Food Security Catastrophe Bonds

26 April 2013

Presentation overview

- **During major natural disasters, humanitarian financing is often slow and inadequate**
- **Food Security Catastrophe Bonds (FSCs) provide flexible and scalable market-based insurance for humanitarian crises**
- **Food Security Catastrophe Bonds (FSCs) provide attractive and uncorrelated returns to investors**

During major natural disasters, humanitarian financing is often slow and inadequate

Dai Kurokawa / EPA

The Australian

Thomas Mukoya / Reuters

Donor Government

↓ $$

Relief Agency

↓

Affected Population

Problem 1 – Speed
Traditional disaster relief can <u>lag behind needs</u>, leading to <u>long-term harm</u>

Problem 2 – Capacity
Traditional disaster relief depends on donors with <u>limited funding</u>

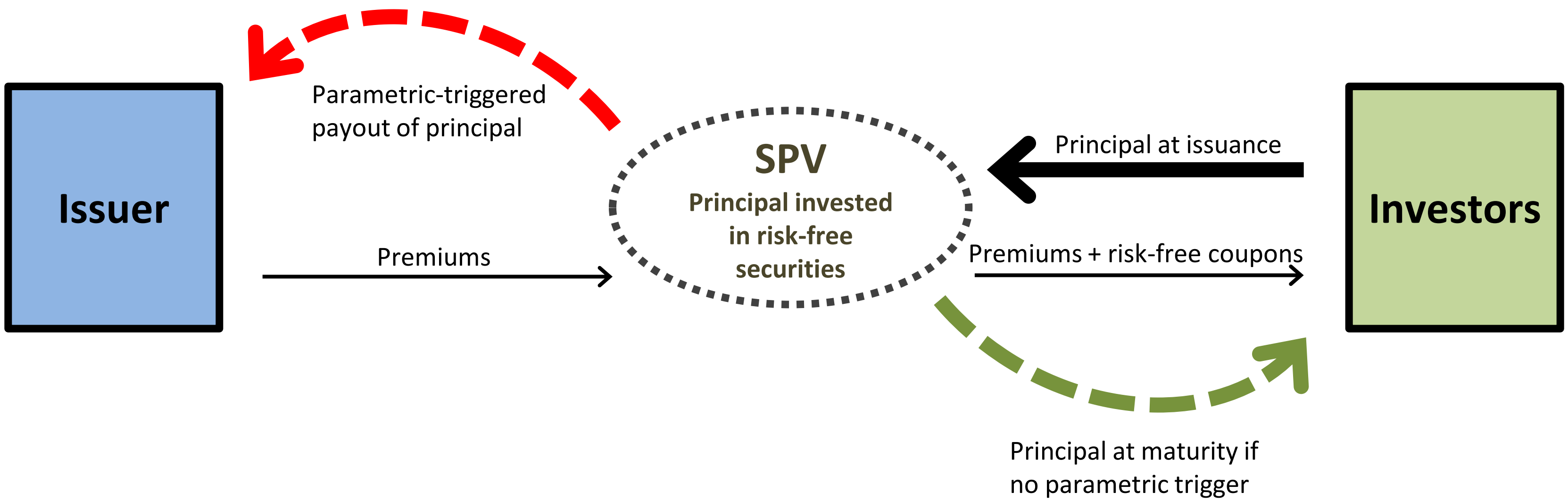
Food Security Catastrophe Bonds (FSCs) provide flexible and scalable market-based insurance for humanitarian crises

Washington Post / Reuters

- **Guarantees funding for humanitarian responses to**
  - a combination of natural disasters
  - a rare catastrophic natural disaster

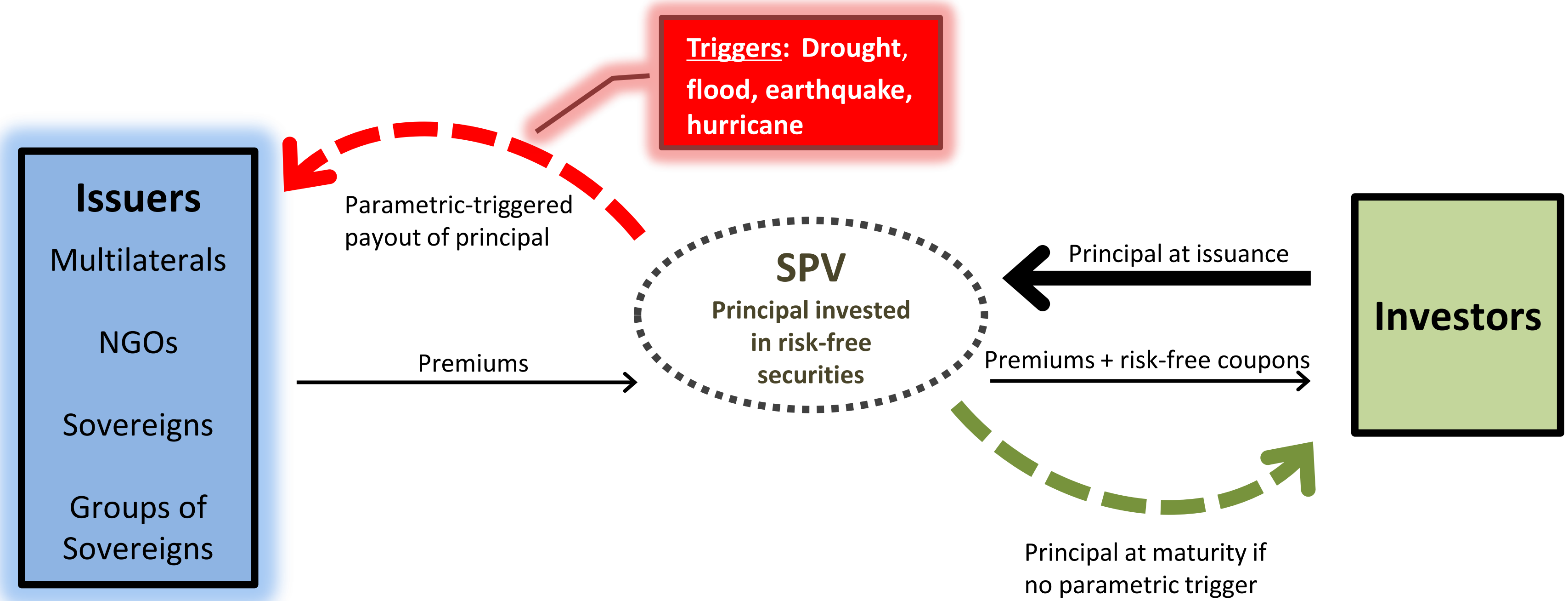
- **Cost-effective and efficient risk transfer for humanitarian agencies**
  - increases response speed
  - saves lives and money
  - reduces uncertainty and dependency

