14.472 Public Finance II
Social Insurance and Redistribution

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Spring 2019
Outline of (26) Lectures

1. Why have Social Insurance (~1)
2. Empirical analysis of Private Insurance Markets I: Adverse Selection and Behavioral Biases (~7)
3. Empirical analysis of Private Insurance Markets II: Moral hazard (~3)
   - Application: Health insurance
4. Optimal Provision of Social Insurance Benefits (~3)
   - Application: Unemployment Insurance
5. Tagging and Social Insurance (~2)
   - Application: Disability Insurance
6. Redistribution (~6)
   - Part I: Theories of redistribution
   - Part II: In-kind transfers
   - Part III: Take-up and self-targeting
   - Part IV: Valuing public health insurance subsidies
7. Choice of Instrument (~2)
8. Social Security (~2)
Course mechanics

- Reading list
  - Read a small number of papers carefully
    - **For maximal learning: read the bolded papers before class**
    - Read actively / critically.
    - Keep a list of research ideas that occur to you!
  - Additional listing hopefully a useful reference when a topic sparks your interest

- Strongly recommended
  - Attend public finance lunch (Mondays 12 – 1)
  - Attend applied micro seminar (Mondays 4 – 5:30)
Will cover some essential topics that I will assume knowledge of
  e.g. this week will cover Rothschild-Stiglitz model (emphasizing its public finance implications)
  e.g. in subsequent section will provide an overview of crucial institutional details that will be relevant for understanding key papers

Will also cover (as needed / useful):
  Review (or introduction) of techniques that I assume knowledge of in class
  Sorting out confusions I introduce in class

Attendence strongly advised (if time conflicts with another section we can re-optimize)
Course Requirements

- Class participation (cold calling)
- Written response papers (almost one per class)
- Two problem sets
- Research proposal
  - Pose a question motivated by class and a randomized evaluation that could answer it
  - Will have section(s) to discuss aspects of design of randomized evaluation
- Final exam (closed book, 3 hours)
Assignment: Provide two "big picture" comments on the assigned paper
- At least one must at least attempt to be constructive
- No more than 1 page (double spaced).
- Due: HARD COPY with your name outside my office by 9am
  - Feel free to coordinate
- Due next class: Finkelstein and McGarry (AER 2006)
Written comments

- Assignment: "Big picture" comments
- Examples:
  - Suggestions for future research
  - Important question related to paper that paper does not address or leave unanswered
  - Alternative interpretation for paper’s findings
  - Major substantive concern with analysis (ideally with suggestions for investigating / addressing)

- What is the objective?
  - Ensure you read paper carefully so we can have a more informed discussion in class
  - Get you to think actively, critically, and constructively about research

- If you have specific / narrow questions / concerns about paper please write them down and bring them up in class when we discuss the paper
(Some) course goals

- Key economic / conceptual issues in social insurance and redistribution
- (Some of the) highlights of (some of the) literature
  - (Some of) what we know
  - Will also try to highlight what we don’t know (i.e. good research topics!)
- Exposure to a range of empirical techniques
  - Including: RCTs, "reduced form" quasi-experimental work; sufficient statistics; "structural estimation"; calibrated life cycle models
- Key theme: complementarities
  - between theory and empirics
  - across empirical approaches
Institutional background

- Will spend minimal time on key institutional details
  - Not an efficient use of limited class time
  - Have tried to focus course around economic issues rather than programs per se
    - In practice a given economic issue has often been studied in the context of a particular program
    - Good strategy for students: can you apply these ideas / tools to a different program?
- A deep understanding of institutional details essential for own research
  - You should also familiarize yourself with the basics on any topic we are discussing
  - Section will cover some of these
  - Good sources (listed on syllabus)
    - For general orientation: Gruber textbook
    - For more details: Moffit 2016
Topic 1: Why have Social Insurance?

1. General background:
   - What is Social Insurance?
   - Potential Rationales for Social Insurance
   - What can government do?
   - Should government intervene?

2. Adverse selection
   - Reading: Einav and Finkelstein (JEP 2011)
What is insurance?

- Insurance transfers resources from states of the world with low marginal utility of consumption to those with high MU of consumption
  - Goal: equate (smooth) marginal utility of consumption across states of the world
  - States of world: e.g. sick vs. healthy; car accident vs. not
- Key point: risk averse individual prefers to pay $10 for sure than face a one in ten thousand risk of having to pay $100,000
  - By pooling idiosyncratic risk, can make everyone better off
Insurance: A Free Lunch!

\[ \pi = \text{risk premium} \]
\[ \pi \text{ satisfies } U(y-\pi) = E[U(y)] \]
What is Social Insurance?

