Environmental Risks and Insurance
A Comparative Analysis of the Role of Insurance in the Management of Environment-related Risks

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Environmental Risks
Risks posed by the interaction between human activities and the Environment

• Impact of industrial activities on natural resources
  ➢ Environmental pollution
  ➢ Soil contamination
  ➢ Reduced biodiversity

• Damaging effects of extreme natural events
  ➢ Hurricanes
  ➢ Floods
  ➢ Earthquakes
Environment-related Risks: 
AN INSURANCE PERSPECTIVE

1. Environmental Liability Risk
FINANCIAL RISK ASSOCIATED WITH ENVIRONMENTAL POLLUTION AND CONTAMINATION

2. Natural Catastrophe Risk
RISK OF MAJOR ECONOMIC DAMAGES IN CONNECTION WITH THE OCCURRENCE OF NATURAL DISASTERS, SUCH AS EARTHQUAKES, FLOODS OR OTHER EXTREME ENVIRONMENTAL CONDITIONS

INSURANCE ISSUES :
• POTENTIAL FOR CATASTROPHIC CONSEQUENCES (MAGNITUDE)
• RISK PREDICTABILITY AND CONDITIONS OF UNCERTAINTY
• RISK DIFFERENTIATION AND RISK SPREADING
ENVIRONMENTAL LIABILITY RISK

RISK OF LEGAL LIABILITY:
INFLUENCED BY THE UNDERLYING LEGAL AND REGULATORY FRAMEWORK

- Pollution as a negative externality (private/social costs)
- Different legal approaches:
  - EX ANTE REGULATION
  - EX POST LIABILITY
- Goals of environmental liability:
  - COMPENSATION
  - DETERRENCE
ENVIRONMENTAL LIABILITY RISK LEGAL REGIME

- Strict liability v. negligence
  - LEVEL OF CARE
  - LEVEL OF ACTIVITY

- Direct v. Indirect Protection of the Environment
  - FULL INTERNALIZATION
  - EVALUATION OF NATURAL RESOURCES DAMAGES (NRDs)
  - ADMINISTRATIVE/CRIMINAL LIABILITY FOR CLEANUP COSTS

- Allocation of concurrent liabilities
  - JOINT AND SEVERAL LIABILITY
  - INDIVIDUAL (PROPORTIONAL) LIABILITY
ENVIRONMENTAL LIABILITY RISK
Conditions of Uncertainty

• Level of Factual Uncertainty:
  • SUDDEN/GRADUAL POLLUTION
  • SYNERGETIC POLLUTION (concurrent liabilities)
  • LONG TERM EFFECTS (trigger of coverage issue)

• Level of Legal Uncertainty:
  • FEATURES OF THE ENVIRONMENTAL LIABILITY REGIME
  • INTRINSIC COHERENCE OF THE LEGAL SYSTEM

• Informational Asymmetries:
  • ADVERSE SELECTION
  • MORAL HAZARD
Modern Environmental Insurance

• INTEGRATED RISK MANAGEMENT APPROACH
  – Risk remodeling phase
  – Site-specific / tailor-made coverage
  – Accurate risk classification
  – Loss prevention strategies
  – New trigger of coverage formulas (manifestation/discovery)
  – Crisis management services

• EFFECTS
  – Financial security
  – Ex ante internalization of pollution costs
  – Surrogate regulation mechanism
ENVIRONMENTAL INSURANCE
DIFFERENT PRODUCTS FOR DIFFERENT NEEDS

• First party v. third party coverage
• Known v. unknown pollution
• On site v. off site contamination

• New environmental insurance products on the market:
  – Environmental liability policy (third party)
  – Coverage for on-site cleanup obligations (first party)
  – Cleanup cost cap (brownfield site)
  – Environmental coverage for landfills
  – Combined coverages
ENVIRONMENTAL INSURANCE POOLS
INFORMATION SHARING AND INCREASED FINANCIAL CAPACITY

