

Public Economics for Public Policy
Part V: Social Insurance

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Sciences Po

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Social Insurance: Adverse Selection and Moral Hazard

An illustration: Health Insurance

Social Insurance: Adverse Selection and Moral Hazard

Insurance is payment of premium to get payment in case of adverse event (e.g., auto insurance)

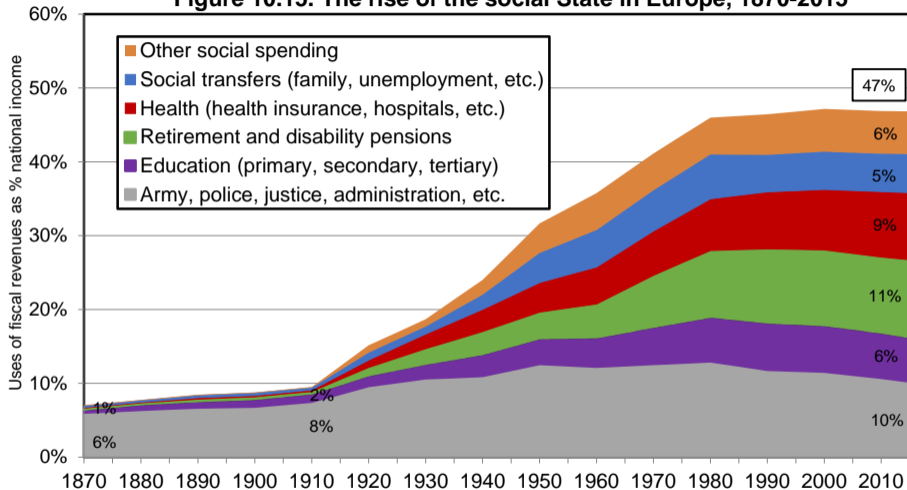
Social insurance programs: Government provided insurance against adverse events funded by taxation:

1. health insurance (Medicaid, Medicare, Obamacare)
2. retirement and disability insurance (Social Security),
3. unemployment insurance

Growth in government over the 20th century is mostly due to the growth of social insurance (health and retirement benefits)

The Rise of the Social State in Europe

Figure 10.15. The rise of the social State in Europe, 1870-2015



Interpretation. In 2015, fiscal revenues represented 47% of national income on average in Western Europe et were used as follows: 10% of national income for regalian expenditure (army, police, justice, general administration, basic infrastructure: roads, etc.); 6% for education; 11% for pensions; 9% for health; 5% for social transfers (other than pensions); 6% for other social spending (housing, etc.). Before 1914, regalian expenditure absorbed almost all fiscal revenues. **Note.** The evolution depicted here is the average of Germany, France, Britain and Sweden (see figure 10.14). Sources and séries: see piketty.pse.ens.fr/ideology.

Utility function $U(c)$ increasing in consumption c and concave in consumption c :
 $U'(c) > 0$ and $U''(c) < 0$

Expected utility model: Individuals want to maximize expected utility defined as the weighted sum of utilities across states of the world, where the weights are the probabilities of each state occurring.

If q is probability of adverse event, expected utility (EU) is:

$$EU = (1 - q) \cdot U(\text{consumption with no adverse event}) + q \cdot U(\text{consumption with adverse event})$$

Actuarially fair premium: Insurance premium that is set equal to the insurer's expected payout.

In this setup, person has income W and can be sick with probability q

If sick, it uncurs a medical cost d

Insurance contract: pay premium p always, and receive payout b only if sick

Therefore the expected utility is:

$$EU = (1 - q) \cdot U(W - p) + q \cdot U(W - p - d + b)$$

Expected profits of insurers: $EP = p - q \cdot b$

Competition among insurers $EP = 0 \Rightarrow b = p/q$. (The **actuarially faire** insurance)

Individual maximizes EU by choosing $p \Rightarrow p = d \cdot q$

\Rightarrow consumption is the same in both states: $W - d \cdot q$

Because utility is concave: always desirable to reduce consumption in high-income states
to increase consumption in low-income states

Heterogeneity of risk across individuals

Now, 2 types of individuals: sickly ($q = q_S$) and healthy ($q = q_H$), with $q_S > q_H$

- **1st case, Symmetric Information:** Insurers can observe q_S and q_H types (e.g., age)

The insurer will charge 2 policies, each actuarially fair:

$$b_S = p_S/q_S \text{ for the sickly; } b_H = p_H/q_H \text{ for the healthy}$$

Each type, will choose to buy perfect insurance:

$$b_S = b_H = d, \text{ and } p_S = q_S \cdot d, p_H = q_H \cdot d$$

Private insurance equalizes income within types (\neq across) [$W - q_S \cdot d$ vs $W - q_H \cdot d$]

Note: if $W - q_S \cdot d < 0$: Sickly cannot afford insurance and dies if sick

- **2nd case, Asymmetric Information:** Insurers do not observe (or cannot price) types

If 2 policies, everyone will buy the healthy (cheaper) insurance \Rightarrow **Adverse Selection**

2 equilibrium possibilities: **Pooling equilibrium** (good for sickly, mediocre for healthy) or **Separating equilibrium** (partial insurance for healthy)

Adverse selection is when individuals know more about their risk level than the insurer and hence individuals with higher risk are more likely to purchase insurance.