- Government intervention in provision of insurance
  - E.g.: unemployment, disability, health
  - Motivation: insurance against shocks to individual
    - Consumption smoothing value to risk averse individuals (recall graph: free lunch!!)
  - vs. Means-tested redistribution based on “permanent” differences
    - E.g. Cash welfare, food stamps, public housing etc
    - Can think of this as insurance behind the veil of ignorance
    - NB: Some programs involve both insurance and redistribution (e.g. SS)
The changing function of government

**FIGURE 12-1**

**Government Spending by Function, 1953 and 2014**

Government today devotes a much larger portion of its budget to social insurance than it did 50 years ago.

Data from: Office of Budget and Management (2014); Bureau of Economic Analysis, nIPA Table 3.16.
Social Insurance: The changing function of government

- SI share of federal expenditures has increased from ~9% (1953) to ~55% (2014)
- “Loosely speaking, the post-cold-war federal government is a big pension fund that also happens to have an army” (Krugman 2001)
Federal Outlays by Major Category 2017

- Social Security: 22%
- Medicare: 17%
- Medicaid: 8.8%
- Defense: 14%
- Net Interest: 6.2%
- Other: 32%

Source: CBO 2018
Share of Federal Spending (Projected for 2048)

- Social Security: 21%
- Medicare: 20%
- Medicaid, CHIP, and Marketplace Subsidies: 20%
- Other: 11%
- Net Interest: 26%

Source: CBO 2018
## Main Social Insurance Programs in the US

<table>
<thead>
<tr>
<th>Program</th>
<th>People Receiving Benefits (Millions)</th>
<th>Annual Federal Spending (Billion $)</th>
<th>Year</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Care</td>
<td></td>
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<tr>
<td>Medicare</td>
<td>57</td>
<td>583</td>
<td>2016</td>
<td>HHS 2016 budget-in-brief</td>
</tr>
<tr>
<td>Medicaid</td>
<td>72.6</td>
<td>344</td>
<td>2016</td>
<td>HHS 2016 budget-in-brief</td>
</tr>
<tr>
<td>Old Age Assistance</td>
<td>50</td>
<td>765.6</td>
<td>2016</td>
<td>SSA monthly statistical snapshot, June 2016</td>
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<tr>
<td>Workplace Insurance</td>
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<td></td>
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</tr>
<tr>
<td>Unemployment Compensation</td>
<td>?</td>
<td>32.3</td>
<td>2016</td>
<td>Congressional Research Service Report 33362</td>
</tr>
<tr>
<td>Workers Compensation</td>
<td>?</td>
<td>61.9</td>
<td>2015</td>
<td>Congressional Research Service Report 44580</td>
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<tr>
<td>Disability Insurance</td>
<td>10.7</td>
<td>132</td>
<td>2016</td>
<td>SSA monthly statistical snapshot, June 2016</td>
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<tr>
<td>EITC</td>
<td>62.9</td>
<td>54.9</td>
<td>2012</td>
<td>Congressional Research Service Report 44327</td>
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<tr>
<td>Welfare</td>
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<tr>
<td>SSI</td>
<td>8.3</td>
<td>56.4</td>
<td>2016</td>
<td>SSA monthly statistical snapshot, June 2016</td>
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<tr>
<td>TANF</td>
<td>5.8</td>
<td>6.7</td>
<td>2012</td>
<td>Congressional Research Service Report 44327</td>
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<tr>
<td>SNAP</td>
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<td>77.8</td>
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<td>7.2</td>
<td>2012</td>
<td>Congressional Research Service Report 44327</td>
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<tr>
<td>Housing Assistance</td>
<td>10.8</td>
<td>33.4</td>
<td>2012</td>
<td>Congressional Research Service Report 44327</td>
</tr>
</tbody>
</table>
Main Social Insurance Programs in US

Prior slide gives (crude) sense of relative magnitudes (in terms of $ and beneficiaries) of different programs (c. 2016)

- Note: actual “beneficiaries” exceed those who receive benefits ex post (insurance value ex ante)

In terms of $ and people, Old Age Assistance and Medical Insurance dominate

In terms of insurance value?

