R in Insurance

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useR! Lightning Talk
11 July 2013
Insurance is not boring
Insurance allows you to take risks
Risk starts with R
Use cases for R

- Pricing
- Reserving
- Capital modelling
- Catastrophe modelling
- Exposure management
Pricing
# Reserving

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Capital modelling

Capital

Premium

Reserves

Claims
Catastrophe modelling

Source: NOAA, http://www.csc.noaa.gov/hurricanes/#app=3d30&3722-selectedIndex=2
Exposure management
THE INSURANCE GAP
When catastrophe strikes, too many countries are unprepared.

2011, THE COSTLIEST YEAR EVER FOR CATASTROPHES, DEMONSTRATES A HUGE GAP

GAP $328BN

INSURED LOSSES $107BN

ECONOMIC LOSSES $435BN

HOW MUCH OF AN ANOMALY? - OUR RESEARCH USES DATA OVER SEVEN YEARS AND SHOWS:

GAP $168BN

ACTUAL INSURANCE $202BN

MINIMUM INSURANCE LEVEL $370BN

STILL A LONG WAY TO GO...

COST OF NATURAL CATASTROPHES

$700BN

$1570BN

1970 - 1980
(10 year moving average)

2001 - 2011
(10 year moving average)

124%

Getting started

- **Using R in Insurance, Presentation at GIRO 2012**
- **R-SIG-Insurance**
- **actuar**: Loss distributions modelling, risk theory (including ruin theory), simulation of compound hierarchical models and credibility theory
- **ChainLadder**: Reserving methods in R
- **copula**: Multivariate Dependence with Copulas
- **cplm**: Monte Carlo EM algorithms and Bayesian methods for fitting Tweedie compound Poisson linear models
- **evir**: Extreme Values in R
- **fitdistrplus**: Help to fit of a parametric distribution to non-censored or censored data
- **lifecontingencies**: Package to perform actuarial evaluation of life contingencies
In the pipeline:

Computational Actuarial Science with R

Edited by Arthur Charpentier
First R in Insurance Conference
Cass Business School
London
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