HOW TO PREDICT INDIVIDUALS' EXPENDITURE:

Plan choice is the possibility of choosing different levels of partial and full coverage according to different set of preferences. The **identity of the buyer** can affect expected costs of insurance plans. **This might hinder (ostacolare) competition.**

Individuals' HC expenditure varies a lot and it is barely predictable.
Total healthcare expenditure variation V in the population:

$$Exp_i = \alpha + \beta X_i$$

Statisticians know the **systematic V** variation in health care expenditure:

$$\overline{Exp_i} = \bar{\alpha} + \bar{\beta} X_i$$

Residual (random) V = $Exp_i - \overline{Exp_i}$ is the difference between the observed value and the predicted value, that we cannot predict. The random component generates the demand for insurance.

- If the **variation was completely random** → ideal situation with same premium for everyone.
- If each person's spending was **exactly predictable**, there would be no utility gains from insurance.

The literature suggests that **Systematic V** that humans can explain is about **10 to 25% of total variation.**

ADVERSE SELECTION:

Let's assume we are in a situation where p is the probability of falling sick and 1-p is the probability of remaining healthy. Moreover, we have two types of individuals: the low risk L and the high risk H; therefore, $p_L < p_H$, meaning that the probability of falling sick for the high-risk individual is higher than the probability of falling sick for the low risk individual.
If plans could charge individuals their PREDICTED cost for enrolling, then the actuarially fair premium for the low risk $\pi_L = p_L I$ would be lower than the actuarially fair premium for the high risk $\pi_H = p_H I$.

However, usually individualized premiums are generally not imposed:

- unfair to make people pay more because they are sicker
- knowing individual-specific prices infeasible (infattibile).

We usually **observe average premiums** like:

$$\pi = [\lambda p_L + (1-\lambda) p_H] \times I$$

Where λ is the fraction of low-risk in the pool of enrollees.

We might have **two types of contracts**: full and partial coverage.
If we want to sell full coverage plans ($I^F = M$), the premium would be higher than that for the partial coverage($I^P < M$), because the coverage is more generous, so the indemnity is larger.
However, if plans can only charge average premiums, we observe the following premiums for full coverage and partial coverage

$$\pi^{Full} = [\lambda^{Full} p_L + (1-\lambda^{Full}) p_H] I^{Full}$$
$$\pi^{Part} = [\lambda^{Part} p_L + (1-\lambda^{Part}) p_H] I^{Part}$$

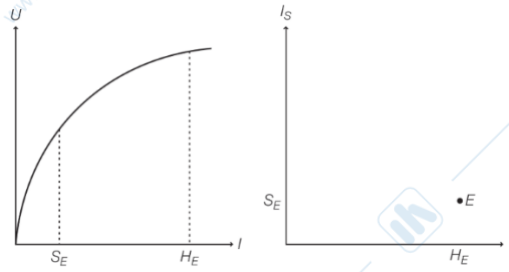
Therefore, we will have **adverse selection,** which occurs when individuals who are more likely to experience losses are more inclined to purchase insurance, e this can limit efficiency when we have asymmetric information. 1**Adverse selection** makes generous plans (more complete plans → with full premium) to charge larger premiums, not only because they offer more complete coverage ($I^F > I^P$), **but also because they attract a worse mix of enrollees** $1-\lambda^{Full} > 1-\lambda^{Part}$

However, this can lead to a pool of insured individuals that is riskier than anticipated by the insurance company, potentially resulting in financial losses for the insurer:

- **Low risk** people **opt for partial plans** to avoid paying for the higher costs of very sick people.
- **Complete plans** will rate very **high premiums**

Plans will have incentives to **distort** their offerings **to attract the healthy and repel the sick**.

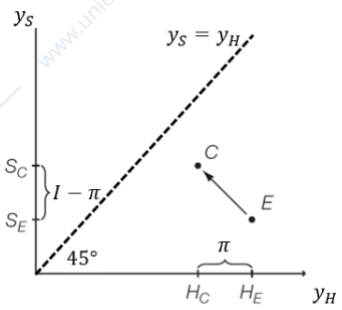
The YH–YS space and Income-utility space



In Figure 1, the horizontal axis represents income, and the vertical axis represents the utility derived from various income levels. If we try to examine multiple insurance contracts using this diagram, the graph becomes useless. To address this issue, we use figure 2. The horizontal axis represents income in a healthy state and the vertical axis represents income when sick.