Catastrophe bonds provide market-based insurance for natural disasters



FSCs apply the CAT-bond structure to a new use

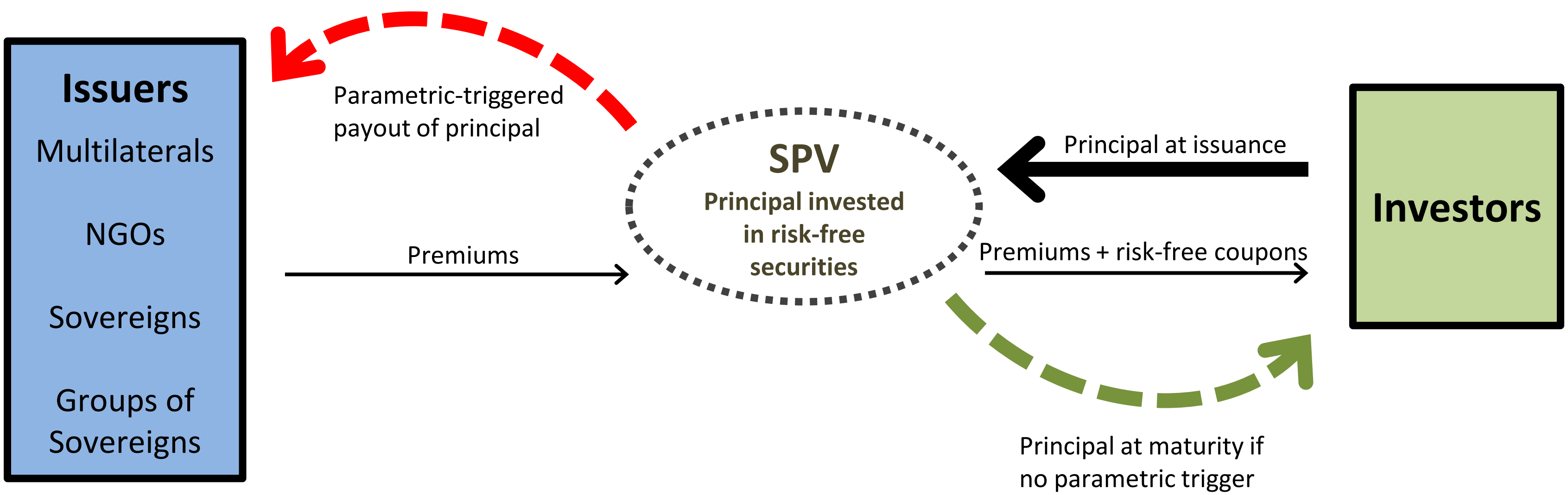
- **Innovation:** Using CATs to finance responses to humanitarian crises
- **New Triggers:** Natural disasters that cause humanitarian crises
- **New Issuers:** Those financing humanitarian responses



