LECTURE: SOCIAL INSURANCE

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EC230

OUTLINE OF LECTURE:

1. Introduction and definitions
2. Justification for Government Involvement
3. Optimal benefits (UI)
Social Insurance
Features of social insurance programs
-- Compulsory (yes)
-- Contributory (payroll taxes)
-- Provides benefits triggered by an event (old age, disability, unemployment, death, workplace injury)
-- Eligibility is tied to prior labor market experience (yes)
-- Benefits tied to previous labor market experience (yes)

For reference, this is in contrast to public assistance programs where
-- Compulsory (no), contributory (no), eligibility limited by prior labor market choices (no), benefits related to prior labor market choices (no)
-- means tested (yes)

Motivation for social insurance: program to provide for insurance against shocks to income.
Facts about social insurance (2005) (Federal outlays = 20% GDP)
Total federal outlays $2472 billion
Total federal outlays, distribution
Medicare 12%
Social Security 21%
National defense 20%
Interest 7%

Figure 1.1: Social Insurance Benefits as a Percent of Federal Government Expenditures

Table 1.1
Social Insurance Spending, 1996

<table>
<thead>
<tr>
<th>Country</th>
<th>Percent of GDP</th>
<th>Percent of Central Govt Expenditures</th>
<th>Percent of Total Govt Expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>32.47</td>
<td>86.80</td>
<td>49.58</td>
</tr>
<tr>
<td>Germany</td>
<td>28.05</td>
<td>82.91</td>
<td>49.44</td>
</tr>
<tr>
<td>Mexico</td>
<td>1.355</td>
<td>8.82</td>
<td>6.39</td>
</tr>
<tr>
<td>Columbia</td>
<td>6.81</td>
<td>43.33</td>
<td>NA</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>17.53</td>
<td>43.13</td>
<td>33.77</td>
</tr>
<tr>
<td>United States</td>
<td>12.22</td>
<td>59.76</td>
<td>30.02</td>
</tr>
<tr>
<td>Japan</td>
<td>2.50</td>
<td>19.44</td>
<td>16.00</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>11.89</td>
<td>38.90</td>
<td>26.75</td>
</tr>
</tbody>
</table>

Krueger and Meyer 2002.
Questions in social insurance:

1. Justification for social insurance
   Why insurance? Why social?

2. Optimal social insurance (how much to have given that we have it)

Trade off between protection and distortion

- **Protection**: benefits of program are to reduce fluctuations in consumption (protect against poverty and reductions in standard of living)

- **Distortion**: changes in incentives for workers and firms that lead to inefficient outcomes and deadweight loss. Moral hazard.

Empirical literature examines both protection and distortion.
Justification for Governmental Intervention in Social Insurance:

Why insurance?
   Individuals are risk averse, prefer to smooth consumption
   They benefit from actuarially fair insurance

<table>
<thead>
<tr>
<th>Social insurance program</th>
<th>Insures against</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Security</td>
<td>Old age (earnings capacity)</td>
</tr>
<tr>
<td>Disability Insurance</td>
<td>Disability</td>
</tr>
<tr>
<td>Unemployment Insurance</td>
<td>Involuntary unemployment</td>
</tr>
<tr>
<td>Worker’s Compensation</td>
<td>Work based injury</td>
</tr>
<tr>
<td>Medicare</td>
<td>Health shock</td>
</tr>
</tbody>
</table>

Why government intervention and provision of these programs?
   What is the market failure?
Reasons for government intervention in social insurance

1. Adverse selection, informational problems, incomplete insurance markets
   Rothschild and Stiglitz 1976

2. Individual optimization failures (paternalism?)
   Myopia, self control, improper planning
   Role of information?
   Ex: Consumption falls “too much” at retirement
   Banks, Blundell, and Tanner (1998)
   Bernheim, Skinner, and Weinberg (2001)
   Ex: People do not save “enough”
   Scholz et al JPE 2006

3. Macro shocks

4. Redistribution based on lifetime earnings (rather than current year income)
Adverse Selection

Basic result:
If we have asymmetric information (insurer does not know your type) then there
is a market failure (incomplete insurance). Government can create pareto
improvement because of mandatory participation.

We can think of this model to justify government intervention for any social
insurance program. But here, let’s consider it with unemployment insurance.

