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Climate Insurance Linked Resilient
Infrastructure Finance Working Group

A Blended Finance Approach

Session 1 Pre-Read:

Current Landscape, Catastrophe Bonds,
Insurance Linked Securities,
& Risk Pooling

Session 1
10/14/2020

Objective

Unlocking Public and Private Finance for the Poor

- Provide overview of post and pre-disaster financing options
- Introduction to general insurance value chain
- Overview of ILS products with focus on CAT bond market
- Introduction to catastrophe risk pools

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Overview

Global losses due to natural disasters are rising

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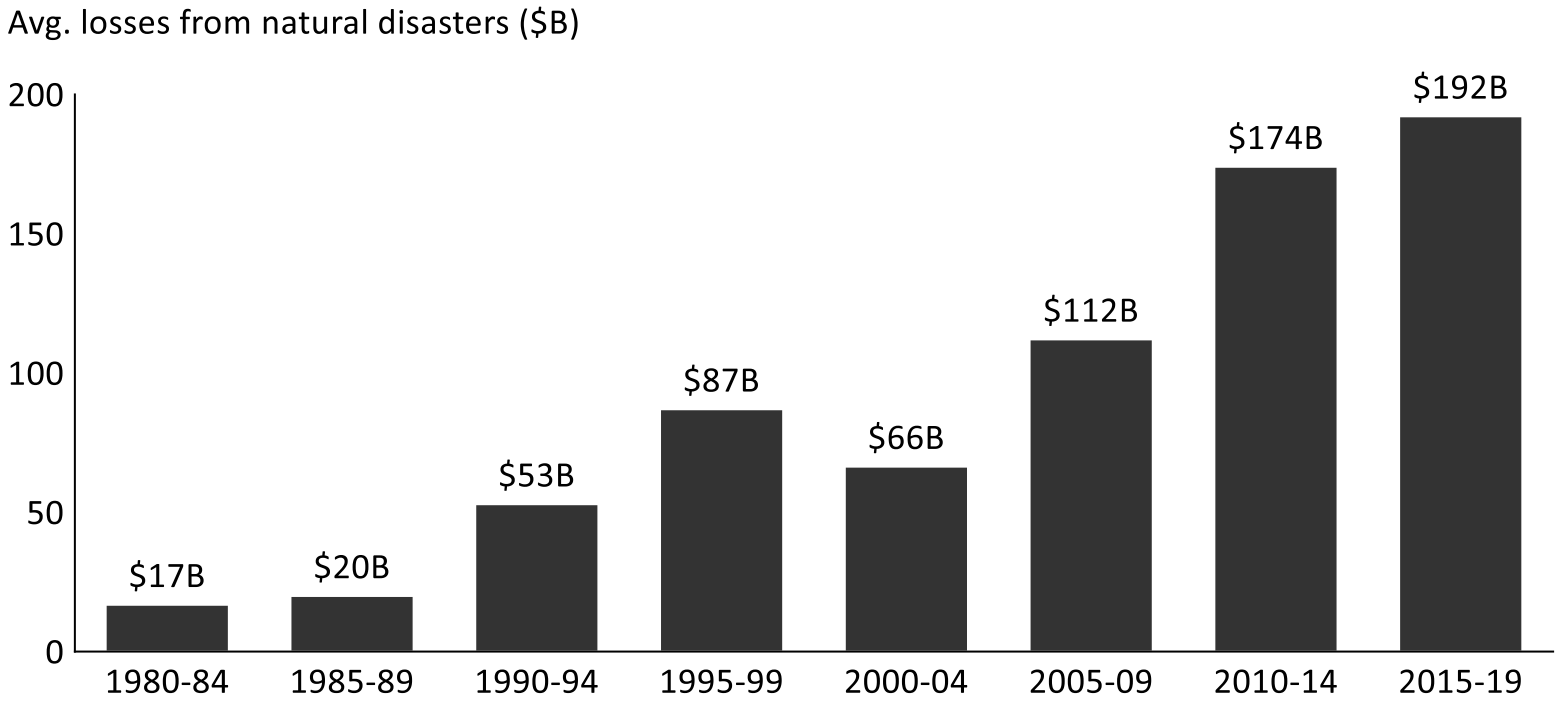
Avg. global losses due to natural disasters have tripled since 2000-2004



Source: Insurance Information Institute, Our World in Data (Links in footnotes)

Observations

- **~$150B in global losses** due to natural disasters in **2019**
- Flooding, storms and earthquakes across Asia resulted in $59B in damages in 2018
- In **2017, hurricanes alone** contributed to **$217B in damages** in the North Atlantic regions