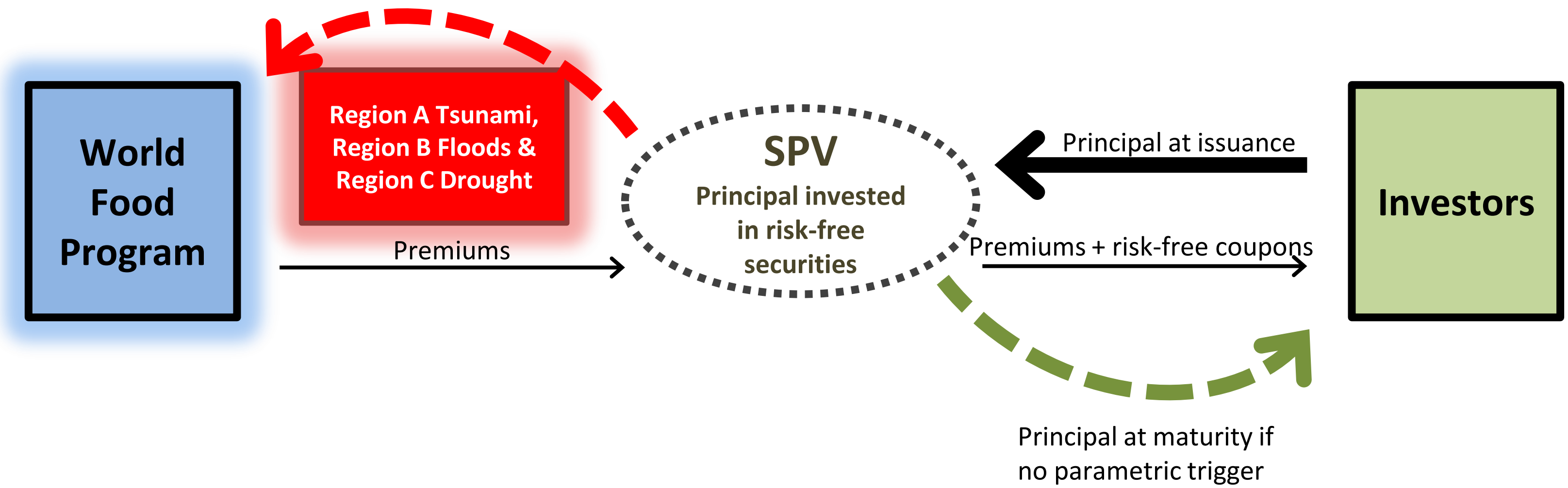
FSCs utilize a proven and attractive structure

- **Issue Size:** $50 - $300 million
- **Maturity:** 3-5 years
- **Fees:** ~150 basis points

- **Pricing and Returns**
  - **Coupon** = risk-free + premium
  - **Premium** = annual expected loss * multiple (2-5)
  - **Return Range**: 2% - 12%



FSCs are adaptable and scalable to multiple issuers and disasters



- **Can be tranched based on different thresholds to meet different issuer needs and investor risk/return profiles**

