead those funds are immediately paid out to retired people (under OASI), to survivors (under SI) or to the disabled (under DI).
  - There is no fund created from premiums plus accumulated interest.
- There is no increase in total output in the economy created by new capital financed by these premiums.

Pay-as-you-go insurance

- We will see that workers can still get back more than they put in as long as
  - the total wage bill is growing, because
    - the number of covered workers is increasing, or
    - the covered wages are increasing (or both).
- Numerical exercises will demonstrate this.

4. Gramlich, Different approaches for dealing with Social Security

i. Actuarial balance

- In US, population is aging so dependency ratio is rising (.29 in ’95 to .50 in 2030, when the last of the baby boomers reach “normal retirement age”, to .56 in 2070).
- If replacement rate does not change, combined tax rate needs to increase from 12% in 1995 to 17% in 2030 and 19% in 2070, continuing to rise thereafter.

a. 1995 Trustees’ Report

- Financial problems for social security system result from 2 trends:
  - First is “actuarial balance” (represented by accounting identity below).
  - Rate of return (also discussed below).
- Accounting identity for stable system with pay-as-you-go financing:
  \[ t = \frac{B \times S}{W \times N} \]
  \[ = \frac{B}{W} \times \frac{S}{N} = \text{replacement rate} \times \text{dependency ratio} \]
  \[ = \text{benefit/wage} \times \text{beneficiaries/worker} \]

ii. Rate of return

- (Real) rate of return for stable system with pay-as-you-go financing is equal to rate of growth of the economy’s real wage bill (real wage x no. of workers).
  - “Real” means taking out the effect of inflation.
    - E.g., with inflation of 3%, wages have to grow by 3% just to keep buying power constant. If wages in fact grow by 5%, the real rate of growth is
      \[ 5\% - 3\% = 2\% \]
    - If wages in fact grow by only 1% when inflation is 3%, the real rate of growth is
      \[ 1\% - 3\% = -2\% \]
ii. Rate of return

- Long run real wage bill is anticipated to grow at 1% per year.
- Trustees’ projection of tax payments into the system and benefits out of the system use an interest rate of 2.3% per year.
- Implies that for younger cohorts, discounted future benefits will fall relative to discounted future tax payments.
  - Ratio of discounted future benefits to discounted future tax payments is called the “money’s worth ratio; this ratio will fall. Figures 1 and 2 in his paper (see below) show change.

Problem facing Gramlich council

- Question of how to balance rise in tax with declines in benefits while preserving popularity of system was problem addressed by the council chaired by Gramlich in 1996.
- As background for the discussion of alternatives, we need some definitions.

Defined benefit v. defined contribution

- A defined benefit pension program ties the size of the benefit to the beneficiary’s earnings while working.
  - In private pensions, the link is typically to the average earnings in the five years where earnings were highest.
  - In the social security system, the size of the benefit is based on earnings over a 35-year period
    - but earnings from earlier years are adjusted upward by the average increase in covered wages.
    - This is like an adjustment for inflation but is typically higher because wages generally grow faster than prices.
    - We have been getting better off over time, at about 1% per year.

Defined benefit v. defined contribution

- Risk, in a defined benefit program, falls to the employer (or financer of the program) to make sure that funds grow fast enough to keep up with rise in wages.
- A defined contribution pension program does not commit to any particular level of benefits.
  - It commits to a level of contribution into a fund each year, with that fund to be invested, typically with the investments chosen by the beneficiary from a range of alternatives.

Defined benefit v. defined contribution

- Whatever the fund accumulates to by the age of retirement is what you get for retirement funds, perhaps to be converted into a life annuity to help assure that you won’t run out of money.
- Risk, in a defined contribution program, falls to the beneficiary to make sure that funds grow fast enough to keep up with rise in wages.

Investment in equities

- Stocks have earned a higher rate of return than bonds over many years,
  - at the price of higher risk: the returns are more variable.
- It is usually argued that retirement funds should be invested at least partly in stocks to take advantage of the higher growth.
- (Later readings will expand on this issue).
Alternative approaches considered by council

i. Maintain benefits
   - Increase taxes on SS benefits; invest some SS funds in equities.

ii. Individual accounts
   - Add small, mandatory defined contribution individual accounts added to current SS system, with the individual accounts held by SS and invested in index funds until retirement.

iii. Personal security accounts
   - Gradually replace the present SS system with a large-scale defined contribution system, outside the Social Security trust fund, which could be invested in equities.

   i. Maintain benefits
      - This approach tries to preserve present system as much as possible.
        - Only small changes in replacement rates, but more of the benefits will be taxed.
          - The new taxes would be diverted to the Social Security trust funds (as current taxes on SS receipts are). Bad economics (to tie tax receipts to any particular program) but good politics.
          - Contrast with private pensions: now benefits are taxed when received but contributions are tax deductible. Social security taxes are not tax deductible, so this change would be harsher tax treatment than is true for private pensions.
          - This is one way to make current beneficiaries, who have a fairly good return, pay for part of the current actuarial imbalance.