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Pre-disaster financial planning is better than post-disaster recovery for governments

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Pre-disaster financial planning options

- Insurance products
  - Transfer risk of disaster to insurers or reinsurers
- Catastrophe risk pools
  - Diversify risk across countries with different risk profiles
  - Establish joint reserves to self-insure part of risk
  - Transfer excess risk to reinsurance and capital markets
- Contingent loans
  - Typically offered by international financing institutions and multilateral development banks to provide liquidity immediately after a natural disaster
- Contingency/reserve funds

Post-disaster recovery options

- International assistance
  - Takes time to materialize
  - Significant uncertainty as commitments may not match emergency need
- Budget reallocation
  - Negative impacts on long-term development
  - Requires time to assess available resources and build ministerial consensus
- Issue debt
  - Particularly expensive for countries with debt sustainability concerns

Source: World Bank Group (Link)

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Insurance helps transfer risk from citizens or governments to reinsurers and capital markets

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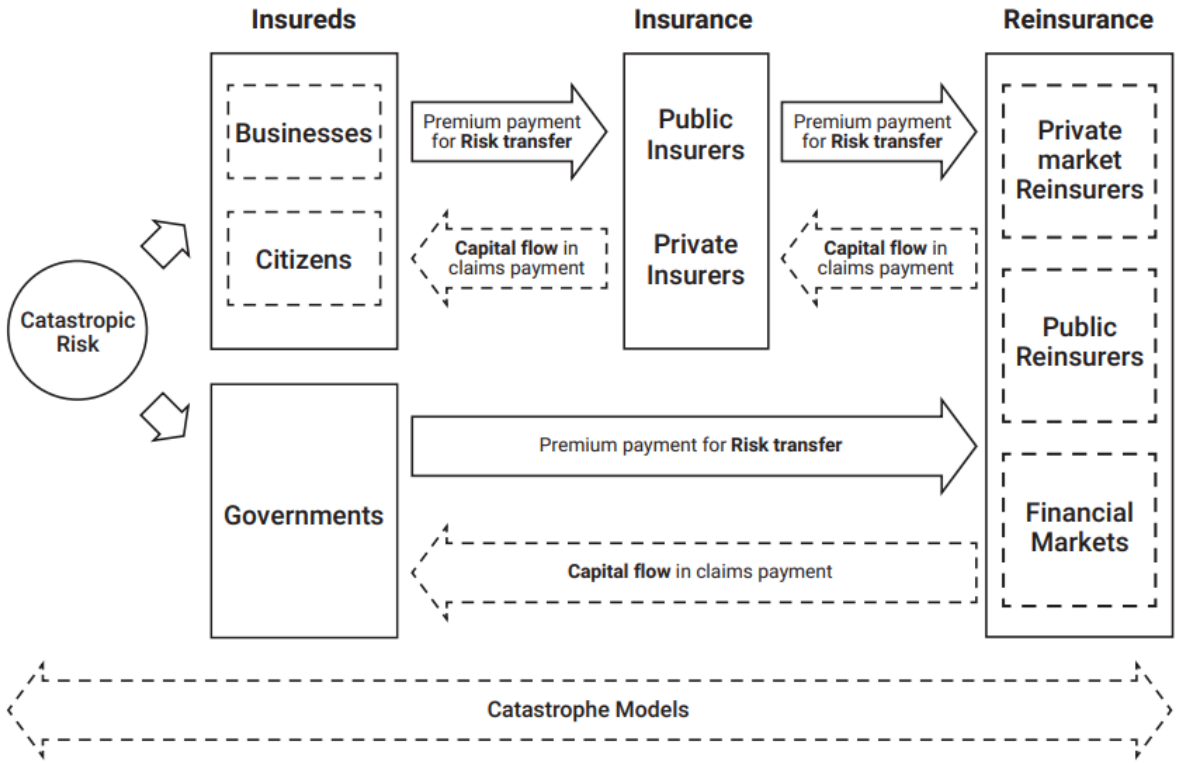
The insurance value chain



Source: Background Paper on Insurance for Climate Adaptation, Cass Business School (Link)

Observations

- Insurers accept risk from insureds, charging them a premium for the service
- Insurers must also protect themselves from having to pay too many claims simultaneously after a catastrophic event
  - In the aftermath of Hurricane Andrew in 1992, 11 insurance companies went bankrupt in Florida after more than 600,000 claims were filed
- Insurers transfer risk to either
  - Reinsurers (traditional reinsurance)
  - Capital markets (Insurance Linked Securities)