Tranche A: $100 Million	• Triggered if 2 of 3 events occur • Annual expected loss is 4%, premium is 12% with multiple of 3
Tranche B: $100 Million	• Triggered if all 3 events occur • Annual expected loss is 1%, premium is 3% with multiple of 3

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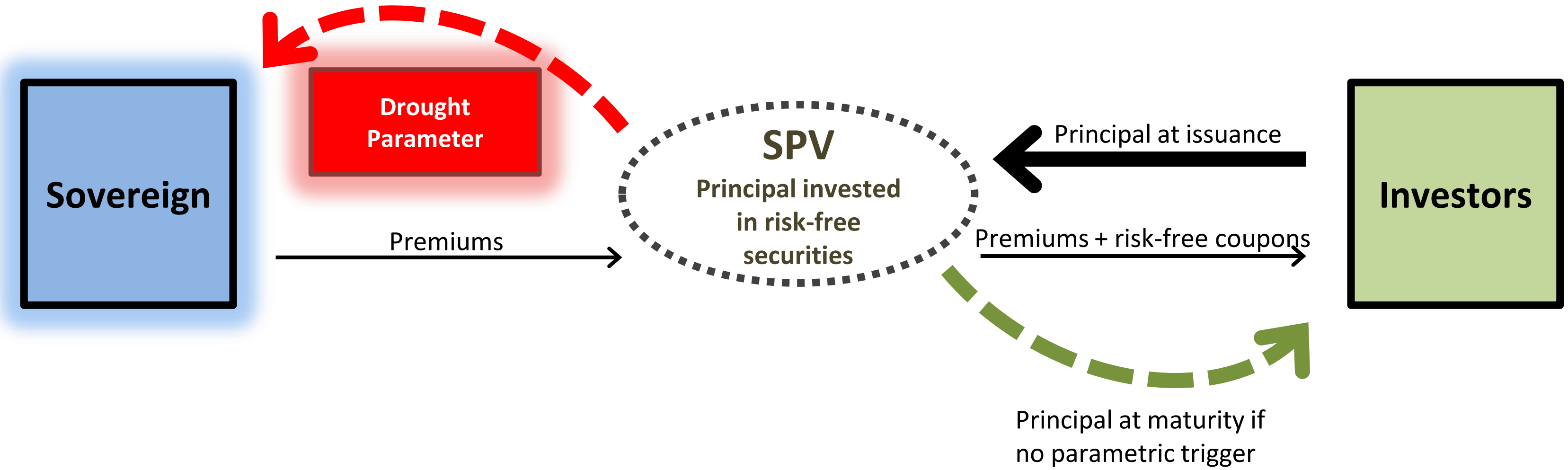
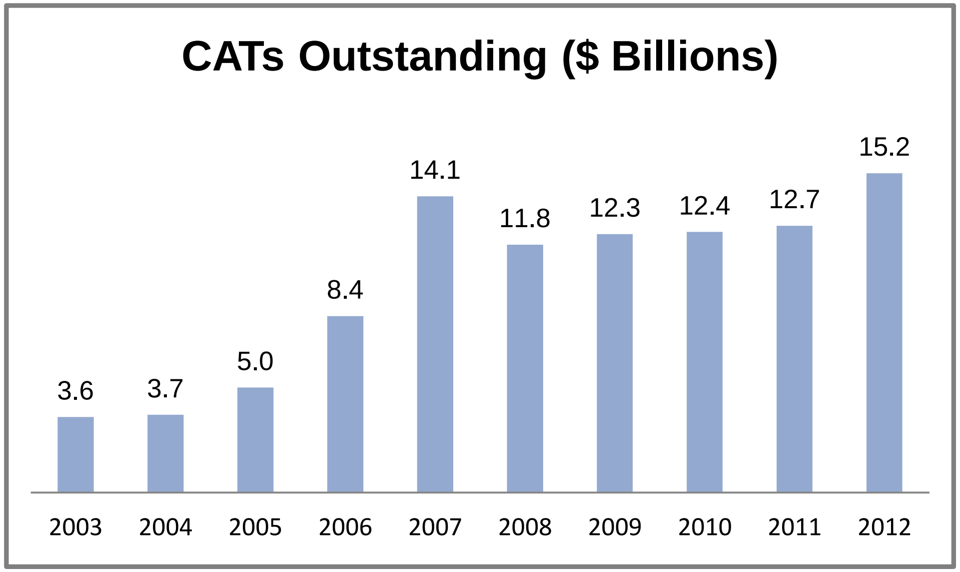
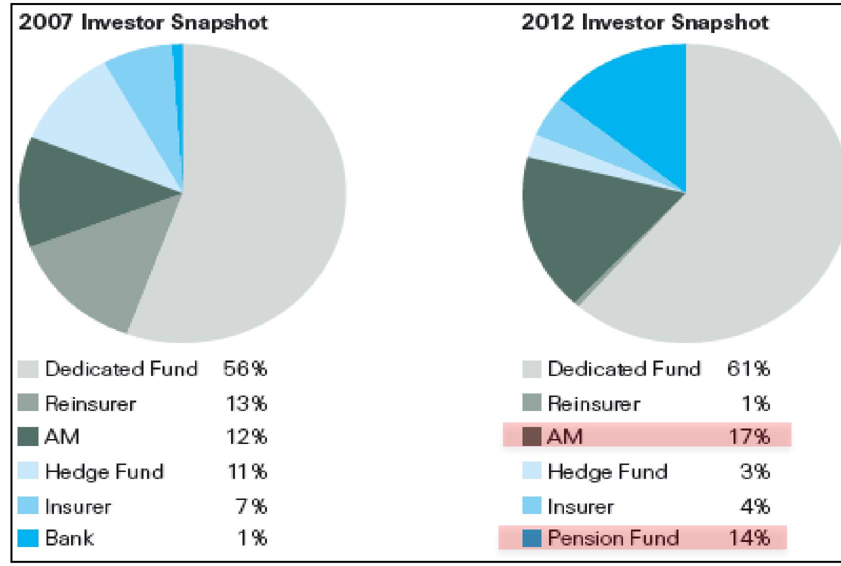