Example: people with high risk of getting sick more likely to buy health insurance on Obamacare exchanges than people with low risk of getting sick (as insurers cannot discriminate based on pre-existing conditions)

With adverse selection, market for insurance can unravel in a **death spiral**:

Insurance is offered at average fair price, bad deal for low risk people and hence only high risk people buy it \Rightarrow insurers make losses \Rightarrow insurers raise the price further \Rightarrow only very high risk people buy it \Rightarrow insurers make losses again \Rightarrow no insurance contract is offered at all even though everybody wants full actuarially fair insurance

This inefficiency (market failure) arises because of **asymmetric information**

How do Government address Adverse Selection?

The government can address adverse selection and improve market efficiency but this involves redistribution

Natural solution is to impose a **mandate**: everybody is required to purchase insurance
⇒ If price is the same for everybody, low risk people subsidize high risk people

From a social perspective, being high risk (e.g., having a sickly constitution) is rarely consequence of individual choices ⇒ Society might want to compensate individuals for this

⇒ Explains why all OECD countries (except US) have adopted universal health insurance paid for by government

Obamacare three-legged-stool (a) forbids insurers from charging based on pre-existing conditions, (b) mandates that everybody needs to get insurance, (c) subsidizes health insurance for low income families

In 2019+, mandate (b) weakened by eliminating fine for not having insurance, will see whether this leads to death spiral on Obamacare exchanges

Health care as a right: Access to quality of health care (regardless of resources) perceived as a right

Redistribution: Insurers cannot insure against pre-existing conditions, so high-risks pay more. Might want to compensate them (often not their fault)

Externalities: Lack of insurance can be a cause of illness for me

Individual Failures: Individ. might not appropriately insure themselves (myopia, lack of information,...)

Moral hazard: Adverse actions taken by insured individuals in response to insurance against adverse outcomes.

Example: If you receive unemployment benefits replacing lost wages, you may not search as much for a new job \Rightarrow Insurance reduces incentives to remedy adverse events

Moral Hazard exists with both private and social insurance as long as insurer cannot perfectly monitor the person insured \Rightarrow Insurers do not offer perfect insurance

The existence of moral hazard problems creates the **central trade-off of social insurance**: insurance is desirable for consumption smoothing but insurance can create moral hazard

[similar to the problem of optimal income taxation equity-efficiency trade-off]

What Determines Moral Hazard?

How hard it is to observe whether the adverse event has happened

How easy it is to change behavior in get into or stay in the adverse event

Moral Hazard Is Multidimensional: In examining the effects of insurance, three types of moral hazard play a particularly important role:

1. Reduced precaution against entering the adverse state (example: auto insurance)
2. Increased odds of staying in the adverse state (example: unemployment insurance)
3. Increased expenditures when in the adverse state (example: health insurance)

⇒ Moral hazard increases the cost of providing insurance

Optimal social insurance trades-off two considerations:

1. The benefit of social insurance is the amount of consumption smoothing provided by social insurance programs
2. The cost of social insurance is the moral hazard caused by insuring against adverse events

⇒ Optimal social insurance systems should partially, but not completely, insure individuals against adverse events.

Asymmetric information in insurance markets has two important implications:

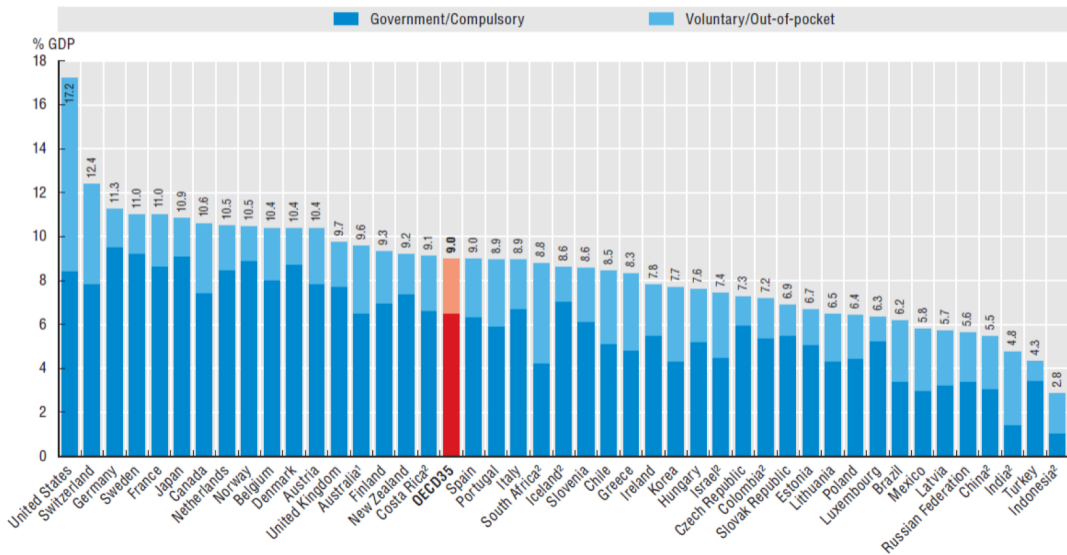
1. It can cause adverse selection in private insurance provision (as insurers cannot perfectly observe risk types) hence the need for social insurance
2. It can cause moral hazard (as insurer cannot perfectly monitor behavior), hence the need to **limit generosity** of insurance

The ironic feature of asymmetric information is, therefore, that it simultaneously motivates and undercuts the rationale for government intervention through social insurance.

An illustration: Health Insurance

Healthcare Expenditures: 9% of GDP on avg. in the OECD

Health expenditure as a share of GDP, 2016 (or nearest year)



Why do government get involvedi in healthcare?

Adverse selection: when individuals have heterogeneous risks of falling sick and the insurers do not know individuals' types, the private market will not be able to efficiently provide insurance.

Moral Hazard: when individuals use more medical services because they are insured and do not pay the full cost of the treatment.

Address this with **universal public health insurance**, to redistribute from the healthy to the sick

All OECD countries (except the US) provide universal health care insurance funded by taxation:

Individuals who get sick can have health care paid for by the government

Government either directly controls doctors/hospitals (like National Health Service in the UK) or government reimburses private health care providers (like in France or Germany)

Government controls costs and limits health-care over-consumption through:

1. Regulation (govt picks allowed treatments based on cost effectiveness, bargains for prices, rations care in some cases)
2. Patient co-payments (patients share part of the cost)

Is Universal Health Care Desirable?

Health care is expensive (even in countries which control costs) \Rightarrow Poor cannot afford health care on their own and need help

People face difference health risks (pre-existing conditions) \Rightarrow Those facing high health risks face very high insurance costs in private market

Should the government insure people for health risks? Yes if health risks outside people's control (age, genetics). Not necessarily if health risks due to choices (diet, exercise)

Virtually all OECD countries answer yes and provide universal health care

Not providing universal health care creates another big issue: adverse selection if private insurers cannot observe risks or cannot charge based on risks \Rightarrow Even those with low risks cannot get actuarially fair insurance

In all cases (private and public), health insurance needs to deal with moral hazard (over-provision, over-consumption)

The government can regulate and subsidize private insurance markets

Subsidies towards the private purchase of full insurance: this also involves redistribution (eg: tax subsidy to employer-provided insurance)

Regulation to limit the type of contracts that can be proposed by the private insurance market: force some degree of pooling. This does not necessarily ensure that all individuals will get insurance

Mandates: obligation to buy insurance. Combined with regulations, it forces a pooling equilibrium

Effect of Health Care on Utilization and Health: Oregon Medicaid Health Insurance Experiment

In 2008, Oregon had a limited Medicaid budget \Rightarrow used lottery to select individuals on waitlist to be given a chance to apply for Medicaid insurance coverage

30,000 “lottery winners” (treatment group) out of 90,000 participants (lottery losers are control group)

Not all winners received coverage. Some non-winners later received insurance on their own.

But it is still the case that winning the lottery increases probability of having health insurance by 29 percentage points

Finkelstein et al. (2012) use lottery as instrument to estimate causal effect of insurance coverage itself Two way to report the results:

ITT (intention to treat): just compare winners and losers

LATE (local average treatment effect): Inflate estimates by $1/[\text{difference in fraction insured between winners and losers}] = 1/.29 = 3.5$

Data sources: admin data from hospitals, credit reporting data, and survey responses regarding utilization, health, and financial outcomes

Key results: winning the Medicaid lottery leads to:

1. higher health care utilization (including primary and preventive care as well as hospitalizations)
2. lower out-of-pocket medical expenditures and medical debt (including fewer bills sent to collection agencies for unpaid debt)
3. better self-reported physical and mental health

THANK YOU!

These slides are available on my website: <https://bluebery-planterose.com/teaching>

These slides are partly based on courses by: Ghazala Azmat, Raj Chetty, Emmanuel Saez, Stefanie Stantcheva, and Gabriel Zucman.