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Existing Initiatives

Existing climate and disaster risk financing efforts

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Risk pools and direct insurance providers

- Risk pools
  - Provide insurance to a group of countries / municipalities, usually within a specific region
  - Not-for-profit: goal of risk-sharing, minimizing premiums, and rapid post-disaster liquidity provision

Funds and facilitators

- Activities might include:
  - Financing/co-financing or subsidizing new products, including insurance
  - Risk financing product development
  - Technical support for sovereign risk financing, post-disaster response, and/or mitigation efforts

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Existing climate and disaster risk financing efforts

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Donors and partners: World Bank, KfW and BMZ, Governments of US, UK, Japan, others

Technical Assistance / Market & Product Research Only

InsuResilience Solutions Fund

Risk Assessment Only

RIICE

CREWS

Private risk assessment/modeling services

Financing, co-financing, insurance market and product facilitation

GFDRR

InsuResilience Investment Fund

GRiF

GIIF

DRFI

Risk Pools and Direct Insurance Provision

CCRIF

ARC

PCRAFI

Platforms / Coordination

InsuResilience Global Partnership

World Bank

Categories are not mutually exclusive. E.g., most risk pools have internal risk assessment ability and provide member countries with technical assistance.

Existing climate and disaster risk financing efforts

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Group	Group type / activities	Climate or disaster focus?	Micro- or macro-insurance focus?	Risk assessment?	Adaptation/ mitigation?	Focus on infrastructure?	Insurance provider?	Insurance and adaptation/mitigation integrated?	Parametric insurance?	Policy length	Payouts to date (millions of USD)
GRiF (Global Risk Financing Facility)	(Co-) financing, some technical assistance	Both	Macro	No	No	No	No				
GFDRR (Global Facility for Disaster Reduction and Recovery)	(Co-) financing, technical assistance	Disaster	Both	Yes	Yes (Both)	Yes	No				
ISF (InsuResilience Solutions Fund)	Risk assessment, product development	Climate	Both	Yes	No	No	No				
ACliFF (Asia-Pacific Climate Finance Fund)	(Co-) financing, product development	Disaster	Both	No	Yes (Mitig.)	No	No				
IFF (InsuResilience Investment Fund)	(Co-) financing, market and product development, technical assistance	Climate	Micro (mostly)	No	No/ minimal	No	No				
DRFI (Disaster Risk Financing and Insurance Program)	(Co-) financing, market and product development, technical assistance, risk assessment	Disaster	Both	Yes	No	No	No				
PCRAFI (Pacific Catastrophe Risk Assessment and Financing Initiative)	Disaster insurance provider, risk assessment, technical assistance	Disaster	Macro	Yes	Yes* (Adapt.)	No	Yes	No?	Yes	1 year	3.2
ARC (African Risk Capacity)	Risk pool, climate insurance provider, risk assessment, technical assistance	Both	Macro (mostly)	Yes	Yes (Adapt.)	No	Yes	Yes**	Yes	1 year, 5 years	102
CCRIF (Caribbean Catastrophe Risk Insurance Facility)	Risk pool, technical assistance	Disaster	Macro (mostly)	Yes	Yes (Adapt.)	No/ minimal	Yes	No	Yes	1 year	152
GIIF (Global Index Insurance Facility)	Market development, technical assistance	Disaster	Micro	No	No	No	Yes	No	Yes		

* Through the Pacific Resilience Plan
** Preliminary efforts in the new XCF (Extreme Climate Finance) program

Where does long-term insurance fit in to the disaster finance framework?