The key concept is that *insurance contracts transfer income from the healthy state to the unhealthy state*. In Figure 1, if an individual remains healthy and not insured, he has an income of HE; if he falls sick and not insured, the income is SE. The point E = (HE, SE) is defined as the **individual's endowment**. In Figure 2, this endowment point E shows the individual's income in both healthy and sick states before any insurance steps in.

$y_H - y_S$ space: partial insurance

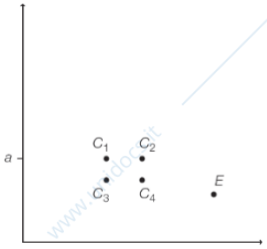


The 45° line represents a situation where the individual receives the same level of income $y_S = y_H$ independently from his health condition.
Let HC and SC represent income in the healthy and sick states for the same individual with a **partial** insurance contract represented by point C.
The horizontal distance between E and C shows the premium π (what he individual must pays if he remains healthy), whereas the vertical distance between E and C = net payout/indemnity that receives sick ($I - \pi$ so it is the indemnity minus the premium)

$$H_C = H_E - \pi \text{ and } S_C = S_E + I - \pi$$

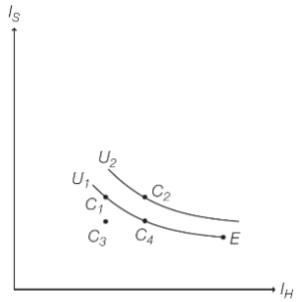
$y_H - y_S$ space: preferences

Figure shows the endowment point E and four potential insurance contracts C1 to C4. *Which one is the most preferred?*



Regarding contract C1 and C2: both pay out the same net indemnity if sick, but contract C1 involves a larger premium, therefore C2 is better. (cheaper).
Comparing C_1 to C_3, they both involve the same premium, but C1 gives a higher net payout if sick, therefore the individual always prefers C1 to C3.
Cannot rank C_1 to C_4
Cannot rank these to E

Indifference curves in yH – yS space



These indifference curves will have two basic properties: **downward sloping**, because individuals are willing to give up income in one state if compensated for more income in the other state, and **convex** because they are risk-averse.

They are steeper at low levels of y_H but flatter at high levels because at high levels of y_H a marginal increase in y_S is valued much more than a marginal decrease in y_H. y_S and y_H are imperfect substitutes, the individuals prefer to maintain moderate level of both.

ZERO PROFIT LINE

By definition, a **full-insurance contract** achieves state independence, $y_H = y_S$. A fully insured individual is guaranteed the same income whether she is sick or healthy → the **zero profit** line **contains all actuarially fair contracts**. Set of contracts such that the premium equals the expected payout. If *the individual is very likely to be sick, a certain set of contracts with high premiums and low payouts will be actuarially fair. If the individual is very likely to be healthy, a different set of contracts with low premiums and high payouts will be fair.* The insurer makes zero profit if:

$$\boldsymbol{p(I-\pi) = (1-p)\pi}$$

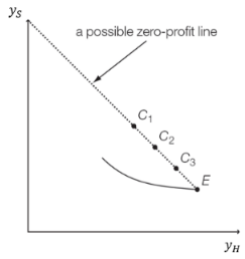
Suppose an individual with a probability of falling sick p starts with an income at endowment point E=(HE, SE). Her income without insurance is HE if she is healthy, and SE if she falls ill. Therefore, if I substitute the net payout if sick and the premium, we obtain:

$$p(y_S - S_E) = (1-p)(H_E - y_H)$$

We substitute S_E (the income the individual enjoys if he falls sick in the endowment point with y – M, where y is the income of the individual and M is the cost of medical care, and substitute H_E with y.

