Flood insurance in the Netherlands

Ruben Jongejan & Pauline Barrieu
Outline

• Introduction
• Causes of uninsurability
• Extending the limits of uninsurability
• Insurance and optimal protection
• Conclusions
Introduction: types of flood

- Heavy rainfall
- Failure of a regional flood defense
- Failure of a primary flood defense
Introduction: primary flood defenses
Introduction: historical outline

1953  The Big Flood
1955  The Dutch Association of Insurers forbids its members to underwrite floods
1995  Covenant between the DAI and government dismissed by the Council of State and withdrawn
1998  The DAI lifts its ban because of EU competition law
1998  Calamities Compensation Act (“WTS”) enacted
2004  Borghouts Committee: resolve uninsurability
Causes of uninsurability

(a selection)

1. Concentration
2. Moral hazard
3. Adverse selection
4. Risk perception
1. Concentration

Individual losses are correlated: insurable losses could be in the billions of euros

Reinsurance, securitization (cat-bonds)?

- Reinsurance against low-probability, large-scale losses appears costly
- Capacity of the (re)insurance industry is limited
2. Moral hazard

The insured lose an incentive to avoid losses

But...

Flood safety is publicly provided in the Netherlands

↓

Moral hazard on the part of the government should be addressed
3. Adverse selection

Insurers ending up with portfolios of “bad risks”

Information asymmetries between insurers and the insured?

• Information is public rather than private
• Individuals can hardly influence their exposures
4. Risk perception

People might be reluctant to purchase insurance, even when fairly priced

“It won’t happen to me”
Extending the limits of uninsurability

Government support:

1. Provide underwriting capacity
   Concentration, moral hazard
2. Make insurance (semi)compulsory
   Risk perception (adverse selection)
Extending the limits of uninsurability

Towards a layered program?

1. Self-insurance
   Deductible to reduce ex post moral hazard
2. (Re)insurance
   Or no (re)insurance…?
3. Government support
   Fund build-up, debt issuance
Insurance and optimal protection

\[ \text{Min}(\text{NPV of investment cost} + \text{NPV of expected loss}) \]
Insurance and optimal protection

Min(NPV of investment cost + NPV of expected loss)
Insurance and optimal protection

Perfect insurance:
Cost of risk bearing = Expected loss

Risk neutral optimizations presuppose perfect insurance
Conclusions

• Government involvement is needed to resolve the uninsurability of floods:
  • Provide underwriting capacity
  • Mandate/provide universal coverage

• Insurance and prevention are closely linked
Conclusions

• The introduction of an insurance program cannot be used to justify lower standards of protection

• Current, risk neutral cost-benefit studies seem to yield unduly lenient safety standards
Ruben Jongejan

r.b.jongejan@tudelft.nl
Financial innovations

I: Reinsurance

Geographical diversification, greater extent of pooling

But a 25 bln euro loss would still be huge..

Cat-reinsurance appears costly (market imperfections)
Financial innovations

II: Securitization

Tap into capital markets directly

Daily fluctuations on global asset markets ~100 bln

• Cat-bonds
• Cat-futures and options
Cat-bond

Originator

Premium

Payout when contract is triggered

Special Purpose Vehicle (SPV)

Note proceeds

T-Bonds

Investors

Coupons and/or principal, unless..

Par amount

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Financial innovations

Cat-futures and cat-options (NYMEX, 2007)

- Written on a PCS-index
- Purchase a cat-future: when cat occurs, futures price goes up

But...
- Basis risk: imperfect hedge
- Who are the natural counterparts?
- The CBOT stopped trading these products in the 1990s