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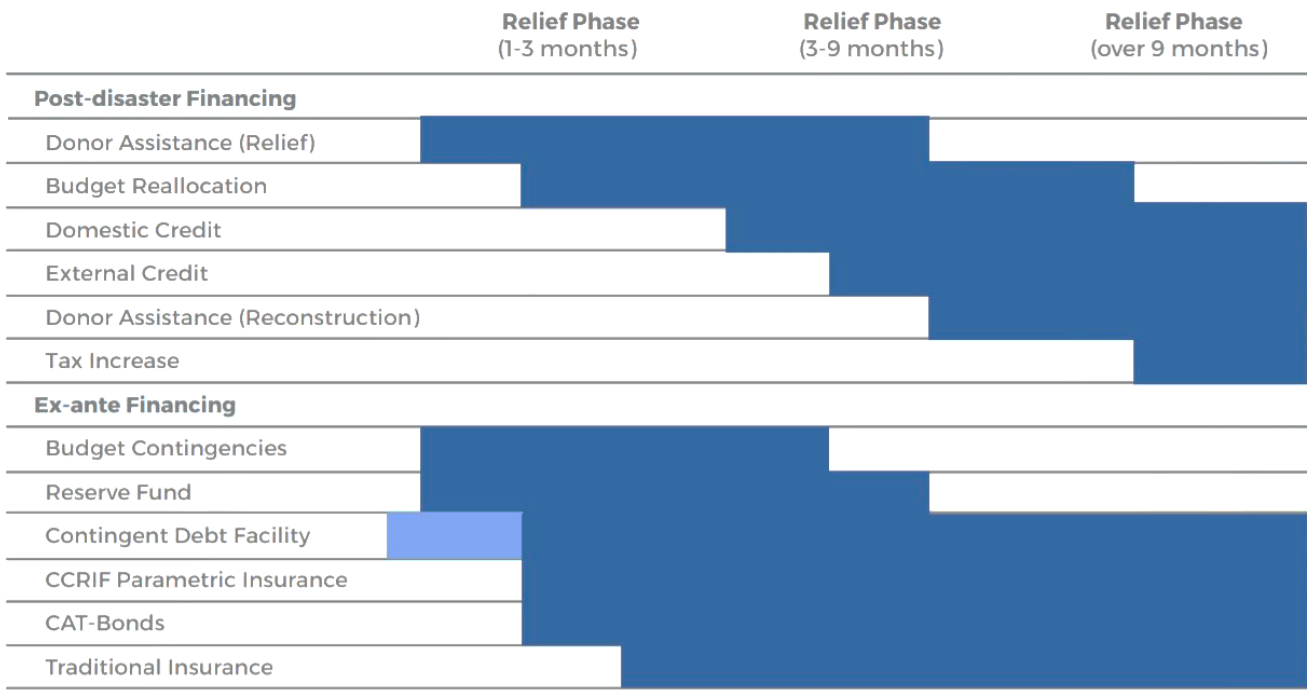
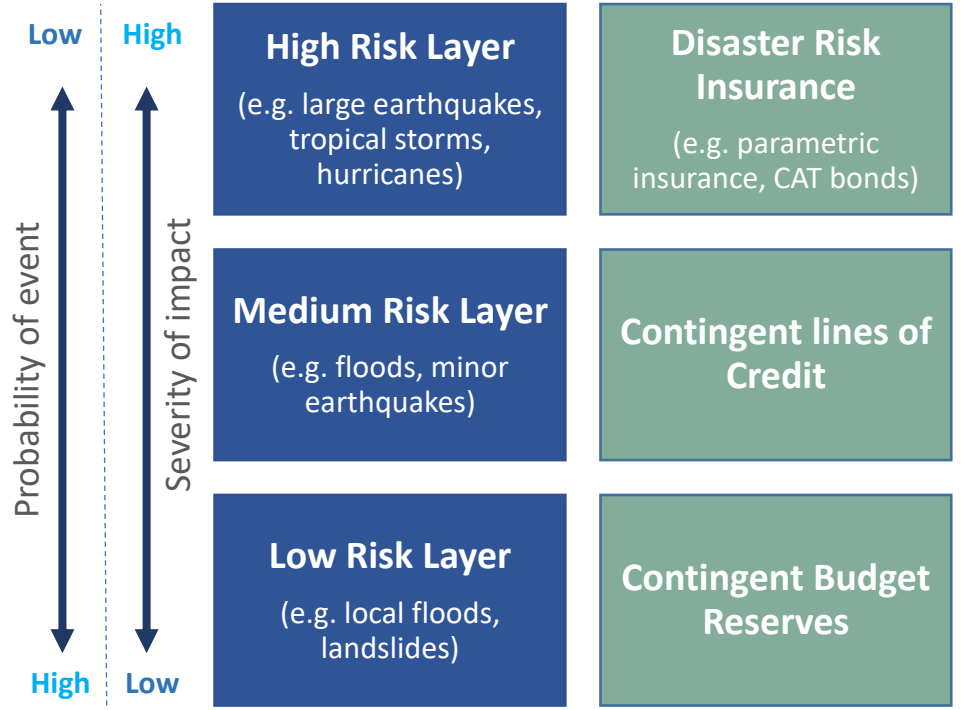
Speed of payout, post- versus ex-ante financing

The diagram below shows the speed of payout of different risk financing instruments.