- Insurance value is about variance, not mean
- Have seen individual studies on value of e.g. ui or hi.
- No comprehensive (or even comparative) look at where marginal value of $ is highest
Choice of Instrument

- SI takes many different forms:
  - Public provision of insurance (Medicare, Social Security, UI)
  - Mandate that firms provide insurance (Worker’s Comp)
  - Subsidize / Regulate private insurance markets
    - Tax subsidy to employer provided health insurance
    - Regulate pricing and contracts in non group health insurance

- Choice of Instrument = understudied question
  - Conditional on intervention, what form should it take?
  - {Pay attention to the dog that didn’t bark}
Rationales for social insurance

Thus far: insurance can be very valuable and government is very involved

Now: why would government be involved?

1. Private market failures
2. Redistribution
3. Individual failures of rationality / optimization
4. Paternalism
Private market failures

- Imperfect competition [go take IO]
- Asymmetric Information
- Aggregate Shocks
- Externalties
Asymmetric Information

- Adverse selection (will discuss in detail!).
  - My favorite private market failure

- Moral hazard
  - Behavioral response to contracts
  - In general not something the government has a comparative advantage in addressing.

- Aggregate shocks
  - Economic downturn (UI), natural disasters
  - Private insurance markets can diversify idiosyncratic risk cross sectionally but if want to smooth intergenerationally, government may have comparative advantage.
    - Relatively little work here.
Aggregate Shocks

- Economic downturn (UI), natural disasters, terrorist attacks
- Private insurance markets can diversify idiosyncratic risk cross-sectionally but if want to smooth intergenerationally, government may have comparative advantage.
  - Or perhaps the capital markets ("act of god" bonds)
  - Relatively little work here.
Externalities

- Physical (infectious disease)
- Other real externalities (e.g. jointness in production, medical ethics etc)
- Good Samaritan’s problem
  - Samaritan’s dilemma (Buchanan 1975; Coate 1995): we can’t commit not to take care of people in certain circumstances, which will distort their private choices (e.g. food pantries; hospital charity care)
- Note: Traditionally, externalities have gotten relatively little attention in social insurance
  - But are potentially important in some contexts
  - Will return to later in course / a great area for work
Redistribution

- Redistribution: Argument of Akerlofian tag: lifetime earnings (SS), health (medicare) since poor are sicker etc.

- Do we want this type of redistribution (i.e. from losers to winners)?

- Is this the most efficient way to do redistribution (vs. e.g. redistributive taxation)
  - Will discuss Hendren’s "Marginal Value of Public Funds"

- Potentially a form of ex-ante insurance

- Note many models of redistribution share features w models of asymmetric information / adverse selection (e.g. Diamond-Mirlees and other screening models)
Behavioral Biases

- **In purchasing insurance**
  - Overconfidence / don’t understand probabilities (young think they’re invincible)
  - Overweight low probability events (buy flight insurance)
  - “Mistakes” – Medicare part D

- **In consumption decisions**
  - e.g. Myopia / under-investment in preventive care
Paternalism

- Social planner wants to encourage behavior individuals would not choose
- Merit goods (Musgrave 1959): Want to encourage consumption of particular goods
  - Consumption of that particular good enters SWF not through individual utilities
- "Consumption Externalities"
  - My utility depends on your consumption
What can government do?

- Power to change prices (tax/ subsidize)
- Power to mandate (regulate)
  - Purchase
  - Offerings
Should government intervene?

- Theoretical possibility of market failure per se does not tell us if or how govt should intervene
  - Enter empirical work
- Empirical questions for any given insurance market / social insurance program:
  - Is there a market failure?
  - What is the magnitude of its efficiency costs?
  - What is the optimal policy intervention? (choice of instrument)
  - How large is welfare gain from optimal policy intervention?
  - What are costs from policy intervention (vs. benefits)?
Empirical questions for any given insurance market / social insurance program:

- Is there a market failure?
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- What is the optimal policy intervention? (choice of instrument)
- How large is welfare gain from optimal policy intervention?
- What are costs from policy intervention (vs. benefits)?