Tranche A: $50 Million	• Triggered by 1-in-50 year drought • Annual expected loss is 2%, premium is 6% with multiple of 3
Tranche B: $100 Million	• Triggered by 1-in-100 year drought • Annual expected loss is 1%, premium is 3% with multiple of 3

Mainstream investors are moving into CATs



Source: Willis Capital Markets & Advisory



Source: Swiss Re Capital Markets, via Artemis.bm

Traditional Purchasers

- Hedge Funds
- Specialist Managers

New Purchasers

- Pension Funds
- Asset Managers

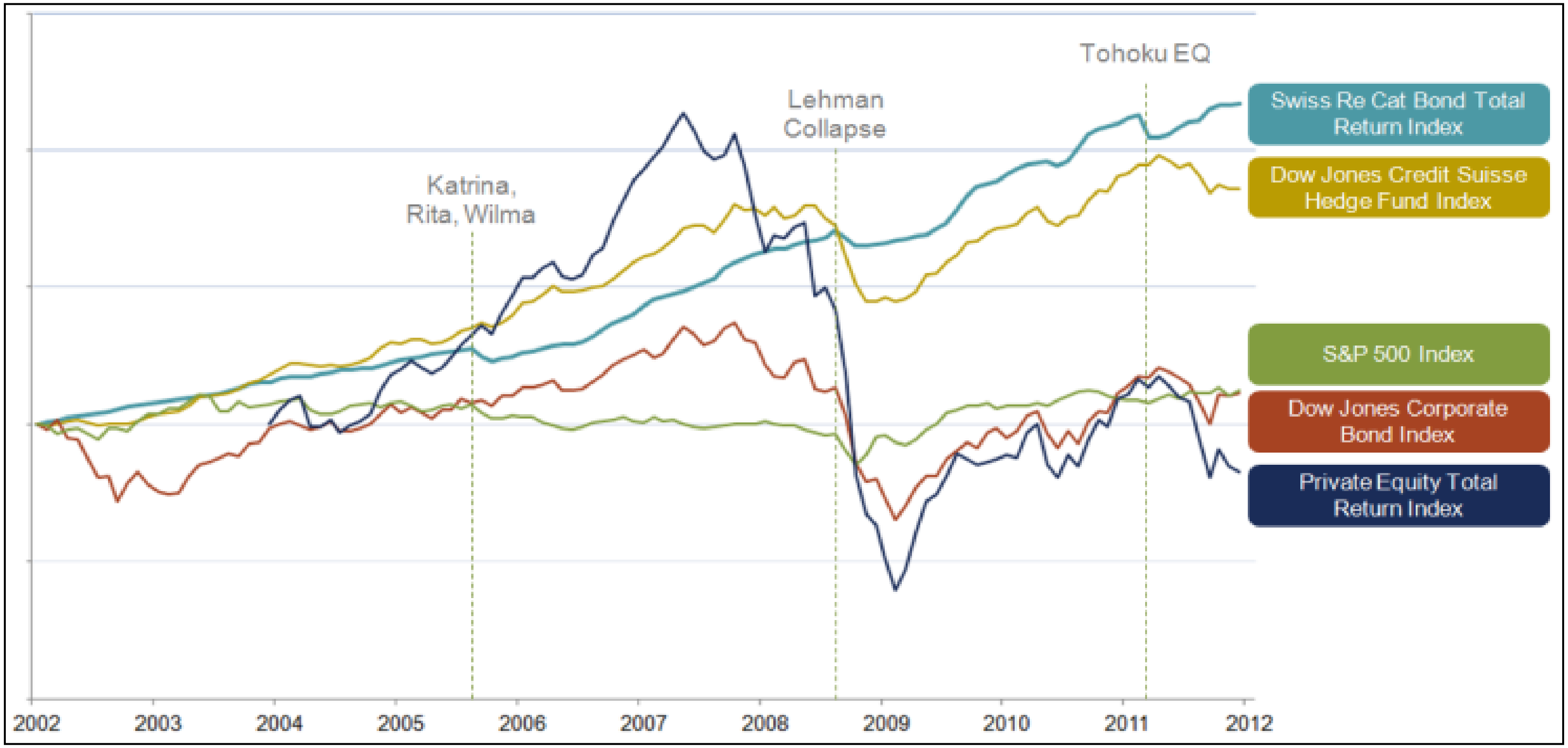
TEACHERS' PENSION PLAN ONTARIO

TIAA CREF

PGGM

NEW ZEALAND SUPERANNUATION FUND

FSCs provide attractive, uncorrelated returns to investors



Source: Risk Management Solutions

- Average annual since 2002**: 7.98%**
- Insurance linked securities (ILS) are **low beta investments**:

	S&P 500	Government Bonds	Corporate Bonds
ILS	0.12	0.06	0.10

Range: 2001-2010, Source: BFinance

FSC risks are clearly defined and manageable

MODELING RISK

That the model inaccurately captures the event’s probability

CONSERVATIVE MODELS

Of the 210+ CATs ever issued, CATs have only been triggered twice (Katrina, Tohoku EQ)

CREDIT RISK

That the issuer misses a premium payment

PROTECTED PRINCIPAL

The principal is held in the SPV, and reverts to the investor

CLIMATE RISK

That global warming is affecting global climate patterns

SHORT MATURITIES

3 – 5 year maturity allows for models to be updated

BASIS RISK

That the financing secured is too little or too much

STILL BENEFICIAL

Ex-ante financing still quickens and lowers cost of response, even if more funds needed

The CAT market is ready for the FSC

"Traditionally conservative investors such as **pension funds** and life insurers were increasingly becoming **an alternative to reinsurance providers**." - Financial Times

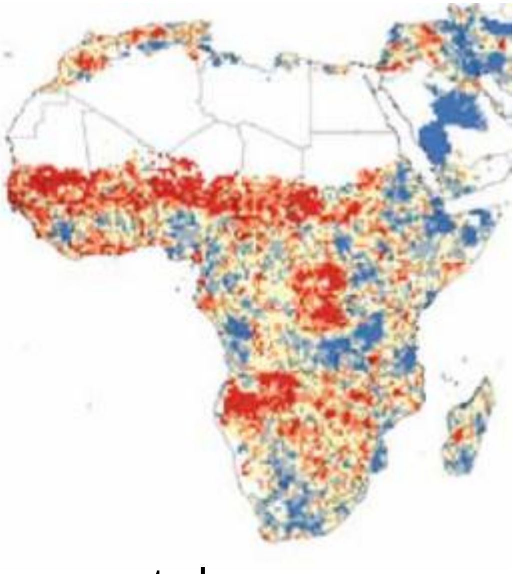
"One area with great potential is innovation on risks covered by bonds or **new trigger formats** – perhaps new bonds covering marine, aviation, **agriculture**. Why not Pakistani or Thai flood exposure?" – Sandro Kriesh, Twelve Capital

Entry of New Investors → **Market Demand** → **New Triggers** → **New Regions** → **FSC Bonds**

"Increased interest from pension funds and other investors had meant that demand was beginning to outstrip supply. As a result, it is **time for issuers to get creative.**" – E Financial News

"The Bosphorus Re 1 Ltd. parametric CAT bond, being issued on behalf of the **Turkish Catastrophe Insurance Pool (TCIP), has increased in size by 150%** while the price guidance has dropped to below the bottom end of the marketed range." - ARTEMIS.bm

The FSC matches investor demand with issuer need to save lives and insure economic growth



- **Feasible:** Meets needs of issuers and institutional investors through scalable structure and tranching
- **Innovative:** Brings insurance-linked securities and alternative risk transfer to impact investment
- **Creative:** Combines new triggers and new types of issuers
- **Thorough:** Uses a proven structure and is part of a growing asset class
- **Impactful:** Finances responses to humanitarian crises, saving lives and limiting long-term economic harm

