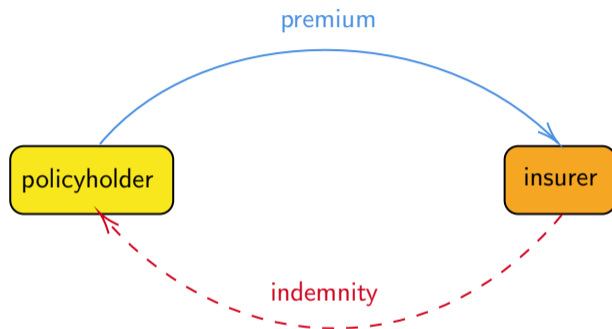


Individual risks and collective decisions

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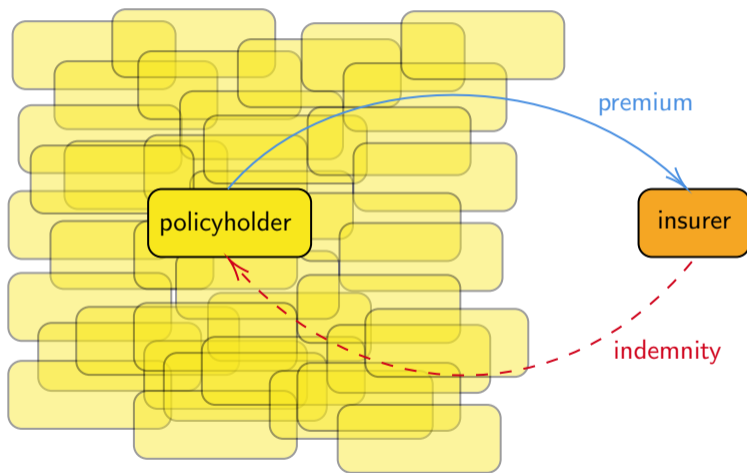
Insurance and risk transfert



- ▶ Classical in economics of insurance, e.g. $u(w - \pi) \geq \mathbb{E}[u(w - L)]$
- ▶ Classical from a legal perspective
- ▶ Classical in actuarial science, e.g. pure premium $\pi = \mathbb{E}[L|\mathbf{X} = \mathbf{x}]$

Insurance and risk pooling & solidarity

- Insurance is the contribution of the many to the misfortune of the few



Insurance and premium “individualization”

▶ Individualistic approach

- ▶ The individualistic approach to equality analyses fundamental rights, such as the right to equal treatment, in terms of individuals.
- ▶ An individual cannot be treated differently because of his or her membership in such a group, particularly in a group to which he or she has not chosen to belong.

▶ Group approach

- ▶ The insurance tradition, on the other hand, analyses risks, premiums and benefit schedules in terms of groups
 - ▶ Actuaries only consider individuals as members of a group
 - ▶ Unlike the “individualistic” approach, insurance classification schemes rely on the assumption that individuals answer to the average (stereotypical) characteristics of a group to which they belong.
- ▶ See [Thierry and Van Schoubroeck \(2006\)](#) and [Lehtonen and Liukko \(2015\)](#)

Personalisation & Discrimination I

- ▶ All members of the insurance pool should pay according to the risk they constitute for the pool, see [Lehtonen and Liukko \(2015\)](#).
- ▶ Those with lower risk also pay less.
- ▶ Technical capacity to calculate levels of risk for categories of insureds. If taken to its extreme, risk classification could mean that each insured could constitute his or her own separate risk class.
- ▶ If the insurance company has a table of risk at its disposal, it can apply this table to one client without needing to assemble a pool.
- ▶ But if there is no pool and the risk is only divided between one client and the company, it is not really spread. Instead, the client and the company just gamble...
- ▶ One of the basic characteristics of insurance is “**mutualization**”, which is the formation of groups.
- ▶ Ideally, the totality of small contributions of a group should statistically fully compensated for by the totality of the contributions made by this group.