We are going to work through this empirical list for the particular rationale of adverse selection

But first, we need to be clear on the theory...
Recall “free lunch” appeal of insurance:
- By pooling idiosyncratic risk, can make everyone better off
- Prefer to pay $10 for sure than face a one in ten thousand risk of having to pay $100,000

But this pooling mechanism may not work if individuals have private information about risk type:
- Risk type: chance become sick, lose job, die etc
- High risk come into the market and drive up prices for low risk
- Possible result: no one buys insurance even if for each person benefit of having insurance is greater than the cost of providing it to that person
- Suggests possible welfare-improving role for mandates
Adverse selection

- **Key points**
  - Welfare gain to risk averse individuals from being able to buy actuarially fair insurance
  - Market failure: private information about risk type $\rightarrow$ may not be able to buy actuarially fair insurance $\rightarrow$ may have under-insurance
  - Potential scope for welfare improving government intervention
Adverse selection

- Classic theory: Akerlof (1970); Rothschild and Stiglitz (1976)
- Today: sketch a simplified graphical theoretical framework
  - To illustrate under-insurance and welfare loss that can arise with private information about health
  - To illustrate tradeoffs involved with potential government interventions (e.g. mandates)
- Up next: Take framework to data to:
  - Test for existence of adverse selection
  - Quantify resultant welfare loss
  - Assess welfare consequences of alternative policy interventions
- Overview follows Einav and Finkelstein (JEP 2011)
  - Will use health insurance as concrete example but naturally applies to any insurance
Setup - Textbook case

- Perfectly competitive, risk neutral firms offer a single health insurance product that covers you if you get sick
  - Consumer choice: buy or not buy the contract
  - Important assumption: fixing contract space (Akerlof vs. Rothschild and Stiglitz)
- Risk averse individuals identical except for their (privately known) probability of getting sick
  - NB: Growing empirical evidence on importance of heterogeneity in preferences (as well as risk).
    - Can create opposite results (advantageous vs adverse selection with over- vs under-insurance).
    - Empirically relevant (e.g. long term care insurance; Medigap)
  - Will come back to this...
- No additional frictions (e.g. administrative costs)
  - so firms’ (and social) costs of providing insurance are expected insurance claims, that is expected payouts on policies
  - Will relax later in lecture...
Given this setup, what drives demand?

- {Note: unit demand. so "quantity" is share of population who purchases}
- Because individuals identical except for probability of getting sick, individuals with higher probability of getting sick have higher demand (wtp) for insurance

Implication: downward sloping marginal cost curve

- Individuals with highest willingness to pay have highest expected costs
- Link between demand and cost curve is distinguishing feature of selection markets: production costs depend on which consumers purchase your product
Adverse selection: under-insurance

Demand curve

Price

Quantity

$Q_{\text{max}} = 1$
Adverse selection: under-insurance

![Diagram showing Adverse selection: under-insurance](image)

- **Demand curve**
  - The demand curve illustrates the relationship between price and quantity demanded, indicating that as price increases, the quantity demanded decreases.
- **MC curve**
  - The MC curve shows the marginal cost of producing each additional unit of the good or service. The sickest individuals have the highest willingness to pay.
- **Risk premium**
  - The risk premium is the additional amount that individuals with higher risk (such as the sickest individuals) are willing to pay for insurance or coverage.
Adverse selection: under-insurance
Adverse selection: under-insurance

```
\begin{align*}
\text{Demand curve} & \quad \text{MC curve} \\
\text{MC curve} & \quad \text{AC curve}
\end{align*}
```
Can get complete unraveling

\[ Q_{max} = Q_{eff} = 1 \]
Mandates as possible solution

Demand curve
AC curve
MC curve

Price

Quantity

$P_{eqm}$

$Q_{eqm}$

$Q_{eff}$
Mandates as possible solution

Note: everyone not better off (some value at $< P_{\text{mandate}}$)

Demand curve
AC curve
MC curve

$P_{\text{eqm}}$
$P_{\text{mandate}}$
$Q_{\text{eqm}}$
$Q_{\text{eff}}$
Potential public policy solutions

- Assume government has no better information than firm
- Comparative advantage of government is to manipulate price (tax/subsidies) or manipulate quantity (mandate)
- Subsidize insurance
  - Unambiguous welfare gain (until you consider the cost of public funds or as we will discuss it the "fiscal externalities" of the policy (Hendren 2016))
- Mandate coverage
  - Can achieve efficient outcome (mandate $Q_{mandate} = Q_{max} = Q_{eff}$)
  - Unambiguous welfare gain; magnitude uncertain
  - Note: *No Pareto Improvement* - some will be made worse off by mandate
    - Useful in understanding ’08 Obama-Clinton primary debates...
    - But also model specific (e.g. potential Pareto improving policies in Rothschild-Stiglitz)
Why might it not be efficient to insure everyone (i.e. why might MC be above WTP for some individuals?) Assuming everyone is risk averse...