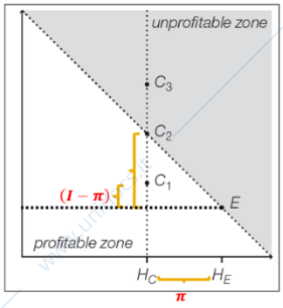
$$p(y_S - y + M) = (1-p)(y - y_H)$$

By expliciting Ys, we find:



$$\boldsymbol{y_S = y - M + \frac{(1-p)}{p}(y - y_H)}$$

This equation defines a zero-profit line with slope $\frac{(1-p)}{p}$, which is the fraction of those who remains healthy over those who falls sick. *The slope changes with p; a more sickly person with higher p has a flatter slope than a less sickly person with a lower p. By contrast, the slope of the full-insurance line does not change with p.*

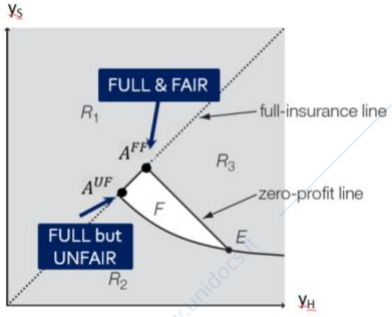


Profitable and unprofitable contracts

We have the zero-profit line passing through the endowment point, and then we have 3 contracts: C2 is on the line, while C1 is below and C3 is above.
C2 is on the zero-profit line and hence makes zero profit. **C1 charges the same premium as C2 but pays out less** → contracts in this region always make positive profits for the insurer. On the other hand, **contracts above the zero profit line pay out more for the same premium** → they all make negative profits for the insurer. They do not exist because insurance companies like the profitable, actuarially unfair contracts or at least the zero-profit actuarially fair contracts.

The feasible contract wedge

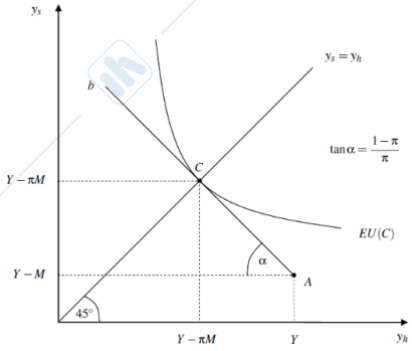
The full-insurance line, the zero-profit line, and indifference curves divide up the IH –IS space into four regions, labeled **R1, R2, R3, and F**.



- **Region R1** contains the contracts that are more than full insurance, because they pay out more to customers if they get sick than if they stay healthy: YS > YH → the market will produce no contracts.
- **Region R2** contains contracts that all lie below the indifference curve passing through E. Individual prefers E to any contract offered in this region. These contracts ask a high premium and offer so little in return that uninsurance is preferable. No successful contract can exist here.
- **Region R3** contains only unprofitable insurance contracts as it lies above the zero-profit line. No insurance company will offer insurance contracts here because they would lose money.

- the **region F** is called the *feasible contract wedge* because it is the only region where contracts can exist, because they are at least zero profit for the insurance company and at least providing the same level of utility than in the status Quo. All points on the edge of the wedge are feasible as well. A^{UF} is full but unfair, while A^{FF} is full and fair.

Demand for indemnity insurance: the base case



An individual exposed to an expected loss, if offered an actuarially fair indemnity contract would opt for full insurance.

In figure the endowment point is A. Y is the income if the individual is healthy and uninsured and Y – M is the income when the individual is sick and uninsured. Point C is the contract fair and full, for which the insured income is **y minus the fair premium (pM), exactly equal to the level of indemnity I** (which has to be equal to medical expenses).

The equation of the zero profit line is $y_S = y - M + \frac{(1-p)}{p}(y - y_H)$ ***where the slope is*** $-\frac{(1-p)}{p}$

In order to **draw the indifference curve**, the expected utility differentiation has to be equal to zero:

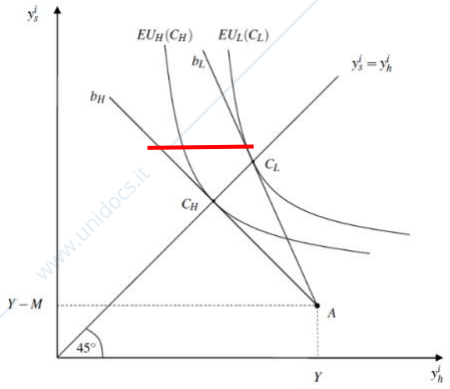
$$dEU = pU'_{y_s}dy_s + (1-p)U'_{y_h}dy_h = 0$$