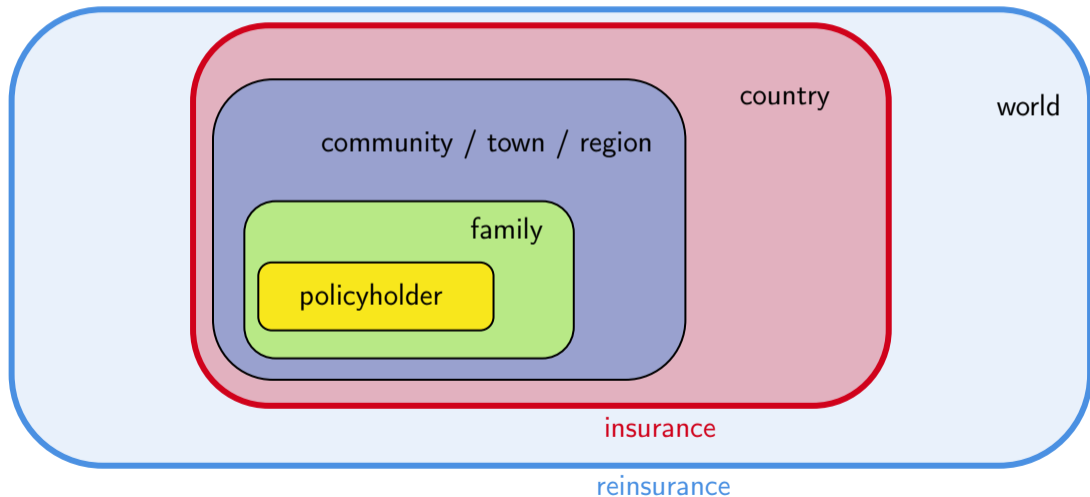
Personalisation & Discrimination II

- ▶ Consequently, mutualization (or “**solidarity**”) is intrinsic to the classification of insurance risks.
- ▶ However, mostly it involves solidarity between those insured that have a same risk profile (with a comparable loss probability and loss extent), see “**autocalibration**”
- ▶ This means that those who are fortunate in the group – those that do not suffer damage – are co-payers for the unfortunate ones suffering damage.
- ▶ This solidarity is the so-called “**pure chance solidarity**” that can be regarded as the genuine insurance solidarity.
- ▶ Through increasing classification, insurers aim to decrease subsidizing solidarity as much as possible.
- ▶ The ultimate aim is to set a “**just and fair**” premium for each insured person.
- ▶ All groups should be treated equally and should not be subsidizing one another

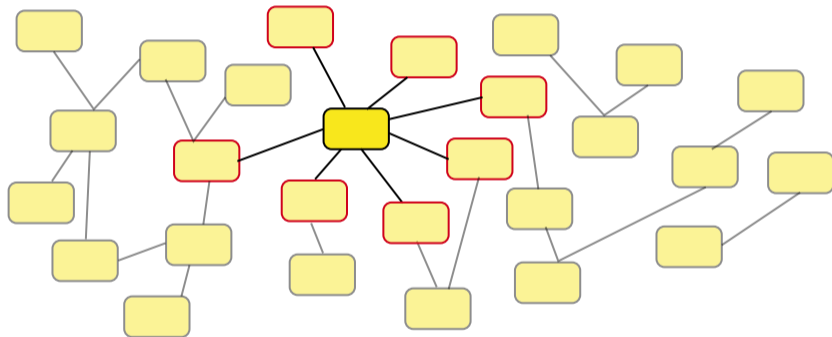
Aversion for correlation (?)

- ▶ Collective risk and individual decisions ?
- ▶ What are properties of and differences between governance arrangements in which responsibility for collective risks is allocated to individuals?, [Spruit et al. \(2021\)](#)
- ▶ *“While not doing away with a conception of individual responsibility, both public and private insurance arrangements transfer responsibility to a pool whose members all carry the responsibility for the harmful events that any of the pool”*
Lehtonen and Liukko (2015) about [Ewald \(1986\)](#)
- ▶ All participants of the pool are involved in covering the economic damage that the pool as a whole encounters
- ▶ Premiums paid are not individuals' own money, but future liabilities for the whole insurance pool
- ▶ See [Denuit et al. \(2010\)](#) and [Rheinberger and Treich \(2016\)](#) on aversion (or preference) for correlation

Layers of risk pooling: what means “collective” ?



Decentralized insurance schemes



Possible to pool risks on a network (see [Charpentier et al. \(2021b\)](#))

Natural Catastrophes

- ▶ Actuarial fairness presupposes that people can, to a degree, be held responsible for the risk they transfer to the pool
- ▶ “individualization” (as in [Beck \(1992\)](#)) does not work in several case
 - ▶ climate risks
 - ▶ pandemics
- ▶ Decision theory should integrate some [game theory](#)* framework, [Charpentier and Le Maux \(2014\)](#)
- ▶ For flood risk, prevention is not possible at an individual level, decisions are taken at a town/region level, see [Charpentier et al. \(2021a\)](#)

* study of mathematical models of strategic interaction among rational decision-makers

Pandemics

- ▶ **Tragedy of the commons** (individuals neglect the well-being of society in the pursuit of personal gain, e.g. climate change)
- ▶ Same for pandemics, One can hardly fight a pandemic at an individual level
- ▶ **free-riders** and lockdown, social distancing and vaccines
- ▶ Herd immunity works through an implicit social contract
- ▶ In contagious diseases, the individual choice to take a risk has repercussions on the rest of the community
- ▶ The contagion puts forward a solidarity of another kind than the one promoted by insurance

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