The gain from insurance
(full information)

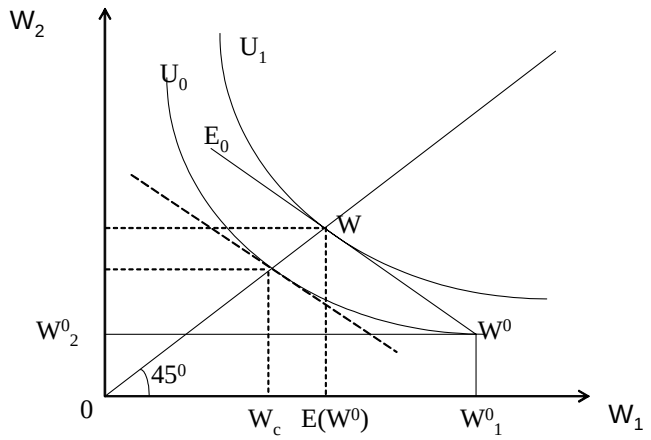

Figure 1:

Demand for insurance

- Risk aversion: $u\left(EW^0\right) > Eu\left(W^0\right)$,
  Risk averse individuals dislike uncertainty
- Assumptions:
  - no transaction costs
    (fair insurance is possible)
  - no social risk
    (full insurance is possible, even if all individuals are risk averse).
- Ex ante efficiency gain from insurance. Measured in
  - utility: $u^1 - u^0$
  - kroner: $E\left(W^0\right) - W_c$
    (where W_c is the certainty equivalent to the initial endowment $W^0 = (W_1^0, W_2^0)$, in Rees the symbol $\tilde{W}_1^0$ is used).
- Would you think the efficiency gain is large or small from health insurance? house (fire) insurance? house seller insurance?
- Conditions for insurance markets providing full and fair insurance.

Information asymmetries

1. Adverse selection (hidden information)

   - exogenous risks (p or L) differ across individuals. Here: p differ.
     The distribution of types is known, but individual type cannot be observed.

2. Moral hazard (hidden action)

   - the individual can reduce p or L through some costsly action (cost: $a > 0$), this action cannot be observed.

Adverse selection

A proportion $\lambda \in (0, 1)$ of low risk types with probability of loss p_L,
and $(1 - \lambda)$ high risk types, with probability, p_H, where $1 > p_H > p_L > 0$.

- With **full information** there is a unique separating equilibrium:
  Low and high risk types are offered and accepts, respectively, the contracts $(p_L L, L)$ and $(p_H L, L)$.
- **Hidden information,**
  more precisely, the insurer cannot identity individual risk type, but knows the values p_L, p_H and λ.
- With hidden information, the full information separating equilibrium is no longer feasible.
  Why?
  - Since L-types pay a lower premium, $p_L L < p_H L$, H-types will claim they are L-types.
    $\Longrightarrow$ The insurer makes a loss:
    $p_L L - (\lambda p_L L + (1 - \lambda) p_H L) = (1 - \lambda)(p_L - p_H) < 0$.
    $\Longrightarrow$ The low-risk individuals cannot be offered full insurance.
    This is the adverse selection problem.
- Is there any equilibrium?
- Only if λ is sufficiently low, say $\lambda < \lambda^*$.
  Then there is a separating equilibrium:
  - Two contracts: $(p_L C, C)$ where $C < L$, and $(p_H L, L)$ are offered.
    L-types choose the former, H-types the latter. (Self-selecting contracts.)
    $\Longrightarrow$ Low-risk types pay a lower premium, but underinsure.
  - Since each types pays their respective fair premium the insurer breaks exactly even (zero profits).
    $\lambda < \lambda^*$: there is no pooled contract that both would prefer *and* that would break even.
    (What happens if $\lambda > \lambda^*$?)

- An example of self-selecting contracts:
  Full coverage and "standard" premium,
  or accept a deductable on the loss (hence $C < L$), and pay lower premium.
- Compare the self-selecting equilibrium to the full information equilbrium.
  What is the difference?
  Who bears the cost of the information problem?

- **Regulation**

  - If we impose the restriction $C = L$ (full insurance),
    the contract $(\bar{p}L, L) = ((\lambda p_L L + (1-\lambda)\, p_H)\, L, L)$ is an equilibrium
    (provided, of course, that for both types this contract results in a higher utility than no insurance at all).
    Compared with the self-selecting equilibrium
    $\Longrightarrow$ H-types are better off (pay lower premiums) $(\bar{e} \succ e_H)$
    $\Longrightarrow$ L-types may or may not be better off $(\bar{e} \succ e_L$ or $(\bar{e} \prec e_L)$

  - Compulsory insurance

    1. To prevent (a vicious circle of) adverse selection:

    2. Fairness. Is it fair to differentiate premiums according to individual (exogenous) risks? $r_i = p_i L$?
       Example: Those born with a desease
       – A problem with self-selecting contracts.
       – The more public information, the greater a problem.
    3. Solves a free rider problem
       – that for practical and ethical reasons, it is difficult to deny a non-insured basic (particularly, acute) health care.