The equation of the indifference curve is $\frac{dy_s}{dy_h} = -\frac{(1-p)}{p}\frac{U'_{y_h}}{U'_{y_s}}$

$$MRS_{h,s} = \frac{1-p}{p} \Rightarrow \textbf{which implies that } u'(y_h) = u'(y_s)$$

ROTHSCHILD-STIGLITZ : symmetric information case…. FIRST BEST

Suppose there is an economy in which a fraction λ of the individuals are low-risk L and 1 - λ of the individuals are high risk H. low-risk (L) and high-risk (H). Type L has a chance p_L of falling sick in a given year. Type H has a chance $p_H > p_L$ of becoming sick.



The two individuals have the same endowment point: in good state, income is y for both types; in bad state, income is $y - M$.

They have different indifference curves due to the different probability of becoming sick.

The slope of the zero-profit line is $= -\frac{1-p_i}{p_i}$

Therefore, since $p_H > p_L$, the zero-profit line for insuring the low risk is steeper than the zero-profit line for insuring the high risk.

Let's assume that they have the possibility to buy insurance, and that the contracts are on the zero-profit line. C_L is the contract offered to low risk individuals and C_H is the contract offered to high-risk individuals. Since the probability of becoming sicker is higher for the high risk, they will need to pay a higher premium.

These are FIRST BEST CONTRACTS because, since there is perfect (symmetric) information, both individuals will receive FULL coverage, even if high risk individual will pay a higher premium and receive a lower net indemnity than the low risk individual. However, **First-best contracts cannot be an equilibrium** because all the high-risk type would buy the low risk's contract and insurer goes out of business, since they give full coverage, but are cheaper and the net pay out is higher.

ROTHSCHILD-STIGLITZ: asymmetric information case

Let's assume that there is asymmetric information, meaning that insurers cannot identify the individual's risk type. They just know λ so the share of low risk type in the population, but they do not know who is what. No

moral hazard, static model and the market perfectly competitive : insurers offer contracts (π, I), just break-even, each individual buys exactly one insurance contract.

An **equilibrium** is defined by a set of insurance contracts such that:

1. individuals optimize both types cannot find a better contract than the chosen one
2. firms optimize: all firms earn zero profits

We have 2 types of equilibrium:

- **Pooling**: both (all) types are offered the same contract.
- **Separating:** different risk types sorted into different contracts.

A *pooling equilibrium* arises if both (all) types opt for the same contract, but they never exist.
A *separating equilibrium* exists if it can solve the issue that High-types may prefer the cheaper contract designed for the L-types (separating contracts must be "*incentive compatible*").

Pooling equilibrium (PEq)

We have a different "intermediate" zero profit line that holds when both types subscribe the same contract.
Now the pooling contracts Z comprises a premium π_Z and an indemnity I_Z.
Given I_Z then π_Z should be $\boldsymbol{\pi_Z = pI_Z}$, while the probability of picking someone that falls sick in the population is: $$p = \lambda p^L + (1-\lambda) p^H$$
Which is equal to the probability of picking a low risk individual times the fraction of low risk individuals + the fraction of high risk individuals times the probability of picking a high risk individual. → Measure the average probability of falling sick out of a population that mixes up the two types.

Graphically, this **zero profit line is in between the two of before, and is steeper the larger is the fraction of the low risk** (so it will be closer to the low risk type zero profit line). If someone gets out of this pool, the equilibrium breaks, because the weighted average will change.