Risk layer



Source: CCRIF SPC 2019

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Innovative Financial Products

Insurance-Linked Securities, Catastrophe Bonds, & Risk Pooling

ILS products have multiple advantages over traditional reinsurance

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Traditional Reinsurance vs. Insurance Linked Securities

- ILS provide insurers with access to new pools of capital distinct from traditional reinsurers
  - Money managers, hedge funds, and pension funds
- ILS virtually eliminate of credit risk
  - Since investor capital sits in a segregated collateral account, availability of dedicated funds is ensured in case an event occurs
- ILS allow multi-year risk transfer to insurers
  - Most CAT bonds have a maturity of 3-5 years
  - Traditional reinsurance contracts are renewed annually
- ILS products allow investors to access an asset class with low beta in relation to other portfolio components, such as equity market fluctuations, credit, and interest rate fluctuations
  - Occurrence of natural catastrophes is in general uncorrelated with events in the broad economy (i.e. change in oil or gold prices does not cause earthquakes or floods)

Source: CAIA Association (Link)

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CAT bonds constitute the most well-known ILS segment

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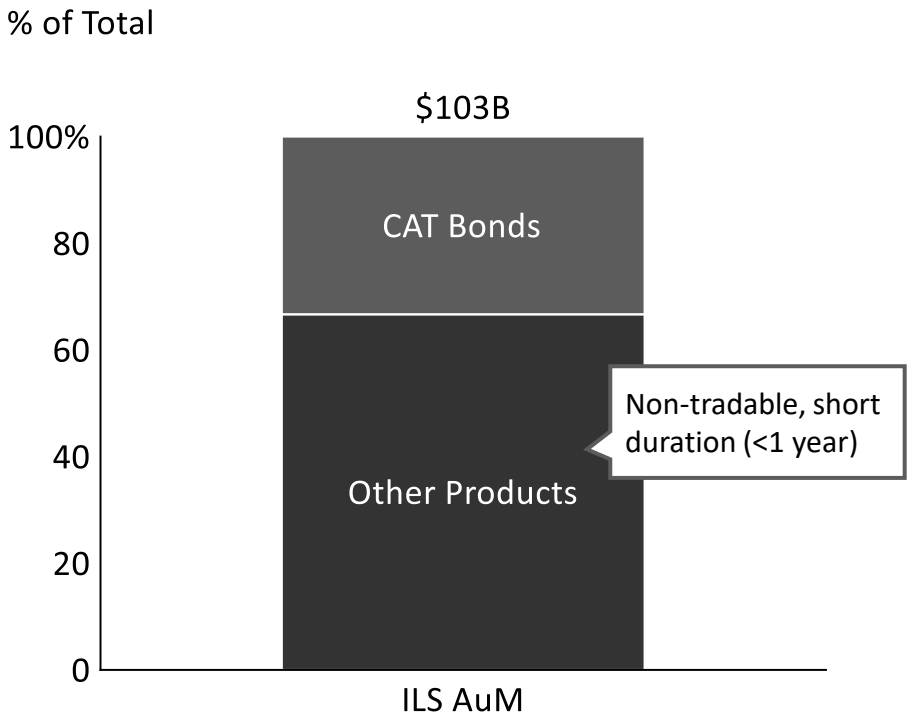
CAT bonds constitute one third of ILS market



Source: Artemis ILS Deal Directory (Link)

Observations

- CAT bonds are conventionally tradeable and normally have a life span of between three and five years
  - Serve to reduce insurers' and reinsurers' reserve requirements
- Other products include non-tradable, "over-the-counter" contracts, mostly with a 12-month lifespan
  - Require managers to model risks themselves
  - No secondary market
  - Non-tradeable nature leads to additional "illiquidity premium"

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CAT bond triggers define the conditions for payout of principal

