The World Bank Treasury
New Financial Instruments

Regional Workshop
How can Governments better cope with Climate Risk in the Agricultural Sector
Querétaro, Mexico

Dolores Lopez-Larroy

Senior Financial Officer
Banking and Debt Management

The World Bank Treasury
1818 H Street, N.W.
Washington, DC, 20433, USA
treasury.worldbank.org

October 9th, 2008

Agenda

TREASURY
THE WORLD BANK

1 Introduction

2 Macro-Level Contingent Finance Products

3 Other Insurance Programs

Catastrophe risk in developing countries

- Natural catastrophes can have **substantial fiscal and developmental implications** for low and middle-income countries
- In the aftermath of a catastrophic event, **governments face a shortage of funds** as emergency funds are not always immediately available to the affected countries
- Insurance markets provide catastrophe insurance coverage only to a limited number of governments, and natural disaster **insurance premiums are high and volatile**
- As a result of market imperfections, governments of developing countries are often **deprived of natural disaster insurance**

Disaster Risk Management Financial Tools Available

	Tool	Cons
Ex-Post	Budget Reallocation	Interruption of ongoing projects, reduced economic activity
	Donations	Slow to mobilize, inefficient allocation
	Internal/External Borrowing	Slow to mobilize, more expensive as creditworthiness of the country decreases after disaster
	Tax Increase	Inflexible tax system and generally low tax ratios
	Money Supply Increase	Pressure on interest rate and currency value
	Use of FX Reserves	Possible balance of payment crisis,
Ex-Ante	Market Risk Management Products	Small size of the market: Expensive, volatile premiums Products often not customized to the needs of the client

The World Bank is now working with countries to develop ex-ante risk financing and reinsurance for natural disasters

Agenda

TREASURY
THE WORLD BANK

1. Introduction
2. Macro-Level Contingent Finance Products
3. Other Insurance Programs

World Bank Group's Macro-Level Contingent Finance Products

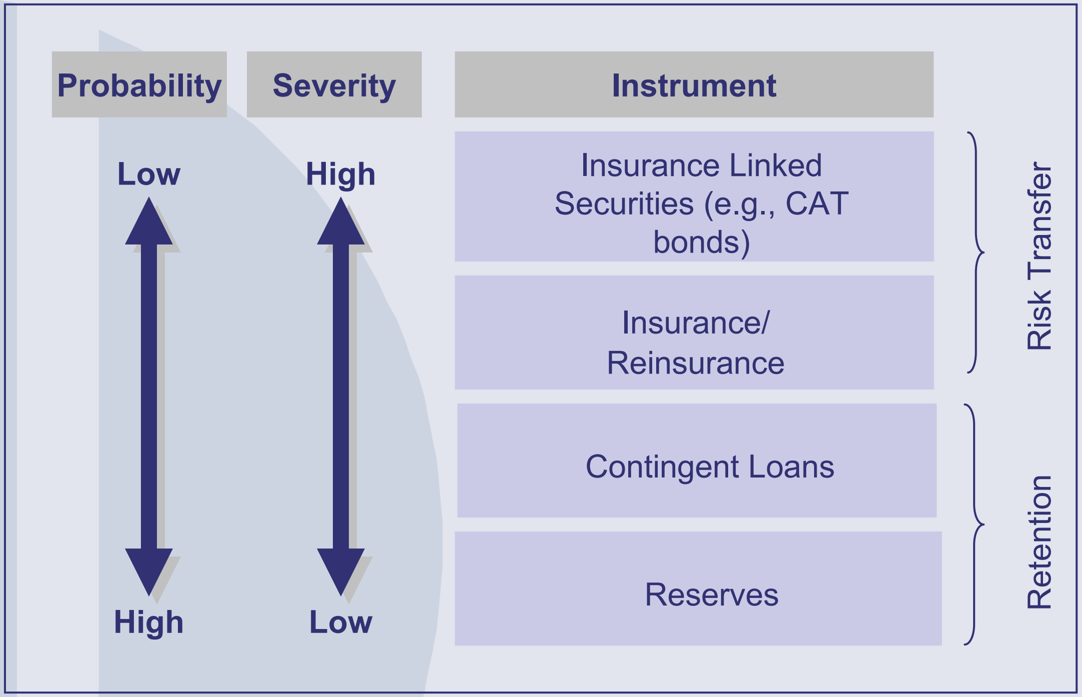
TREASURY
THE WORLD BANK

- World Bank Group products can address the immediate liquidity needs of clients and can help manage and transfer catastrophe risks to the market

Insurance-Linked Securities	➢ The World Bank Group is developing a **multi-country catastrophe bond** that would pool the risks of several countries and transfer it to capital markets. The World Bank is currently working on a first transaction with two governments. ➢ The World Bank Group assisted Mexico in issuing a **catastrophe bond** designed to transfer earthquake risk to investors. The government would not repay the bond principal in case of an earthquake of specified minimum intensity in the specified region.	Risk Transfer
Regional Insurance Pools	➢ The World Bank Group assisted sixteen Caribbean governments in establishing the **Caribbean Catastrophe Risk Insurance Facility** (CCRIF), a regional institution which offers parametric insurance against major hurricanes and earthquakes. The Bank arranged to place a portion of the catastrophe risk in the capital markets through a cat swap. A similar initiative is under preparation in the Pacific.	Risk Transfer
Deferred Drawdown Option Loans	➢ The **DPL DDO** and Catastrophic Risk or **CAT DDO** provide immediate liquidity upon the occurrence of a natural catastrophe. They offer bridge financing while other sources of funding are being mobilized.	Risk Retention

