

# Actuarial Sims

Milica Čudina, The University of Texas at Austin

January 31, 2021

# Outline

① A broken arm is a broken arm is ...

② It's all random!!!!!!

③ Turning the tables

Not all losses are made equal



How much?

Ground-up loss



## How much?

- the cost of all the damages to an insured property (house, car, boat)
- health claims
- dental claims
- accidental death riders

...aka **severity**

# When?

At what times do claims happen? Are they clustered?

*Or - for a simpler version ...*

## Number of claims

- in a certain time period
- from a specific group of insureds
- of a specific type

## Number of events

- disasters, accidents, doctor visits, ...

...aka **frequency**

# How long?

## Waiting time

- until a machine breaks down
- until a person retires
- until a person dies

...e.g., **age-at-death**



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# Embracing the risk

- Uncertainty and its financial (and other) consequences cannot be escaped
- Spreading the risk: insurance, re-insurance, etc.
- Charging for protection (the legal way!)

# Harnessing the risk: The mathematical model

## Why?

- insurance premium (price!)
- planning for the future (matching liabilities and revenue)

## Desirable features?

- ...“preserves” the randomness
- ...straightforward to interpret
- ...fairly easy to calculate with

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# The Sims went medieval

...now they go Actuarial