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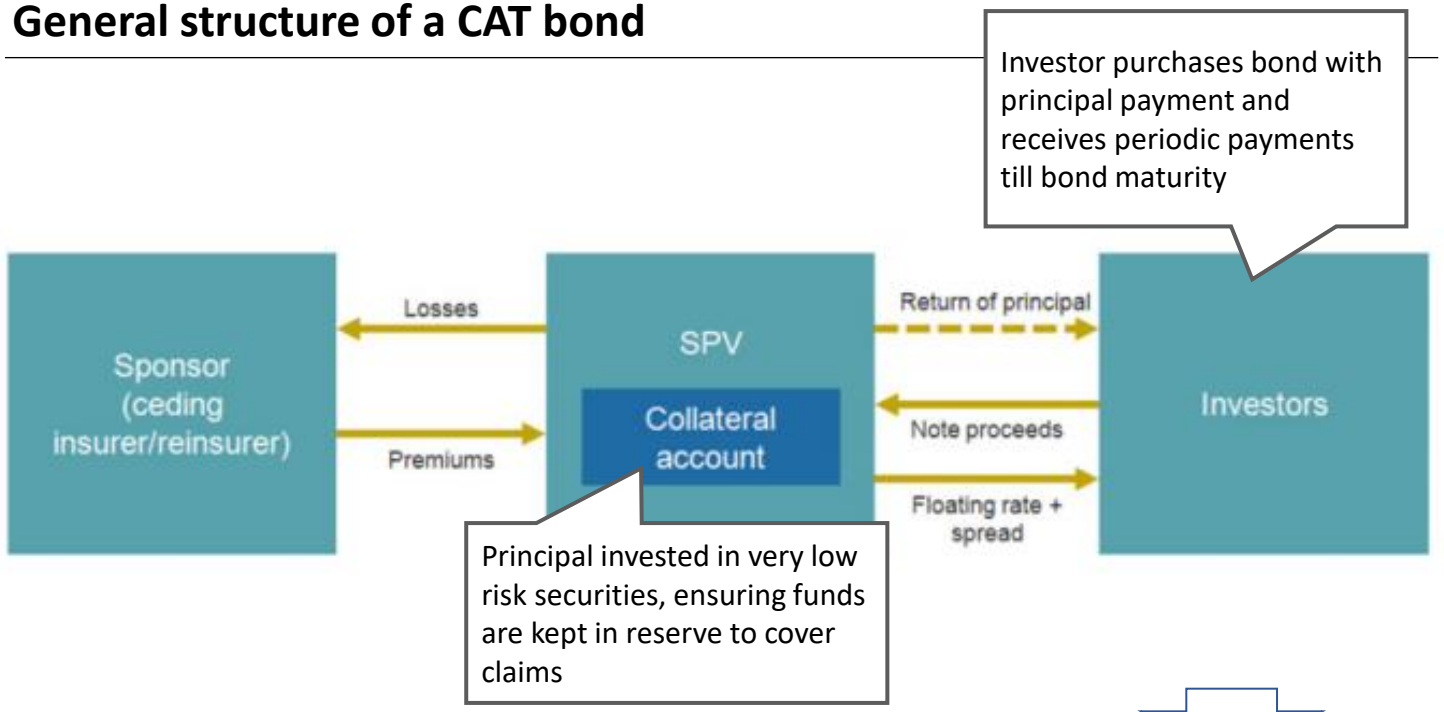
General structure of a CAT bond



Observations

- Payments to investor consists of policy holder premiums and returns from investment of principal
- The **principal amount can ONLY be used** by the **insurer/reinsurer in case bond is triggered**
- CAT bond trigger defines events under which bond defaults and principal amount is used to cover issuer's indemnities

Could principal amount be used for resilient infrastructure development (even without triggering of bond)?

Source: Background Paper on Insurance for Climate Adaptation, Cass Business School (Link)

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Potential triggers for long-term insurance

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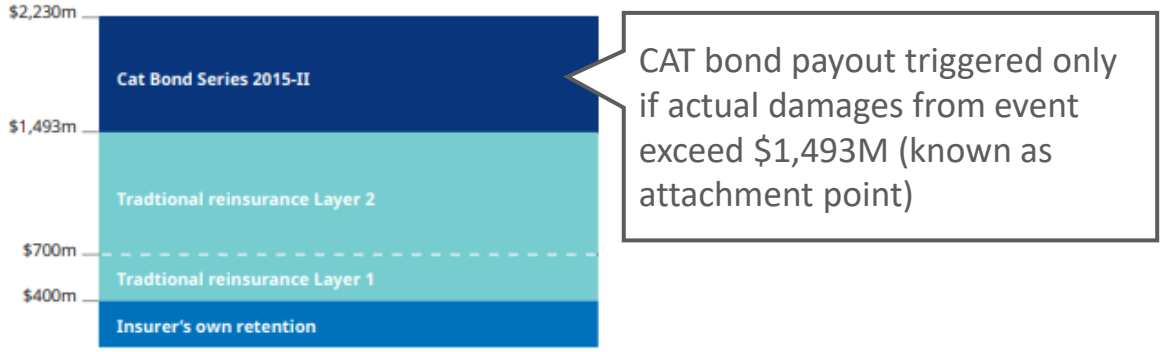
Indemnity/Industry loss trigger