- Loading factors on insurance (administrative costs)
- [Profits – not yet introduced in model]
- Horizontal product differentiation (HMO vs PPO trades off lower oop costs but with more restrictions on doctor's choice)
- [Moral hazard - not yet introduced in model]

With these, everyone may not value insurance at \( > \) MC of providing it to them

What if it is not efficient for everyone to buy insurance?

- No longer unambiguous welfare gain from mandate
- Tradeoff between two allocative inefficiencies: under-insurance from adverse selection vs. over-insurance from mandate
  - And this is still without allowing for preference heterogeneity! That introduces further sources of ambiguity...
Adverse selection with loads

Price

MC curve

AC curve

Demand curve

$P_{eqm}$

$P_{eff}$

$Q_{eqm}$

$Q_{eff}$

$Q_{max}$

May not be efficient to insure all

Finkelstein ()

PF Slides

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Individuals may differ not only in their risk type but also their preferences (e.g. risk aversion / willingness to bear risk)

- WTP increasing in risk aversion and in risk

Creates potential for advantageous selection (opposite results of adverse selection)

If high-risk individuals are less risk averse and heterogeneity in risk aversion is large, can get upward sloping marginal (and therefore average) cost curve

- Individuals with highest WTP are the most risk averse and lowest (vs. highest) expected cost
Advantageous selection

Liran Einav and Amy Finkelstein

If the AC curve were upward sloping, the AC curve will lie everywhere below it. If there were no insurance loads (as in the textbook situation), advantageous selection would not lead to any inefficiency; the MC and AC curves would always lie below the demand curve, and in equilibrium all individuals in the market would be covered, which would be efficient.

With insurance loads, however, advantageous selection generates the mirror image of the adverse selection case, also leading to inefficiency, but this time due to over-insurance rather than under-insurance. Figure 4 depicts this case. The efficient allocation calls for providing insurance to all individuals whose expected cost is lower than their willingness to pay—that is, all those who are to the left of point E (where the MC curve intersects the demand curve) in Figure 4. Competitive equilibrium, as before, is determined by the intersection of the AC curve and the demand curve (point C in Figure 4). But since the AC curve now lies below the MC curve, equilibrium implies that too many individuals are provided insurance, leading to over-insurance: there are $Q_{eqm} - Q_{eff}$ individuals who are inefficiently provided insurance in equilibrium. These individuals value the insurance at less than their expected costs, but competitive forces make firms reduce the price, thus attracting these individuals together with more profitable infra-marginal individuals. Again, the area of the deadweight loss triangle EDC quantifies the extent of the welfare loss from this over-insurance.

Figure 4

Advantageous Selection

Advantageous selection

- Over-insurance
  - Opposite problem from adverse selection
- Opposite policy solutions
  - e.g. tax (vs. subsidize) insurance
Ultimately these are empirical questions (to be covered in next few lectures)

- Does adverse selection exist?
  - i.e. is marginal cost curve downward sloping? As you raise the price, is the marginal guy who drops out lower risk than the average guy who remains?
- How large is the welfare loss from adverse selection?
- What are the net welfare effects of various government interventions
Should government intervene (Redux)

- Is there adverse selection?
- How large is the efficiency cost of the adverse selection?
- What is the optimal policy intervention? (choice of instrument)
- How large is welfare gain from optimal policy intervention?
- What are costs from policy intervention (vs. benefits)?

Can think of above as an empirical checklist...

- Will cover above in Section II
- Does government intervene optimally
  - Political economy...
What about moral hazard?

- Unobserved effort taken by agent in response to insurance contract
- Drives wedge between private and social cost
- Classic tradeoff of insurance vs. incentives
- Cost of insurance (not of social insurance / govt intervention)
- Will cover in Sections III and IV
Summary

- Exciting aspect of social insurance: potential for government to improve efficiency
  - Address market failures of adverse selection
  - Comparative advantage over private sector:
    - Power to tax
    - Power of compulsion

- Potential costs to social insurance:
  - Most attention: moral hazard
    - NB: cost of insurance generally, not social insurance in particular
  - Productive efficiency
    - Marginal cost of public funds
    - Administrative costs (compare to private provision?)
    - Productivity
  - Allocative efficiency
  - Non-optimal policy selection
    - Level or form (provide, mandate, regulate etc.)
Up next

- How do we empirically detect asymmetric information
- Welfare cost of asymmetric information
- Welfare consequences of government intervention