APPENDIX

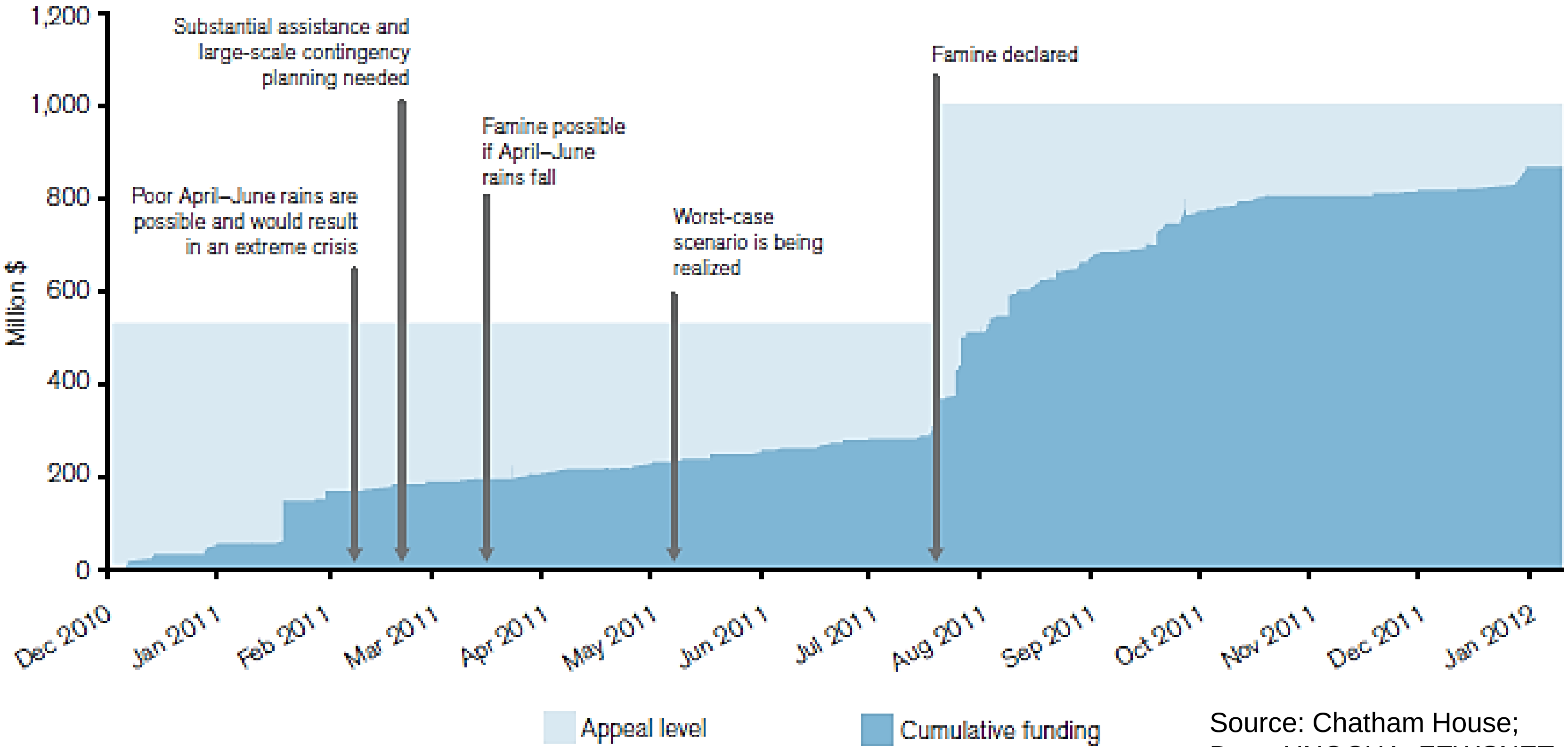
Bringing diverse experience to a complex problem

- 3 years working with sovereign wealth funds at Amundi Asset Management and Columbia University
- Summer 2013: World Bank

- 3 years at Nomura Asset Management as an emerging markets' sovereign and corporate debt analyst
- Summer 2013: OPIC

- 5 years in management of humanitarian operations in Africa and Central Asia
- Summer 2013: Financial sector development consulting

2011 East Africa drought: cost and response time



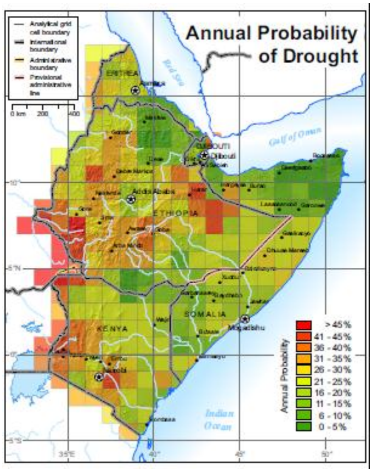
Source: Chatham House;
Data: UNOCHA, FEWSNET

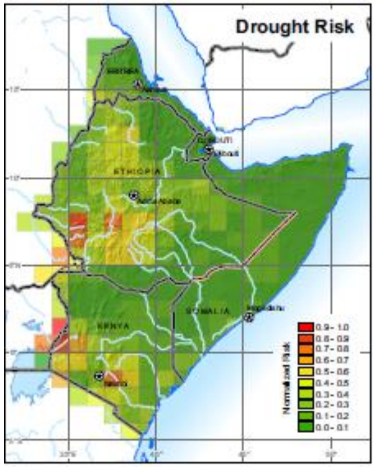
- **UN:** *"Worst drought in 60 years"*
- Cost of response drastically increases with delay