The actuarially fair pooling contract implies :

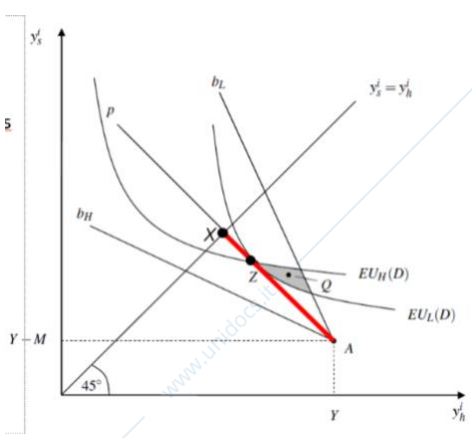
- For the L-type: if they fall sick, they will receive the indemnity of the pooling contract with a probability p^L (which is the probability for them to fall sick). I need to take this $\boldsymbol{\pi_Z - p^L I_Z}$ and **substitute p** with $\boldsymbol{\lambda p^L + (1-\lambda) p^H}$

We obtain this $\boldsymbol{\pi_Z - p^L I_Z = (p^H - p^L)(1-\lambda) I_Z > 0}$, **w**hich is always larger than zero, because even if the premium is actuarially fair on the pool, it is less than fair for the low risk individuals and more than fair for the high risk.

- H-type: $\boldsymbol{\pi_Z - p^H I_Z = -(p^H - p^L)\lambda I_Z < 0}$, they pay a premium that is actuarially fair on the pool, and receive an indemnity I_Z with probability p^H → remember that $\boldsymbol{p_H > p_L}$.

  The low risk would pay a large premium but would receive an indemnity less frequently, because they fall sick less frequently: here is a transfer $[= (p^H - p^L) I_Z]$ from the low risk to high risk.

  ➔ Pooling is a tool for redistribution from L to H, but is CANNOT BE SUSTAINED BY THE MARKET.



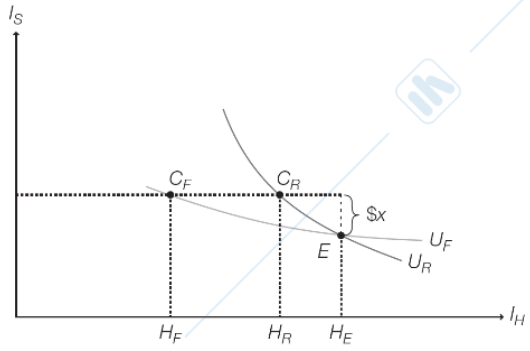
Non existence of pooling equilibria

bH and bL are the two zero profit lines for contracts that are sold SEPARATELY to the low risk and high risk indiiduals.
The **«pooling» zero-profit line P** lies between the L-type and the H-type zero-profit lines. It's slope depends of the fraction **λ (**in the graph is about 50%).
It collects contract that are less (more) than fair for the L(H)-type.
From A to X we have a list of contracts that are zero profit provided that all the individuals in the population subscribe.

- Contract X is full insurance and fulfils the zero profit condition of the pooling, it is the best for the H-type but not for the L type.
- Contract Z is a candidate pooling contract, because rests on the population zero profit line (if Z lies to the right of the zero profit line, then firms loose money; if it lies to the left, other insurance firms could enter the market and make money); moreover, both the high and low risk types choose Z over endowment point A, because it brings them to a higher utility. Z is the best pooling contract for the L-type. Because it is on a higher level of utility and because it is INCOMPLETE: since Z is unfair for the low-risk, the individual would prefer to buy partial coverage than full because full may cost even more.
- However, because the two indifference curves have different slopes, they form **a triangle region** that a potential insurance company entering the market can exploit. If a different company offers an insurance contract at Q: since it is above the indifference curve for the low risk type, they would prefer to switch to Q, while the high risk type would remain in Z because their utility level is higher there.

Therefore, we have a case of adverse selection: contract Q attracts low risk type but leaves high risk type at Z. This is good for the company offering Q: because the expected pay out to the low risk individuals are low, the firm makes positive profits (it is to the south west of the low risk zero profit line).
At the same time, only the high risk type most likely to be sick choose Z, which drives up the company's expected payouts and makes Z unprofitable. (it is to the northeast of the high risk zero profit line).
Therefore, pooling equilibrium cannot exist, **because of the relative shapes of indifference curves**, there will always be a triangular zone where an enterprising company can offer a contract like Q.

