Private insurance and social insurance

Private insurance markets are subject to market failure.

What is the market failure?

What are the tradeoffs involved in using government here?

The benefits of insurance (private or social) come from consumption smoothing. This benefit is reduced by crowding-out of private insurance/"self-insurance."

The cost of insurance (private or social) is the moral hazard it creates.

Fair to say, private sector insurance tends toward low benefit, low cost (moral hazard), public sector insurance tends toward high benefit, high cost.

Relative net gain is hard to say.

Benefit: Consumption Smoothing.

$U(c)$: preferences defined over one-dimensional consumption.

"States of the world": "good" and "bad".

Probabilities: p, bad state

$1-p$, good state

Action: To buy insurance (at some cost) or not.

Behavioral Assumption:

Buy insurance if and only if

Expected utility from buying

> Expected utility from not buying.

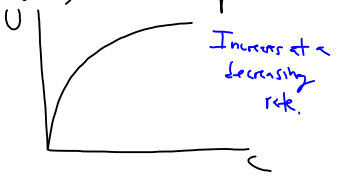
Expected utility from an "action":

$$EU[\text{"action"}] =$$

$$(1-p)\cdot U(\underbrace{\text{"action"} \mid \text{good state}}_{\text{an amount of money, defined by the action and the state.}})$$

$$+\ p\cdot U(\underbrace{\text{"action"} \mid \text{bad state}}_{\text{an amount of money, defined by the action and the state.}})$$

$U(c)=\sqrt{c}$, for example.



States and probabilities: "hit by car" (bad state), P=.01
"not hit by car" (good state), 1-P = .99

Action: Buy no insurance;
Not hit, C = $30,000
Hit, C = 0

Buy insurance --
at what cost?
Assume policy pays $30,000 in bad state.
Then premium would have to be (.01)(30,000) = $300
(Zero profit condition for insurance industry.
Expected revenue = expected costs).

Buy insurance;
Pay $300 up front.
Good state, C = $30,000 - $300 = $29,700
Bad state, C = $30,000 - $300 = $29,700.

EU("don't buy")
$= (.99)(30{,}000)^{.5} + (.01)(0)$
$= \boxed{171.5}$

EU("buy")
$= (.99)\cdot(29{,}700)^{.5}$
$+ (.01)\cdot(29{,}700)^{.5}$
$= \boxed{172.3}$

Buy.

General Result:

As long as utility increases at a decreasing rate and premiums are actuarially fair, people prefer full insurance to partial or no insurance.

In other words, "consumption smoothing" (have same consumption in both states of the world) is preferred.

Fundamental purpose of insurance, to transfer consumption across states of the world.

Full insurance is efficient, and would happen if we had actuarially pricing (equilibrium), but this pricing is unlikely.

Unlikely because of asymmetric information.

Multiple types, $\Rightarrow$ adverse selection.

Adverse selection

Two types, "careful" and "careless." They know who they are but the insurers do not.

100 careful, $Pr(\text{injured}) = .005$ (p = bad state)

100 careless, $Pr(\text{injured}) = .05$

Insuring \$30,000, so if everyone bought, expected cost to insurer:

$(100)(.005)(30,000) + (100)(.05)(30,000)$

$= (5.5)(30,000)$

$= \$825$

If insurer charged \$825, only careless will buy.

Don't insure: Careless:

$(.95)(30,000)^{.5} + (.05)(0)^{.5} = 164.54$

Do insure:

$(.95)(30,000-825)^{.5} + (.05)(30,000-825)^{.5}$

$= 170.81$

$EU(\text{insuring}) > EU(\text{not insuring})$

Careful don't buy:

Do not insure:

$(.995)(30,000)^{.5} + (.005)(0) = 172.34$

Do insure:

$(.995)(30,000-825)^{.5} + (.005)(30,000-825)^{.5}$

$= 170.81$

$EU(\text{not insure}) > EU(\text{insuring})$

Note: If $U(c) = c^{.01}$ instead of $U(c) = c^{.5}$, so everyone is very risk averse, even the careful would buy.

So the failure to buy at the "market like" fair premium (as opposed to the fair premium for the careful) depends on degree of risk aversion.

Two problems:

1) Careful aren't consumption smoothing. Consumption smoothing is feasible, so not efficient.

2) Couldn't be an equilibrium, since only careless will buy, and the insurer will lose money.

Firm has revenue $= (100)(825)$
$= \$82,500.$

Expected costs $= (100)(.05)(30,000)$
$= \$150,000$

$E(\text{Loss}) = \$67,500.$

Better conjecture about what will happen: Firm offers 2 policies,

High cost/high benefit: bought by careless.

Low cost/low benefit: bought by careful.

Can construct such policies that firm offers, people buy, and firm breaks-even in expectation, but in general you do not have both types fully insured (don't have consumption smoothing).

careless & careful

One policy:

$30,000 coverage at $1500 premium.

$(.05)(30,000) = \$1500$

careless

Low type will buy it, and won't want 2nd policy.

Second policy:

$10,000 coverage at $50 premium

careful

$(.005)(10,000) = \$50$

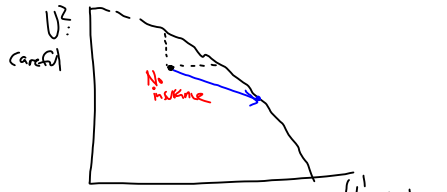
High type will buy it, and won't buy the first.

Only partial coverage though.

Government can overcome adverse selection by eliminating selection: "everyone must buy."

Could charge everyone $25, and balance its budget. Efficient.

But, redistribution from the careful to careless.



Government can overcome adverse selection. Get consumption smoothing.

Benefits sensitive to the amount of self-insurance people do.

Government insurance will crowd that out.

Is that a bad thing?

Has some benefits.

Cost to raising the revenue needed to pay claims may be large (taxes).

If self-insurance is good, then want to keep govt. out.

Self insurance is most feasible when
1) Negative event is predictable.
2) Negative event not too large.