- **Payout based on actual claims processed** by issuer or overall industry-losses due to extreme event
- Attractive to issuer (insurers) due to **low basis risk** (payout same as actual claims from policyholders)
- Least attractive to **investor due to long waiting times** (principal returned only after settlement of filed claims)

Figure 2: Cat bond example: simplified reinsurance programme



Parametric trigger

- **Based on occurrence of a defined natural event**
  - Wind speed exceeding a certain limit
  - Rainfall exceeding a certain threshold (daily or cumulative)
  - Earthquake of a given magnitude
- **Poses basis risk** to issuer as payout could be less than or more than actual damages
- Advantageous to **investor** because **little or no waiting time is required before settlement** of the bond after a triggering event
  - Resolution of losses is rapid and transparent
  - Does not require adjudication through claims adjustment process

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What are the barriers to long term CAT bond issuance in developing countries?

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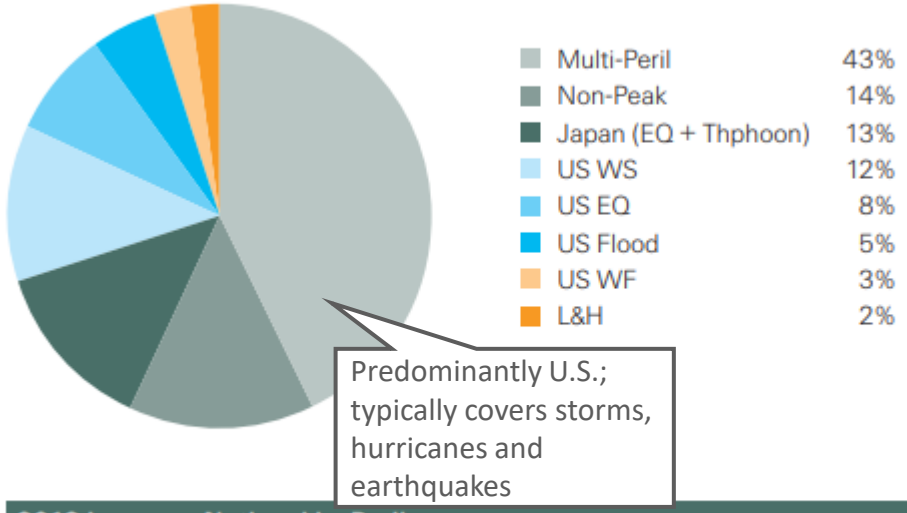
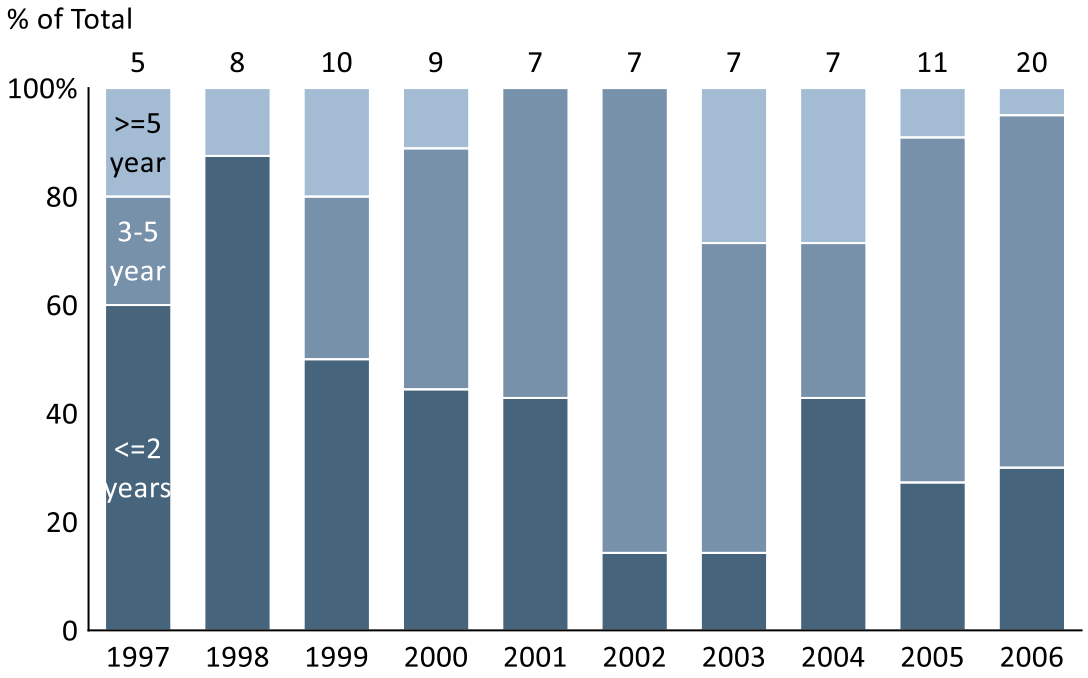
2018 CAT bond issuance by peril type