Model:
[static one period model, no savings, can not tell who is which type]

2 types of people,
Fraction $f$ are high risk of unemployment (H)
Fraction $1-f$ are low risk of unemployment (L)

Income $w$ for both types if employed, 0 if unemployed $(w,0)$
$p_H > p_L$ probability of becoming unemployed
(Note: no distortion, labor supply is fixed)
Insurance contract is \( \alpha = (\alpha_1, \alpha_2) \)
- Pay \( \alpha_1 \) if employed
- Receive \( \alpha_2 \) if unemployed

Consumption with insurance contract then becomes \((w - \alpha_1, \alpha_2)\)

Expected utility \( V_i(\alpha) = (1 - p_i)u(w - \alpha_1) + p_i u(\alpha_2) \)

Equilibrium = set of insurance contracts such that both types cannot find a better contract than the one they chose and all insurance providers are earning zero profits.

Consider pooling equilibrium (one policy for both), and separating equilibrium (H guys choose \( \alpha_H \) and L guys choose \( \alpha_L \))
Full information, every one equal

Full insurance
Earn expected income $(1-p)w$ in each state
Pooling equilibrium
No pooling equilibrium exists
If high and low types are offered the same contract, then low types will be charged an unfairly high premium to be insured.

Zero profit condition requires that $\alpha_2 = \frac{1 - \bar{p}}{\bar{p}} \alpha_1$ where $\bar{p}$ is average risk of being employed. But since $\bar{p} > p_L$, then L is paying too much.

$\alpha$ is the proposed pooling equilibrium with zero profit.

But firm can offer $\beta$ which L prefers

It follows that a firm can make a positive profit and equilibrium breaks down
Separating Equilibrium
Here, we can get full insurance for H but underinsurance for L.
H can get full insurance because the L guys will never try to get it (and if they do it only raises profits for firm)
L is underinsured because if full-insurance then H will want this insurance and this will create negative profits.
Have to set L premium low enough so that H will not want it.

H fully insured at $\alpha^H$

L would prefer full insurance at $\beta$. But H would like that too. $\Rightarrow$ neg profit

Best pooling eq is $\alpha^L, \alpha^H$

Incomplete insurance for L
But, someone could come in and offer $\gamma$ which can draw L and H away from pooling. Then this fails.
Government intervention:
Key is that they mandate participation. No one can opt out. Government can find a program that is a pareto improvement over the separating equilibrium.
One possibility is $\gamma$ from above.

Both L and H better off then separating eq.
L are still not fully insured.

If there are relatively few H guys then low risk guys benefit from pooling with them.

(But as above this will not work in private market because someone will try to enter and steal the L guys away leading to a “death” spiral.)
Individual Optimization Failures

People should self insure against these shocks. But they do not seem to be doing so at an adequate level.

Clearly if people misperceive the risk of unemployment (or other SI shock) then mandatory government program can help.

Still undeveloped area, but growing: behavioral public finance

Macro or aggregate risk

Insurance firms want to diversify risk so that in any given period L can payoff H
-- Unemployment is clear macro risk, hard to diversity
-- “old age” risk can be thought of as demographic swings (baby boom)
-- less relevant for disability and worker’s comp where the risks are more idiosyncratic
Optimal social insurance

In Rothschild & Stiglitz, we have that perfect insurance is optimal. But that is all about protection and ignores distortion.

Distortion—if you are perfectly insured then you will never work.

So to get optimal social insurance we have to balance protection with moral hazard.

Growing research area.

We will focus on optimal insurance in case of unemployment insurance.

First a bit of background on unemployment insurance.
Unemployment Insurance, Overview

Started 1935 (social security act)
State provided

Benefits:
-- Replacement rate about 50% of pre-unemployment wages (but varies a lot across states), is subject to min and max benefit
-- Duration of benefits 26 weeks (most states), can be extended by federal government by another 13 weeks. (median spell duration is 2 months)

Eligibility
-- “covered” employment about 97% of workforce in eligibly jobs
-- must satisfy work history requirements (# weeks at job, high enough wage/earnings)
-- not eligible if: voluntary separation (quit), misconduct (fired), not “able” to work (disabled)
-- typical eligibility: work 2 out of last 4 quarters
-- have to be “looking for work”
Takeup:
-- not automatic
-- only about \( \frac{1}{2} \) to \( \frac{2}{3} \) of eligibly unemployed takeup benefits