- **Italy**: Pool RC Inquinamento
- **France**: Assurpol
- **The Netherlands**: Nederlandse Milieupool
- **Spain**: Pool Español de Riesgos Medioambientales
ENVIRONMENTAL LIABILITY INSURANCE

ROLE AND FUNCTIONS:

- Compensation (Judgment proof problem)
- Surrogate regulation mechanism (additional incentives)
- Ex ante internalization of pollution costs (premium)

ALTERNATIVE MEANS OF FINANCIAL SECURITY

- Ex ante deposits
- Guarantee provided by financial institutions
- Compensation funds (tax funded)
PUBLIC POLICY CONCERNS
ENVIRONMENTAL LIABILITY RISK AND INSURANCE

• The limits of liability
  • PAST POLLUTION (NO RETROACTIVITY)
  • CUMULATIVE EFFECT OF AUTHORIZED EMISSIONS
  • DIFFUSE POLLUTION (ABSENCE OF CAUSAL LINK)

• The problem of mandatory insurance
  • BILATERAL OBLIGATION (insurability issues)
  • UNILATERAL OBLIGATION (insurance as environmental watchdog)

• Interaction among regulation, liability funds and insurance
  • MINIMUM LEVEL OF REGULATION (risk insurability)
  • STRICT LIABILITY REGIME (limited scope for risk predictability)
  • COMPULSORY FINANCIAL SECURITY (to be approved by the Authority)
  • COMPENSATION FUND FOR RESIDUAL DAMAGES
NATURAL CATASTROPHE RISK

Market failures in catastrophe insurance
LOW PROBABILITY / HIGH CONSEQUENCES RISK

• Bounded rationality of individuals
• Low level of risk predictability
• Geographical risk spreading problem (cumulative risk in the primary market)
• Limited capacity:
  – magnitude of losses (aggregate claims)
  – inter-temporal spreading problem (mismatch between size of annual premiums and size of expected loss)
• Adverse selection
• Role of the public authority:
  – providing the requisite legal framework
  – subsidizing the cost of administering the disaster management scheme
  – subsidizing the cost of insurance to the beneficiaries
  – being a reinsurer of last resort

• Role of the private insurance sector
  – expedite loss assessment
  – effective surrogate regulation
DISASTER RISK MANAGEMENT STRATEGIES
Examples of institutional arrangements

- FRANCE: National Disaster Compensation Scheme
- SPAIN: Consorcio de Compensación de Seguros
- USA: National Flood Insurance Program (NFIP)
- CALIFORNIA: California Earthquake Authority (CEA)
- FLORIDA: Florida Hurricane Catastrophe Fund (FHCF)
- NEW ZEALAND: Earthquake Commission (EQC)
- TURKEY: Turkish Catastrophe Insurance Pool (TCIP)
NATURAL CATASTROPHE RISKS
RISK SHARING THROUGH CAPITAL MARKETS
Alternatives to traditional reinsurance

• Catastrophe risk securitization
  – Governments
  – Insurers
  – Reinsurers

• Physical trigger v. loss trigger
• Immediate payoffs v. delayed payment
• Credit risk v. basis risk
• Cost of implementing each measure
REGULATION AND CATASTROPHE INSURANCE
Effects on the development of the market

- Regulatory constraints
- Market entry/exit rules
- Financial and fiscal issues
- Regulation of claims practices
- Antitrust and competition policies
Principles of Catastrophe Risk Management

• Integrated approach (public-private partnership)
• Scientific risk estimates
  – Risk predictability
  – Expected loss estimates
• Structural mitigation and vulnerability reduction
  – Building codes and other regulatory measures
• Incentives to minimize:
  – Adverse selection
  – Moral hazard
• Expedite settlements
ENVIRONMENT-RELATED RISKS AND INSURANCE

Concluding remarks

- **Insurance** cannot be considered as a ready-to-use solution to the complex problems posed by the "environmental liability risk" and by the "natural catastrophe risk", but it should be regarded by governments and policy makers as a **precious and valuable instrument in the available array of risk management tools**.