Population at risk:	10 million (est.)
Cost of response:	$1.0 billion USD
Trigger to 65% funded:	4 months

Drought measurement models

- **Industry-standard risk modeling firms measure expected loss (e.g. AIR, RMS)** – the issuer would contract one of these firms
- **Drought has been modeled** for insurance purchases in several countries, including in Ethiopia, Malawi, India
- **FEWSNET:** A USAID supported monitoring system that uses USGS and NOAA satellite data and other information to provide early warning for food security vulnerability (1 to 5 scale)
- **Water Resource Satisfaction Index (WRSI):** An algorithm that incorporates precipitation and several other natural phenomena to measure water shortfall
- **2011 East Africa Drought "1in 60 year drought"** – lowest rainfall since 1950; 30% of average 1995-2010 rainfall





Source: Humanitarian Information Unit, U.S. Departmentt of State; www.preventionweb.net

Pricing

- **Coupon** = Risk-Free Rate + Premium
- **Premium** = Average Annual Loss (Expected Loss) * Multiples (based on market risk appetite)
- **Multiple:** CAT bonds are priced as a multiple of the expected annual loss – this multiple can range from 2.5 to 3
  - Multiple tends to be lower for perils outside of the traditional US Wind and Earthquake bonds due the benefits of diversification
- **Annual Expected Loss:** Typical annual expected loss is 1% to 2%, but it can be higher
- **Example:** Mexico MultiCat 2009 – included a tranche with expected losses over 4% - priced at 12%

Fees

- **Lead Manager / Arranger / Adviser fees (paid at launch):** 80-200 bps; World Bank has offered more concessionary terms of range

- **Legal fees:** about 50 bps

- **Risk modeling fees:** 10-50 bps

- **SPV Administrator fee**, expenses associated with administration: 3-4 bps

- **Rating agencies fees**: 6-7 bps.

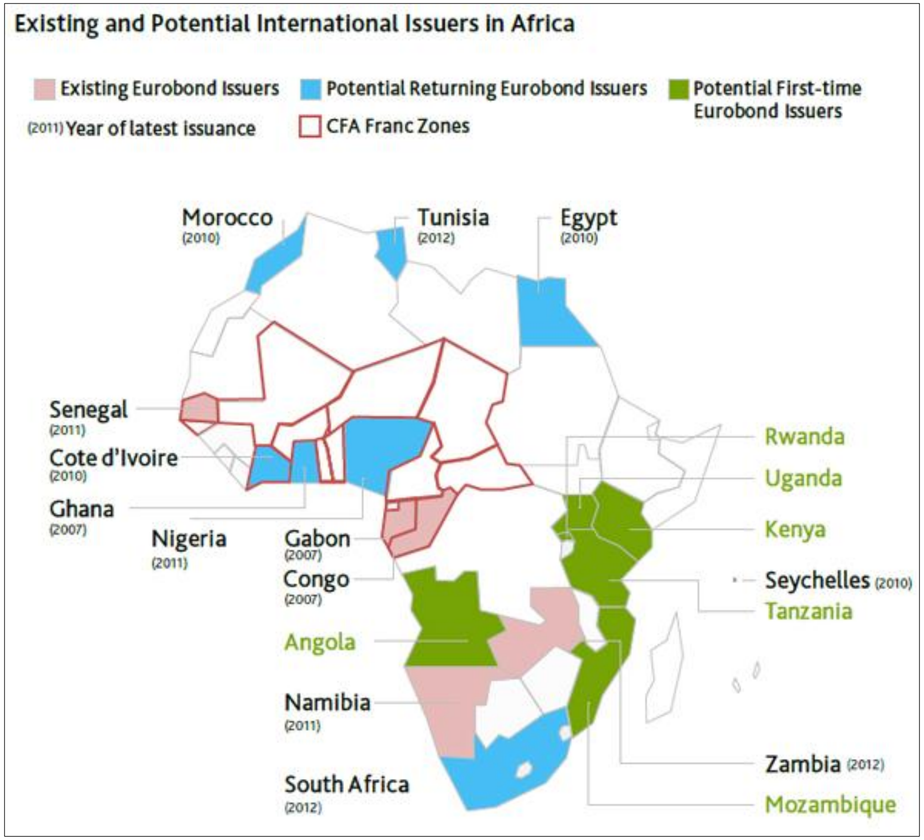
Source: http://opim.wharton.upenn.edu/risk/library/WP2011_EMK,IZ,VC,DT_CatFinancingforGovts.pdf