Financing:
- financed by employed based taxes
- “Experience rated” tax system
  - tax rate applied to each individual firm is related to previous benefits collected by previous employees of the firm
  - Implies that there is a cost to laying off a worker (increases future taxes)
  - US is only country in the world that experience rates unemployment taxes
  - lessens moral hazard problems on firm side
- Firm tax rate is a \( f(\text{acct balance}/\text{total payroll}) \), subject to min and max rates
  - Acct balance = taxes paid by firm – benefits paid to laid off workers

System is imperfect experience rated (pdv future taxes < pdv UI benefits) due to min/ max tax rate, no interest charged, etc.
Optimal UI Benefits

Possible distortions in UI
- Longer unemployment durations
- Greater use of jobs with high unemployment risk (landscaper in Wisconsin)
- Greater shirking (risk of job loss less severe)
- Less savings

Protection in UI
- Smoother path of consumption

Baily JPUBE 1978: did seminal work on this
Chetty JPUBE 2006: updates Baily
Baily’s model:
-- all workers are identical
-- firm perfect experience rating (no distortions to firm behavior)
-- two periods: work in period 1, some unemployment risk in period 2
-- utility is function only of consumption (so when unemp still active labor market policy so little leisure)
-- fixed probability of job loss

Chetty’s extension of Baily still maintains the following:
-- partial equilibrium (no GE effects on wages)
-- no externalities in search (no crowdout)
-- no distortions to firm behavior (layoffs)
Basic Baily model:

Representative agent comes to period 0 with assets $A_0$
Faces risk of job loss of probability $p$, earnings are $w$ or 0
If unemployed, must search for job
Can control unemployment duration $D$ by varying search effort
$\Psi(D)$ concave, increasing function: captures leisure value of unemp, benefits of improving job match with search
Budget constraint has to hold within each state
UI: tax rate while working of $\tau$, benefit while unemployed is $b$
$c_e$, $c_u$: consumption in employed and unemployed states
Individual’s maximization problem:

\[ \text{Max}(1 - p)u(c_e) + p\{u(c_u) + \Psi(D)\} \]

s.t. \( A_0 + (w - \tau) - c_e \geq 0 \)

\[ A_0 + bD + w(1 - D) - c_u \geq 0 \]

Gives the value function as a function of \( b \): \( V(b) \)

Social Planner’s problem is to choose \( b \) that maximizes agent’s utility while satisfying balanced budget constraint:

\[ \max_b V(b) \quad s.t. \quad (1 - p)\tau = pbD \]

(same structure as optimal tax problem)
Solution:

Optimal benefit $b^*$ is implicitly defined by:

$$\gamma \frac{\Delta c}{c} (b^*) \approx \varepsilon_{D,b}$$

$$\frac{\Delta c}{c} = \frac{c_e - c_u}{c_e} = \text{change in consumption with unemployment (protection)}$$

$$\gamma = -\frac{u''(c_e)}{u'(c_e)} c_e = \text{coefficient of relative risk aversion (value of greater smoothness)}$$

$$\varepsilon_{D,b} = \frac{d \log D}{d \log b} = \text{elasticity of duration wrt benefits (distortion)}$$

(marginal social benefit of search equal to MSC of search)

Empirical literature focuses on estimating these parameters. Least amount of work on risk aversion.
Many people have extended Baily’s model and further explored the implications for optimal benefits:

Chetty JPUBE 2006 derives a model that yields a reduced form expression for optimal benefits as a function of the estimable elasticities.

- shows that Baily expression for optimal benefit level apply more generally then previously thought (depends on three critical parameters)
- results hold under borrowing constraints, endogenous spousal labor supply, leisure benefits of unemployment
- makes the point that the optimal benefit formula has parameters given current UI system, capturing the direct and indirect channels
  - EX: $\varepsilon_{D,b}$ captures full effect of b on D. So if a higher b means less private savings which feeds back into D.
- further this means that the formula is the same for a richer model (e.g. bringing in leisure).
  - Greater leisure value raises $b^*$ through $\Delta c/c$ (greater leisure value means willing to tolerate a greater fall in c \rightarrow higher $b^*$). But conditional on knowing $\Delta c/c$ and $\varepsilon$, then leisure has no additional value in optimal tax formula because they are already taken into account in agent formula.