

# Financial Economics of Insurance Research Topics<sup>1</sup>

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# Climate risk

1. Estimating the relation between climate risk and asset prices.
  - ▶ Stocks (Bolton and Kacperczyk 2021, Engle et al. 2020, Hong, Li, and Xu 2019).
  - ▶ Bonds (Acharya et al. 2022, Goldsmith-Pinkham et al. 2021, Painter 2020).
  - ▶ Options (Ilhan, Sautner, and Vilkov 2021).
  - ▶ Insurance, reinsurance, and catastrophe bonds have relatively pure exposures to climate risk (Tomunen 2021).
2. How does climate risk affect insurance pricing, contract design, and participation in different business lines?
  - ▶ Regulators play an important role by approving rate changes (Oh, Sen, and Tenekedjieva 2021).
3. How do climate stress tests affect the insurance sector and asset prices (Kojien, Richmond, and Yogo 2019)?

# Cyber risk

- ▶ Recent attempts to measure firms' exposure to cyber risk (Florackis et al. 2020, Jamilov, Rey, and Tahoun 2021).
- ▶ Cyber risk is a tail risk with an uncertain loss distribution. Compare with catastrophe insurance, variable annuities, and long-term care insurance.
- ▶ **Question:** Collect data on cyber risk insurance. Does the canonical insurance model explain pricing and contract design?

## Big data and artificial intelligence

- ▶ Big data and machine learning tools may give insurers superior information about the loss distribution.
  - ▶ Life insurers have underwriting data and medical records that allow them to better estimate mortality, lapsation, or surrender risks.
  - ▶ Auto insurers collect driving data from policyholders with tracking devices (Jin and Vasserman 2021).
- ▶ Insurance markets with “inverse selection” (Abrardi, Colombo, and Tedeschi 2020, Brunnermeier, Lamba, and Segura-Rodriguez 2020).
- ▶ **Question:** What are the key predictions of markets with inverse selection and how to test for it?

# InsurTech

- ▶ Big data and machine learning could improve risk pricing.
- ▶ Artificial intelligence could simplify the underwriting process that traditionally involves brokers.
- ▶ Blockchain technology could help automate payments and claims.
- ▶ These innovations may be particularly valuable in emerging economies.
- ▶ **Questions:**
  1. Does InsurTech improve market efficiency?
  2. Does InsurTech reach new customers or simply cream skim existing markets?

## Risk-based capital management

- ▶ Insurers manage their risk-based capital across multiple business lines and risk factors.
- ▶ A capital shock in one subsidiary could affect pricing and contract design in another subsidiary (Ge 2022).
- ▶ **Questions:**
  1. How does an insurer budget risk-based capital across business lines?
  2. How does RBC budgeting affect pricing and contract design?

## Taxation of insurance products

- ▶ Households receive a favorable tax treatment when saving through insurance products.
  - ▶ Life insurance benefits are not taxed (avoiding estate taxes).
  - ▶ Tax deferral on variable annuities.
- ▶ Insurers manage taxes by reinsurance and their domicile choice (e.g., offshore domiciles).
- ▶ **Questions:**
  1. How does the tax treatment affect product design and the relative size of financial institutions (e.g., insurers versus mutual funds)?
  2. How are the tax benefits distributed between insurers and policyholders?
  3. How much of affiliated reinsurance is tax motivated?

## Role of insurance brokers

- ▶ Brokers sell a large share of insurance.
- ▶ Financial advice can be suboptimal (Mullainathan, Noeth, and Schoar 2012, Linnainmaa, Melzer, and Previtero 2021).
- ▶ Financial misconduct is common in insurance markets (Egan, Matvos, and Seru 2019).

Product	Disclosure Type	
	Misconduct	Other Type
Insurance	13.8%	15.2%
Annuity	8.6%	18.6%
Stocks	6.0%	6.3%
Mutual Funds	4.6%	5.9%
Bonds	1.9%	4.5%
Options	1.2%	1.2%
Other/Not Listed	69.9%	55.0%

- ▶ **Questions:**
  1. How are insurance brokers compensated?
  2. How do their incentives affect insurance sales?



## Microfoundations of demand

- ▶ Demand is more heterogeneous and less elastic than that implied by life-cycle models of insurance choice (Kojien, Van Nieuwerburgh, and Yogo 2016).
- ▶ **Questions:**
  1. Why does insurance demand not correlate sufficiently with household characteristics (e.g., wealth, demographics, mortality expectations)?
  2. Why do households not rebalance from life insurance to annuities as they age?
  3. Does insurance demand depend on beliefs, perhaps formed by past experiences?

## Portfolio choice and asset prices

- ▶ Insurers are the largest category of institutional investors in the corporate bond market.
- ▶ Demand system asset pricing (Kojien and Yogo 2019), applied to the corporate bond market (Bretscher et al. 2021)?
- ▶ **Question:** How important are insurers versus other institutional investors in the pricing of corporate bonds?

## Pricing of long-term volatility risk

- ▶ In a large class of asset pricing models, long-term volatility risk is important for risk premia.
- ▶ However, short-term volatility appears to have a higher price of risk (Binsbergen and Koijen 2017, Dew-Becker, Giglio, Le, and Rodriguez 2017).
- ▶ Variable annuities complete the market by allowing households to hedge long-term volatility risk.
- ▶ **Questions:**
  1. How can we estimate long-term volatility risk from variables annuities?
  2. What does the term structure of volatility risk imply for asset pricing models?

## Political economy of insurance regulation

- ▶ Competition between states and countries could lead to regulatory capture and inconsistent regulation.
  - ▶ Shadow insurance (Kojen and Yogo 2016).
  - ▶ Leverty and Grace (2018), Liu and Liu (2019), Tenekedjieva (2021).
- ▶ Differences in accounting standards, risk-based capital regulation, and tax treatments.
- ▶ **Questions:**
  1. Does pricing and the relative size of the insurance sector across countries depend on these differences?
  2. Does regulation affect the distribution of assets versus liabilities across countries for global insurers?

## Optimal regulation

- ▶ Ongoing debate about systemic risk of the insurance sector (e.g., Acharya, Philippon, and Richardson 2016).
- ▶ For banks, short-term risk regulation because of run risk.
- ▶ For insurers with less runnable liabilities, long-term risk regulation is more appropriate (Engle, Roussellet, and Siwardane 2017).
- ▶ However, the long-term risk distribution is unknown, and model uncertainty is important (Hansen and Sargent 2008).
- ▶ **Questions:**
  1. What are the key sources of long-term risk?
  2. How to design macroprudential policies for insurers?