Indifference curves



YL is the Indifference curve of the low risk individual while YH is the one of the high risk individual. will be flatter than the one by the robust.
All risk averse would be happy to trade income in the healthy state for income in the sick state; however, low risk individuals are more likely to end up healthy, so they place a relatively higher value on Yh than high risk do. Who values y_S more relative to y_H? The frail does it, so he is willing to give up more when healthy.

The low risk individual is willing to give up a lower premium to enjoy the same level of net income when sick than the high risk, which is willing to give up a higher premium (willing to pay a larger amount).
The marginal utility of income in the two states of the world is the same, what differs is the probability of falling sick. → marginal expected utility of income for the high risk is higher than that for the low risk.

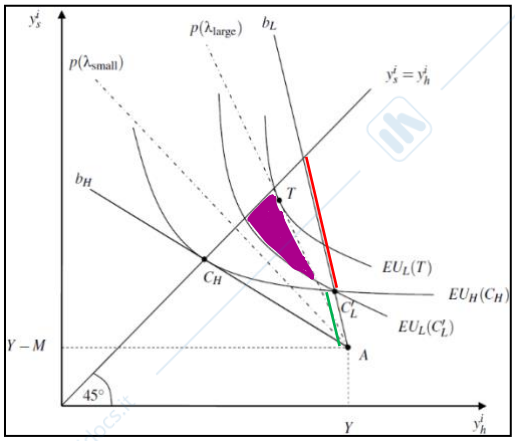
Low risk type has a steeper indifference curve; Indifference curve of the high risk will be flatter than the one by the low risk. The actuarially fair pooling equilibrium is inevitably less than fair for L-type and more than fair for H-type. It can be reached as a compulsory solution imposed by the government. (NOT BY THE MARKET)

Existence of a separating equilibrium

While a pooling equilibrium can never exist, a separating equilibrium can sometimes exist. The separating equilibrium refers to a set of 2 contracts that satisfies the equilibrium conditions, one that attracts the low risk type and one for the high risk type.

We have seen separating equilibrium under the assumption of perfect information; however, this equilibrium breaks down if the insurance companies cannot distinguish between low and high risk individuals, because all the high risk type would buy the Low risk's contract since they give full coverage, cheaper and the net pay out is higher.

A separating equilibrium can exist if insurance companies make the contracts designed for the low risk so unattractive for the high risk such that their original contract looks good by comparison, therefore they would not be willing to change it.



The contracts C_H belongs in the equilibrium set: it is a fair and full contract, and it is the tangency point between the zero-profit line of the **high risk individuals and their indifference curve.**

In order to find a second insurance contract that will not tempt the high risk individuals to leave C_H, the second contract needs to lie on or below their indifference curve. All the contracts on the red line are fair and very cheap, and are desirable by the low risk type (because they lie on their zero profit line) but also by the high risk type, because they bring a higher utility to them.

All the contracts that lie on the green segment, are zero profit if they are subscribed by the low risk, but they are **partial "enough"** to discourage high risk type, despite they are very cheap.

Let's consider contract C'_L which is at the intersection of the indifference curves of the high risk and low risk individuals and the zero profit line of the low risk individual.

- The high risk type are indifferent among C_H and C'_L, since they both lie on the same indifference curve. However, although C'_L is a lower price insurance contract, it only provides a small quantity of insurance (not full); since the high risk are very likely to become ill, they prefer contract C_H which is more expensive with a higher premium but it is full.
- The low risk type prefer C'_L to C_H because it is the only contract in this case that lies on their zero profit line and on their indifference curve.

In conclusion, because those contracts lie on the risk types' respective zero profit lines, the **insurance makes zero profit on each contract, and they satisfy the definition of equilibrium.**

We need to remember that the contract offered to the low risk type are PARTIAL, while the one offered to the high risk type is FULL : **h-risks receive the first best solution (**they are fully insured and receive actuarially fair contract), while **L-risks are rationed**: they do not receive the first best solution, because they are "forced" to accept a partial coverage in order to make the high risk not to mix up with them.

