

Catastrophic Risks and Insurance Problems and Perspectives

Prof. Alberto Monti

Bocconi University, Milan (Italy)

Email: alberto.monti@unibocconi.it

VI Conference on Insurance Regulation and Supervision in Latin America

Cochabamba, 2 March 2005

CATASTROPHIC RISKS

Different Types

- **NATURAL** (*e.g. hurricanes, windstorms, earthquakes, floods*)
- **ACCIDENTAL MAN-MADE** (*e.g. industrial/technological accidents*)
- **INTENTIONAL MAN-MADE** (*e.g. terrorism*)

TRENDS AND DEVELOPMENT

- **Trend towards:**
 - **INCREASED FREQUENCY**
 - **INCREASED SEVERITY**
- ⇒ According to Swiss Re Sigma (*preliminary estimates*), 2004 is a record year for disaster losses, most of which due to natural catastrophes.

TRENDS AND DEVELOPMENT

TREND TOWARDS HIGHER LOSSES:

- *Rising population densities and value concentrations*
 - *Growing urbanization of exposed areas*
- ⇒ **INCREASED FINANCIAL BURDEN
OF DISASTERS**

2004 SOUTHEAST ASIA TSUNAMI

- ⇒ **One of the worst natural disasters recorded in the past 100 years** (*over 170,000 people lost their lives*).
- ⇒ **Low insurance penetration in the region**
- ⇒ **Estimated total insured losses: USD 4 bn**
 - ⇒ *Property*
 - ⇒ *Life and health*
 - ⇒ *Travel insurance*

INSURABILITY ISSUES

NATURAL CATASTROPHES

- ⇒ LPHC risk
- ⇒ Low predictability (*generalized uncertainty*)
- ⇒ Risk of accumulation (*geographical and inter-temporal spreading problems*)
- ⇒ Adverse selection
- ⇒ Vulnerability
- ⇒ Disaster control and mitigation strategies

INSURABILITY ISSUES

INDUSTRIAL ACCIDENTS

- ⇒ LPHC risk
- ⇒ Information asymmetries:
 - ⇒ Moral hazard
 - ⇒ Adverse selection
- ⇒ Monitoring and bonding devices (*agency costs*)
- ⇒ Evolution of liability laws (*uncertainty*)
 - ⇒ recoverable damages in tort claims
- ⇒ Disaster control and mitigation strategies

INSURABILITY ISSUES

TERRORISM RISK

- ⇒ Increased potential magnitude after 9/11 (*capacity*)
- ⇒ Risk of accumulation (*between insurance lines*)
- ⇒ High level of risk ambiguity:
 - ⇒ Dynamic uncertainty (*adaptive strategies*)
 - ⇒ Information issues
- ⇒ Interdependent security (*externalities*)
- ⇒ CBRN (chemical, biological, radiological, nuclear) attacks (*long term consequences*).

INSURABILITY ISSUES

RISK MODELING

⇒ **Natural Catastrophes:**

⇒ Computer based risk models

⇒ Increased predictability of natural hazards over the past decades

⇒ **Terrorism:**

⇒ Role of experts (*subjective component*)

⇒ Game theory (*adaptive strategies*)

⇒ Evaluation of possible loss scenarios BUT

⇒ Very difficult to estimate frequency

FINANCIAL MARKET SOLUTIONS

Securitization of Catastrophic Risks

⇒ **CAT BONDS** (*natural catastrophes*):

⇒ Evolution of the market since 1997

⇒ New perils / New types of sponsors (but *market remains small*)

⇒ Triggering events (*physical v. loss triggers*)

⇒ Immediate payoff v. Delayed payment

⇒ Credit risk v. Basis risk

⇒ Multi-year coverage at fixed price

FINANCIAL MARKET SOLUTIONS

Special problems for terrorism risk

⇒ **Terrorism risk securitization**

⇒ High level of risk ambiguity (*risk is changing*)

⇒ Multi-event triggers

⇒ Future securitization might mix-and-match different risks to dilute the terrorism component

⇒ GOLDEN GOAL FINANCE Ltd. (*FIFA World Cup – event cancellation*): very low risk

⇒ VITA CAPITAL Ltd. (*mortality risk*)

ROLE OF GOVERNMENTS

in disaster management and compensation

- Disaster prevention and mitigation
- *Ex ante v. ex post* approach to compensation
- Post-disaster aid \Rightarrow Samaritan's dilemma
- Indirect v. direct forms of intervention
 - Government as direct insurer
 - Government as reinsurer of last resort
 - Government as lender of last resort

PUBLIC-PRIVATE PARTNERSHIP

in disaster management and compensation

- **Roles of the public authority:**
 - providing the requisite legal framework
 - subsidizing the cost of administering the disaster management scheme
 - Enforcing preventive and mitigation measures
 - Acting as reinsurer/lender of last resort
- **Roles of the private insurance sector:**
 - proper risk assessment and risk allocation mechanisms
 - expedite loss assessment
 - effective surrogate regulation

NATURAL CATASTROPHES

Examples of institutional arrangements

- **CALIFORNIA:** California Earthquake Authority (CEA)
- **FRANCE:** Cat Nat
- **NEW ZEALAND:** Earthquake Commission (EQC)
- **SPAIN:** Consorcio de Compensación de Seguros
- **TURKEY:** Turkish Catastrophe Insurance Pool (TCIP)
- **USA:** National Flood Insurance Program (NFIP)

TERRORISM RISK

Examples of institutional arrangements

- **FRANCE:** Gareat
- **GERMANY:** Extremus AG
- **ISRAEL:** Property Tax Compensation Fund
- **SOUTH AFRICA:** SASRIA Ltd.
- **SPAIN:** Consorcio de Compensación de Seguros
- **UK:** Pool Re
- **USA:** Terrorism Risk Insurance Act of 2002 (TRIA)

CONCLUDING REMARKS

- Need for an integrated disaster risk management strategy (*public-private partnership*)
- Different institutional approaches
- Risk predictability is a key issue
- Enforcement of structural mitigation and vulnerability reduction measures is also crucial
- *Adverse selection* and *moral hazard* must be limited
- Settlement procedures should be expedite
- Capital markets solutions to increase capacity?

END OF PRESENTATION

Prof. Alberto Monti

VI Conference on Insurance Regulation and Supervision in Latin America

Cochabamba, 2 March 2005