   ii. Individual accounts
      - Scales back benefits to eliminate the long-term actuarial deficit.
        - Raise “normal retirement age” to receive full benefits, through next century.
        - Reduce replacement rates for high-wage workers.
        - Create mandatory individual (defined contribution) accounts, 1.6% of covered payrolls.
          - Held by Social Security System
          - Owner can choose bonds or stocks (index accounts)
          - Compared to proposal i, decentralizes the investment decision
          - May be more palatable than raising FICA payroll tax rates.

   iii. Personal security accounts
      - Large step toward privatizing SS.
        - 2.4% of the 12.4% FICA tax would continue to be used for survivor and disability insurance.
        - Employer share of the remainder (5% of covered payroll) would in long run equilibrium finance a flat pension benefit of about 2/3 poverty level of income.
        - Employee share of the remainder (also 5%) would go into an individual retirement account held by private investment companies with broader choice over kinds of investments and (undoubtedly) with higher fees.
          - Actual proposal would allow owner to withdraw all of these funds on retirement with no guarantee that any would be kept for future need.

   i. Maintain benefits
   - Expansion of revenue by expanding the income base on which social security taxes are levied.
   - Hope to increase return on trust fund by gradually investing in equities, up to 40% of assets. (Now, entirely invested in U. S. Treasury securities).
     - Will equity premium hold up?
     - Who decides what equities to invest in? Scope for much political mischief, and bad investments that transfer funds from social security to corporations. Investment pool would be huge, about $1 trillion at today’s rates.

   ii. Individual accounts
   - Scales back benefits to eliminate the long-term actuarial deficit.
     - Raise “normal retirement age” to receive full benefits, through next century.
     - Reduce replacement rates for high-wage workers.
     - Create mandatory individual (defined contribution) accounts, 1.6% of covered payrolls.
       - Held by Social Security System
       - Owner can choose bonds or stocks (index accounts)
       - Compared to proposal i, decentralizes the investment decision
       - May be more palatable than raising FICA payroll tax rates.

   iii. Personal security accounts
   - Transition problem would be serious.
     - Because we are now on essentially a pay-as-you-go system, in a transition period some workers would be paying both for the current retired and also putting away money for their own retirement,
       - since after the transition workers will no longer be supporting the retired.
     - Requires a transition tax, of roughly 1.5% of total payrolls or 1% of total consumption, for 100 years or more.
A 4th alternative: later retirement

• Increase in dependency ratio is main reason for projected social security deficit.
• Increased life expectancy is main reason for that increase.
• Baseline forecast assumes 34% drop in mortality rates for the aged from 1998 to 2073.
  – In 1965 life expectancy for men aged 65 was 13.5 years; for women, 18 years.
  – In 1985 those numbers will increase to 18.4 and 21.9.
• See table on next slide:

Krugman, Confusions about Social Security

1. The trust fund

• “Privatizers” argue that the SS Trust Fund is meaningless, since it holds only government bonds.
  – But that means that the concept of walling off social security from the rest of the government is meaningless.
  – The “crisis” in social security occurs only if one assumes that there is a firewall between social security funds and the rest of the government.
  – Once one admits that the firewall is a fiction, the notion of a SS funding crisis is also seen to be a fiction.
  – There can be a general budget crisis, but not a SS funding crisis.

“The Implications of Social Security Long-Range Financial Projections”, Lawrence H. Thompson

TABLE 2.
Impact of Alternative Demographic Assumptions on Cost Projections: Difference between the Present Value of Income and the Present Value of Costs by 25-Year Subperiod under Different Demographic Assumptions (percentage of taxable payroll)

<table>
<thead>
<tr>
<th>Assumption</th>
<th>1998-2013</th>
<th>2026-2048</th>
<th>2048-2073</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline: 34% drop in mortality, 25% increase in men’s and 47% in women’s disability rates, drop in fertility to 1.9 and real wage increase to 0.9%</td>
<td>-0.20</td>
<td>-0.67</td>
<td>-0.71</td>
</tr>
<tr>
<td>1. Baseline intermediate projection</td>
<td>-0.58</td>
<td>-1.91</td>
<td>-2.05</td>
</tr>
<tr>
<td>2. No mortality improvements</td>
<td>-0.70</td>
<td>-2.75</td>
<td>-2.82</td>
</tr>
<tr>
<td>3. No mortality improvements and little increase in disability</td>
<td>-0.76</td>
<td>-2.44</td>
<td>-2.50</td>
</tr>
<tr>
<td>4. Base 3 &amp; fertility rate of 2.2</td>
<td>-0.15</td>
<td>-1.63</td>
<td>-1.72</td>
</tr>
<tr>
<td>5. Base 3 &amp; real wage of 1.4%</td>
<td>-0.20</td>
<td>-1.75</td>
<td>-1.85</td>
</tr>
</tbody>
</table>

A 4th alternative: later retirement

• Congress has already extended “full” retirement age to 67 for those born 1960 and later.
• No reason to stop there.
• Retirement at about 69 in 2050 would maintain the division of average life between work and retirement (compared to 1965).