What happens when **λ is large? → it might be possible to attract into a pooling contract high and low risk**

In the figure, the two dashed lines are the two possible pooling contracts, the one more on the left is the pooling zero profit line for when λ is small (low proportion of low risk type in the population) and the other one is the pooling zero profit line for when λ is larger. **P (λ large)** is the line that collects pooling contracts that are fair for the entire population, for when the high risk are a tiny fraction of the population. When the fraction of low risk in the population is very high, **P (λ large) creates a new region below the pooling zero profit line and above the indifference curve of the low risk. (purple in the figure):**

If a company enters the market and offers a contract in this region, it will attract both types of customers:

- The high risk will be willing to give up full insurance to get lower premiums
- The low risk will be willing to give up actuarially fair insurance to get something closer to full insurance.

Therefore, the previous separating equilibrium will fall under these circumstances, but then again we know that this pooling equilibrium cannot exist → we end up with no equilibrium (market fails and we need government intervention) when we have asymmetric information and adverse selection and when **λ is large.**

Separating equilibrium and information disclosure

If a separating equilibrium exists, insurance firms will offer two contracts:

- a full-insurance with a high-premium contract for high risk
- a partial-insurance with a low-premium contract for low risk

Each consumer "self-select" by choosing the contract that has been designed for his/her type, and by observing consumers' choice, insurers learn consumer's type

Ex-post there is information disclosure.

Conclusion:

- Pooling equilibria cannot exist: the robust would never voluntarily subsidize the frail. Pooling contracts might be only imposed by law.
- If a separating equilibrium exists, robust individuals will be ***quantity constrained***
- With a large fraction of low risk individuals in the population, separating equilibrium might not exist.
  ➔ Public intervention is necessary (also to prevent that low risk type are quantity constraint).

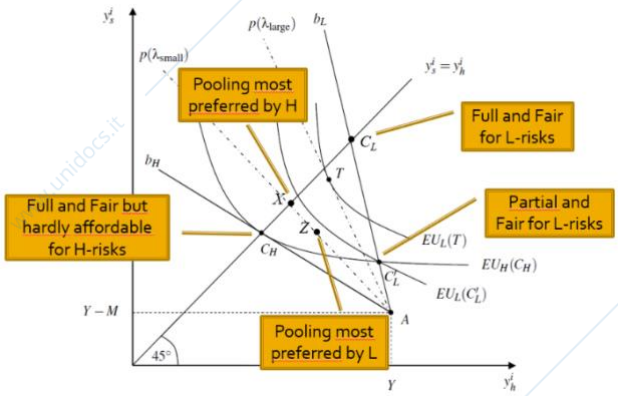
ROLE OF THE GOVERNMENT

Competition minimizes predictable profits and leads to FAIR PREMIUMS, there is a sort of equivalence between premium and expected costs for each contract, which make impossible to offer pooling equilibrium
Given the huge variation in predicted expenses among individuals, this pricing outcome makes healthcare insurance either:

- **unaffordable** to (the poorer) high-risk individuals
- **partial** to all low-risk individuals

we have a sort of deviation from what is socially desirable.

Shall we regulate competition?

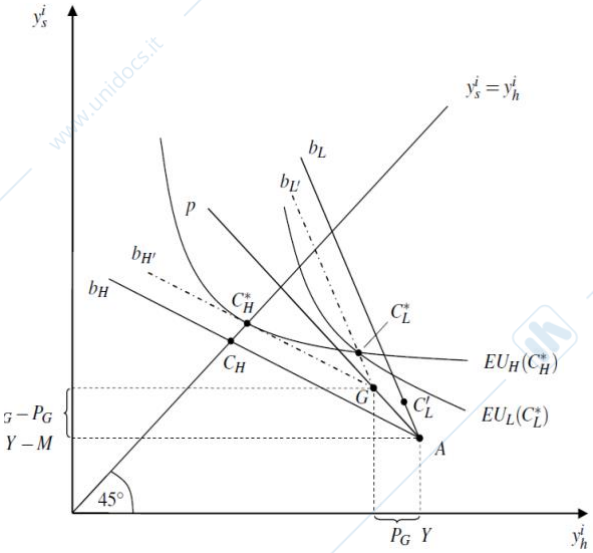


Let's assume that there is a **low fraction of low risk type**, therefore a separate equilibrium might exist: the equilibrium would be C_H for the high risk (fully and fair but hardly affordable) and C'_L for the low risk (partial and fair). High risk type would like to move from C_H to X, as they still would have full coverage cheaper. C'L is not the best contract for low risk type because they are very far from full insurance (they would like to move towards the 45° line), wo they would prefer to move towards Z, but this cannot be a market equilibrium.