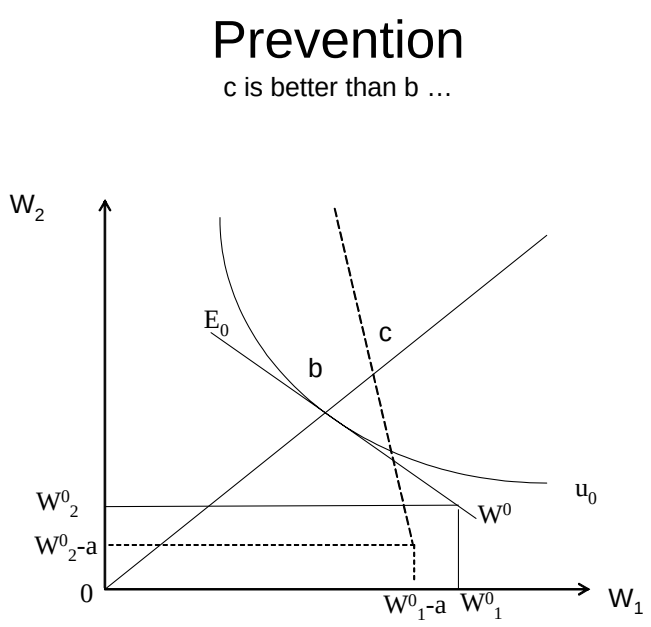

Figure 2:

Moral hazard

The individual can take an action (at cost $a > 0$) which reduces the probability of loss or the size of the loss.
Here: p is reduced from p_0 to $p_a < p_0$.

- Health care:
  Prevention. Actions that reduce the probability of illness or accident.
  It is frequently so that preventive measures cannot be observed (directly or documented) by the insurer.

- In figure 2: Expected wealth is higher with $a > 0$.
  With full and fair insurance the individual (in this example) will be better off paying for prevention, cf. $u^a > u^0$.

but d will be chosen.

Prevention vs. insurance coverage

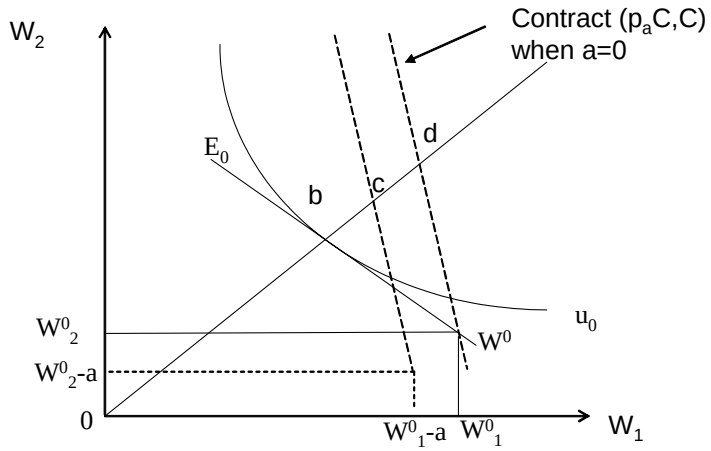

Figure 3:

- The moral hazard (**hidden action**) problem
  a cannot be observed.
  The full insurance contract $(p_a L, L) \Longrightarrow a = 0$ maximizes utility.
  $\Leftrightarrow$ socially efficient prevention is not undertaken
  Why? Since $C = L$, she has no incentive to pay $a > 0$ to reduce the prob. of loss
  $\Longrightarrow$ full insurance cannot be maintained, the insurer makes a loss: $p_a L - p_0 L < 0$.

- What contracts can be offered (if any)?

- This is *ex ante* moral hazard
  - unobservable actions taken before health state is known (influencing p or L).
- How important is ex. ante moral hazard?
  - Kenkel, Handbook of Health Economics, chapter 31
    "... suggests an explanation for the casual observation that cigarette smoking seems more prevalent in many Eurpoean countries than in the U.S., despite the relatively low taxes imposed on cigarettes in the U.S.: in European countries widespread public sector health insurance reduces individual and third-party incentive for prevention."

    "... empirical evidence not conclusive, but tends to suggest that *ex ante* moral hazard is not a very strong force leading to insured consumers investing in less prevention. .... may be that ... is largely sovled by health insurance that covers only financial and not the health losses of serious illness."
- *Ex post* moral hazard
  - unobservable actions influencing the use of treatment once sick
  - by the patient, or the service provider (doctor, hospital ...).