Arranging the Transaction

1. **Hire Arranger/Global Coordinator:** one that has experience in international capital markets (Mexico used the World Bank Treasury – this would be ideal) – would coordinate the efforts, assist in structuring, hiring of partner firms, and execution
2. **Partner Firms** to Be Hired by Global Coordinator:
   - A. **Investment Banks/Insurance Companies: T**o help structure and then sell the bonds (e.g. Goldman Sachs, Morgan Stanley, Swiss Re, Munich Re, etc.)
   - B. **Legal Firms:** Document the transaction, regulatory compliance
   - C. **Risk Modeling Firm:** Needed to model expected losses (e.g. AIR, RMS). Risk modeler will also be responsible for determining the triggering of the parameter.
3. **Determine Risks, Geographic Area, and Trigger**
   - A. **Risks:** Decide what to cover; modeling those risks
   - B. **Geographic Area:** Which regions?
   - C. **Trigger**: WRSI, Rainfall, or alternate measures? Multiple concurrent region or single region? Timing of trigger for payout?
4. **Structure the Bond**
   - A. **Size**
   - B. **Maturity**
   - C. **Payout structure**
   - D. **Tranches**
5. **Rating:** Get the ratings agencies to rate the bonds
6. **Establish SPV and Draft Legal Documents**
   - A. **SPV** established off-shore and managed by partner investment banks
   - B. **Legal documentation** uses standard CAT bond documentation; Produce Pricing supplement
7. **Road Show, Distribution, Issuance**
   - A. **Road Show and Distribute Information to Investors:** Work with partner banks and insurance companies to market to investors over several weeks. Road show should have representative from issuer, investment banks, global coordinator, risk modeler.
   - B. Investment banks sell to investors; determine final price.

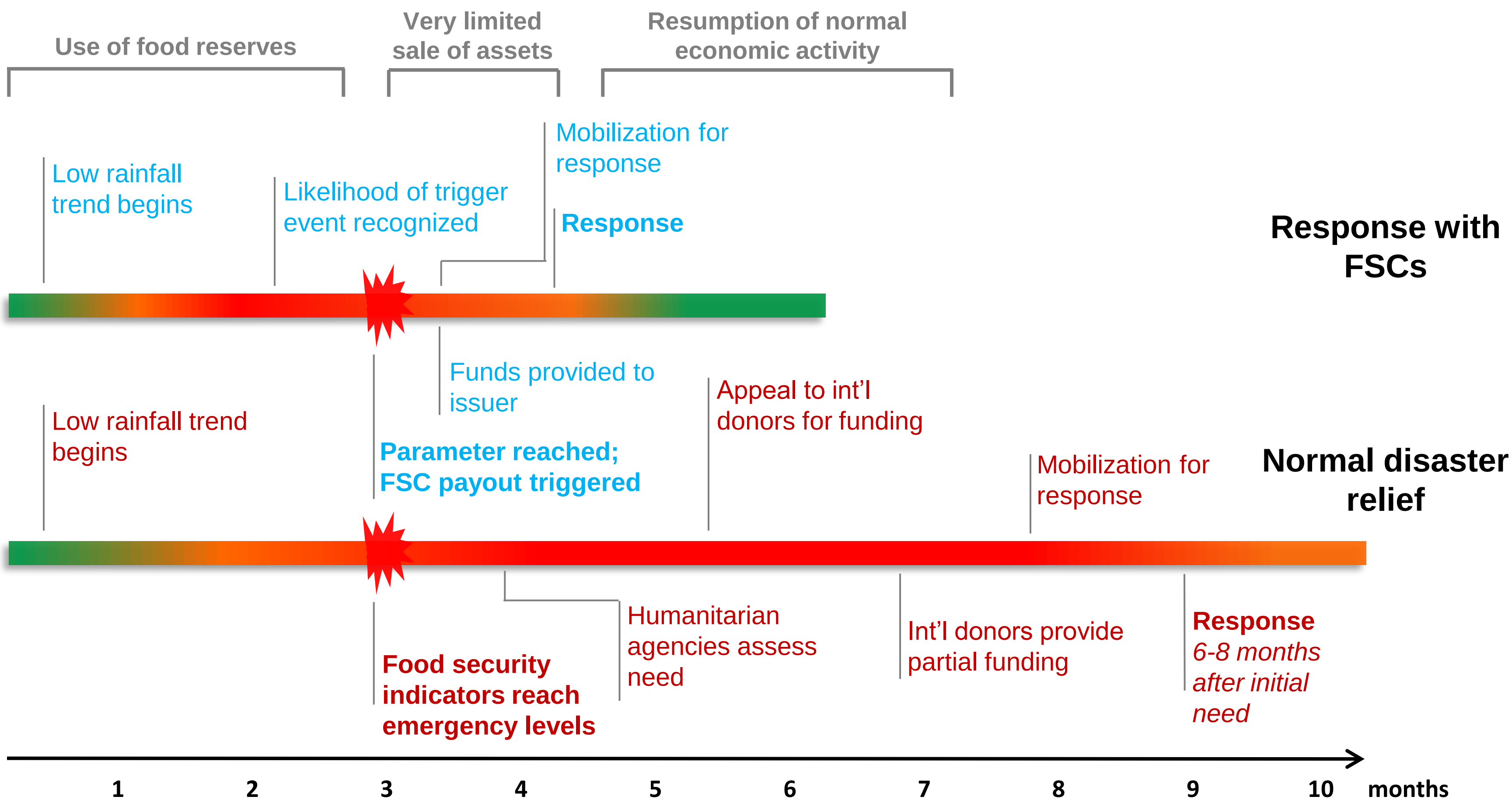
African Countries are becoming creditworthy

- **More African countries are issuing bonds**
- Trend: shift from **donor to market financing**
- **FSCs are not subject to default risk**
- Capital Economics: *“A growing appetite among foreign investors for African Debt.”*



Source: http://blogs.ft.com/beyond-brics/2012/10/15/africa-set-for-a-sovereign-debt-rush/

FSCs allow for speedy response; saving money, lives, and economic growth



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