If we assume the goal of a universal insurance, then the government could force everyone to buy an insurance contract at the intersection of the full-insurance line and the population zero-profit line, but the premium would be less than fair for the low risk individual and more than fair from the high risk individual.

Which direction is the best?

Since in a separating equilibrium **L-type are rationed: there is space for Pareto improvement.** → government can impose a **compulsory pooling partial coverage** (on the same zero profit line but that is more partial than X and Z). The premium for this new contract is $\pi_G = (\lambda p_L + (1 - \lambda) p_H) I_G$
This policy implies a transfer from L to H.



The endowment point moves from A to G.
Zero profit line is P, which is between bL and bH, and over this line we look for partial pooling contract imposed by law (not sustainable by market equilibrium). → there will be transfer of money from the low risk in favor of the high risk.
Contract G is actuarially fair because it lies in the pooling zero profit line, and it is partial because very far from the 45° line.
The idea is to keep all the citizens under a **compulsory pooling partial coverage** sponsored by the government → movement of the status quo A, situation w/o insurance, to point G (public supported package of care), which becomes the new status quo.
We draw from that point the new zero profit line bH' and bL'. There is a reduced extent of income drop produced by health shock because one fraction of this income drop is covered by the public insurance → the **market will insure the residual of income drop caused by health shocks.**
By conducting an analysis, we find:

- High risk type benefit from this because they are going to be subsidized by the low risk. IN expected term they pay less than what they receive. They go from Ch to Ch* which is on a higher level of utility.
- The low risk type move from C'L to C*L, which is a bit closer to the 45° line, so it is less partial, increasing their utility. Usually, we hear that the redistribution reduces the efficiency in an economy: however, in this situation, are distributed resources from low risk to high risk is beneficial also for the low risk. **Redistribution is efficient!!! → this is a reason for public intervention in insurance markets**.

Menu for **partial coverage** outcomes:

- Compulsory basic insurance + supplementary private insurance
- An equivalent Pareto improving policy can be reached by a tax on partial insurance and a subsidy on full insurance. It is up to the policy maker to choose what method to adopt.

Full coverage can be attained by relying upon compulsory public insurance pooling equilibrium only: AS outlawed. Always possible but this implied that adverse selection is outlawed.

PREMIUM RISK

Adverse selection is a problem of asymmetric information: individuals know their likely medical care utilization but insurers either know less or are not allowed to use this information. However, **as transactions are repeated,** in the long run, insurance identify high risk.

What happens if an individual is affected by a chronic disease? It is a health shock that produces effect for the rest of his life, which produces a systematic increase in the systematic cost to cure this individual: called **premium risk**.

As time goes nature progressively reveals who is which type. In the residual lifetime expected HC expenditure tend to diverge more and more across individuals.

One possible solution could be pooling every individual at birth (so they cannot escape that pooling), but it is not a possible **market solution:** robust to progressive revelation of information and allowing for insurance switching (competition). The problem is to keep all of them in the same pooling contract (divergency).

CONCLUSION:

The RS model reaches 2 major predictions:

- Competition drives out pooling equilibria: the robust would never voluntarily subsidize the frail
- In a separating equilibrium, robust will be *quantity constrained*, frail will hardly afford to insure.

Compulsory partial pooling contracts can improve efficiency and welfare allowing:

- the L-risks to get closer to full coverage
- the H-risks to be moderatly subsidized
- Similarily tax&subsidies.

Premium risk heavily affects the market for HC insurance: no easy market solutions. To make health insurance affordable for those becoming high risks the only way is to organize **long run implicit** or **explicit cross-subsidies from L- to H-type**. So developing some form of pooling, can be hardly done without government intervention. **Variation across countries due to differing social values about this cross-subsidization.**