1. The trust fund

• It can be argued that SS has been run more responsibly than the rest of the Federal budget.
  – The government focuses on the “unified budget” in which the surplus run by social security is used to offset the deficit run in the rest of the government.
  – The “crisis” in social security occurs only if one assumes that there is a firewall between social security funds and the rest of the government.
  – Once one admits that the firewall is a fiction, the notion of a SS funding crisis is also seen to be a fiction.
  – There can be a general budget crisis, but not a SS funding crisis.
2. Rates of return on private accounts

- “Privatizers” seem to think that they will always be that high, which is unlikely.
- In fact price-earnings ratio, that averaged 14 over many years, is now 20.
- The P/E ratio is roughly the inverse of the rate of return, so this means that the rate of return has fallen from about 7% to 5%.
- Prescott agrees that equity premium puzzle has now vanished — i.e., higher return is just enough to compensate for higher risk.

2. Rates of return on private accounts

- Need to account for mix of stocks (60% of account at 5%) and bonds (40% of account at 2%)
  - Reduces rate of return to 3.8%
- Management fees
  - In Britain, 1.1%.
  - Reduces rate of return to 2.7%.
  - Barely above social security return
    - With a lot more risk.

3. The Distant Future

- Further Krugman objections:
  i. Most of projected future deficits are for Medicare, for medical procedures not yet developed, to be applied to people not yet born. We don’t need to finance that starting today.
  ii. Social security losses also are projected to be high 100 years in the future. But we don’t know what the economy will be like that far in future. No justification to project beyond the 75-year window that SS has always used.
  iii. Can we really count on future changes in benefits to offset the required borrowing today? No, because today’s government cannot bind future governments. The extra debt will have been created, but no guarantee that the savings will be forthcoming.

Krugman summary

- Argues that the current drive to privatize is simply the attempt of right-wing to do away with a government program that they have never liked.
- Why would any economist support it?
  - some competent, politically conservative economists support it for 1 of 2 reasons:
    1. they hope to get administration appointments or
    2. they think that the current saving rate is too low in the US, and this plan might be shaped into one that would increase national saving.
  - Krugman argues that based on past, this is unlikely.
7. Lazear, The virtues of personal accounts

- Real issue is not whether private accounts would give greater returns. Real issue is what should goals of system be, and would private accounts achieve desired goals more efficiently?

a. 3 Functions of Current Social Security System

i. Forces savings, because some would put aside less than social security requires.

ii. Provides insurance, pooling risks across individuals and making benefits independent of return to securities.

iii. Redistributes income.

7. Lazear, The virtues of personal accounts

b. Which Functions of the SS System Are Proper?

i. Forced saving is at the heart of the system, so that everyone will have some basic standard of living throughout retirement.

ii. Implicit in the notion of a base level of income for all is desire for insurance, putting a floor under amount of benefits.

iii. The redistribution feature of social security is more problematic; some is capricious.

7. Lazear, The virtues of personal accounts

c. Some Initial Advantages of Private Accounts

i. Consistent with fundamental economic principles – consumer sovereignty, and keep market free of big distortions.

ii. Private accounts enhance likelihood that contributors will receive what they expect. Benefits are more secure (not changeable by Congress).

iii. Removes temptation from Congress to spend revenues that are collected from social security taxes (via the device of the unified budget).

7. Lazear, The virtues of personal accounts

• Can Private Accounts Serve the Proper Goals of the Soc. Sec. System?

i. Primary goal is to force individuals to save.

- Private accounts do this,

- with additional advantage of allowing consumer sovereignty, especially for those who would not save much on their own,

- with more security, since return isn’t subject to whim of Congress.

ii. Income insurance:

- We can supplement private accounts with a base level of pension from a government-funded program.

- Or could guarantee a minimum return or a minimum annuity for those who had put aside the funds as required.

Income redistribution from Soc. Sec.

- Those with shorter life expectancies transfer income to those with longer life expectancies

  - blacks to whites

  - men to women,

  - smokers to non-smokers.

  - Caps on benefits mean that incomes are transferred from rich to poor

  - caps on contributions mean that income is redistributed from middle class to rich.

Income guarantee to provide insurance:

- Would require regulation of the kind of investments

  - because the guarantee would encourage very risky investments:

  - if you win, you win, and if you lose, the government picks up the tab for you.
7. Lazear, The virtues of personal accounts

e. **The Transition to Private Accounts**

- Argues that the cost would not be great, but he does not back up the assertion with numbers.
- I have not seen any calculations that support Lazear’s conclusion that the cost would be relatively low.