2018 Issuance Notional by Peril

	Multi-Peril	Non-Peak	Japan	US WS	UW EQ	US Flood	US WF	L&H
USD (m)	4 150	1 360	1 220	1 179	760	500	325	200

Historical CAT bond issuance by maturity period



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Source: 2019 ILS market update – Swiss Re (Link); Wharton Risk Center Extreme Events Project (Link)

Catastrophe Risk Pools

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Overview

- General objectives:
  - Disaster risk-sharing between countries in a geographic region
  - Reduction of immediate financial impact of disasters; rapid access to financial relief
  - Charge lowest-possible premiums while maintaining long-term sustainability of insurance
    - Establish joint reserves to self-insure part of risk
    - Transfer excess risk to reinsurance and capital market
- Operate via parametric policies renewed (mostly) on an annual basis
- Capitalized by development banks, donor countries, and membership fees
- Prominent examples:
  - African Risk Capacity (ARC)
  - Caribbean Catastrophe Risk Insurance Facility (CCRIF SPC)

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Risk Pools: prominent examples

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Caribbean Catastrophe Risk Insurance Facility (CCRIF SPC)

- First insurance instrument to successfully develop parametric policies backed by both traditional and capital markets
- Capitalized by Multi-Donor Trust Fund sponsored by World Bank, EU, other governments and development banks
- ~USD $150 million in payouts since 2007
- Some small adaptation projects, which are not linked to insurance program

African Risk Capacity (ARC)

- Capitalized by DFID and KfW
- USD $102 million in payouts for drought since 2014
  - Policies renewed annually for each agricultural season
- ARC Extreme Climate Facility (XCF) – *Design and implementation in progress*
  - Index based, multi-year financial vehicle to track frequency and magnitude of extreme weather events in Africa and provide additional financing for countries
  - 30-year term broken down into 5-year policies triggered by increases in frequency of extreme weather events
  - Payouts intended to finance climate adaptation

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Case Study: Example of PPP to increase insurance penetration in emerging economies

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Turkish Catastrophe Insurance Pool (TCIP)

- Established in 1999 to serve large share of population living in earthquake-prone areas
  - Persistent potential for large-scale natural disasters became a fiscal and social issue for the Turkish government
- Main **rationale for creation** of TCIP was very **low level of catastrophe insurance penetration** among households
- Genuine public-private partnership
  - **All business functions**—from sales to reinsurance to claims management—**subcontracted to private insurance industry**
  - **Government's role limited to enforcing compulsory earthquake insurance** for all urban dwellings and providing contingent liquidity support in case of TCIP's insolvency
- Program provides earthquake **insurance coverage to approximately 4.5M Turkish homeowners** (corresponding to approximately **30% of insurable housing stock**)
- Program also provides incentives for local builders to comply with the construction code as TCIP does not provide insurance coverage for any buildings that do not carry valid construction and occupancy permits

Source: World Bank Group (Link)

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Lessons from risk pools for long-term insurance

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Lessons

- **Diversifying across geographic areas is crucial** to minimizing overall disaster risk and cost of reinsurance
- **Rapid liquidity following a disaster** is the main value for member country governments
- Most risk pools have **internal disaster risk-modelling capability**
- CCRIF SPC as a model for risk segregation

Weaknesses / differences

- Most **policies are renewed annually**
- Heavily **subsidized by aid**; premiums are kept as low as possible
- Few or no incentives for adaptation/mitigation (all products are parametric)
- Risk modelling and **technical assistance are also heavily subsidized by aid**

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Conclusion

Market Gaps

Gaps in the current landscape

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Existing insurance products do not fill the following gaps, leaving room for a potential climate-linked product

- Most markets lack access to long-term solutions, with CAT bonds lasting $\leq$ 5 years and most other products renewing or expiring after 12 months.

- Existing products and services are generally reactive rather than preventative, and do not incentivize investment in green or climate-resilient infrastructure

- There is limited experience modeling relevant risk in developing economies, slowing insurance uptake in these regions


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