Catastrophe Risk Financing Framework

- There are several risk financing instruments most suited to specific types of risks
- Governments should determine the mix of risk financing instruments based on desired coverage, available budget and cost minimization



Source: Financial and Private Sector Development/ Financial Markets Networks (FPDSN), 2008

> **The World Bank Group assists borrowers in the design of their disaster risk management programs and works with them in defining a risk financing solution most adapted to their needs**

CAT DDO: applications and value-added

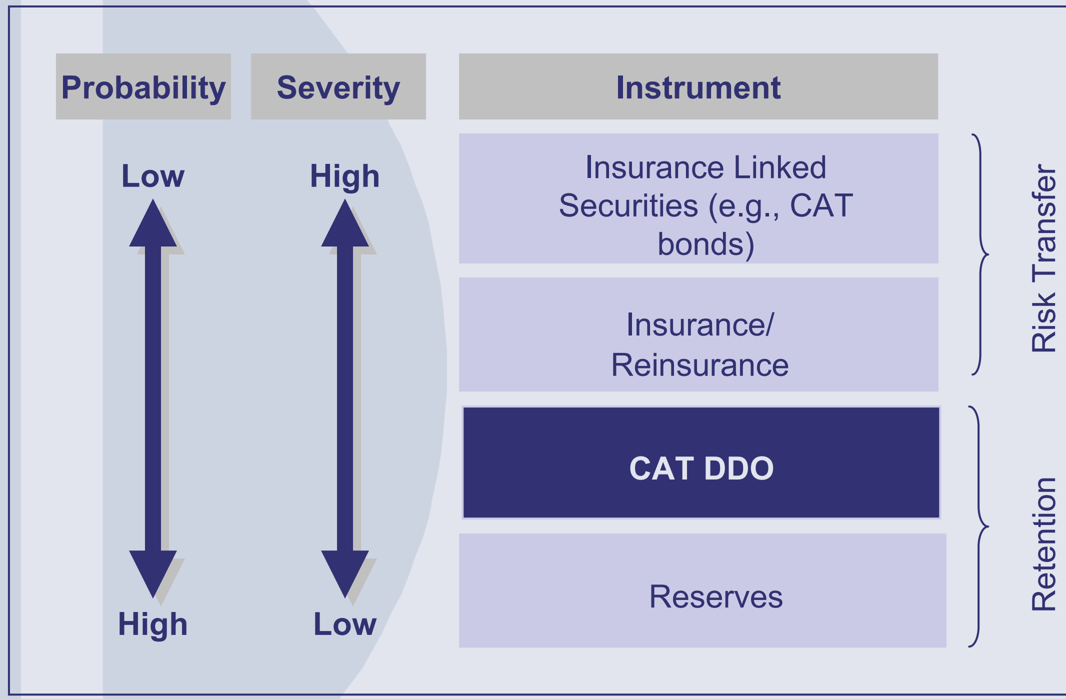
- The CAT DDO:

  - Offers a financial bridge between reserves and risk transfer instruments

  - Develops borrower's capacity to manage natural disaster risk

  - Offers a "soft trigger" (declaration of state of emergency)

  - Complements parametric tools



Source: Financial and Private Sector Development/ Financial Markets Networks (FPDSN), 2008

CAT DDO highlights

- **Provides a source of immediate liquidity** during an emergency, while others forms of assistance are being mobilized. Important when:
  - Credit conditions are tight and getting funds from other sources would be challenging
  - Other funds cannot be mobilized in a timely manner (e.g. donor contributions in the aftermath of a catastrophe)
- **Enhances the government's capacity** to implement a disaster risk management program
  - The World Bank reviews and reports on the country's implementation of the disaster risk management program
- **Helps manage basis risk**. Can cover losses not covered by insurance
- **Management of interest rate, currency and liquidity risk is possible**. The client can choose among the same risk management options offered for a loan
- **Competitive pricing**: Pricing is aligned to IBRD pricing. According to World Bank calculations, the CAT DDO is at least 25% less expensive than reinsurance for the "bottom layers"

CAT DDO: Terms and product structure

Drawdown/ Fund Availability	• Provides immediate liquidity after a natural disaster resulting in a declaration of state of emergency • Macro framework reviewed at commitment and at renewal • A disaster risk management program has to be implemented in accordance with Bank standards (client will be notified if non-compliant and funds will not be available for drawdown until back in compliance) • Full loan amount is available for three years, renewable up to four times with RVP approval, for a total maximum drawdown period of 15 years • Amounts repaid during the drawdown period will be available for subsequent drawdowns
Volume/ Optionality	• Maximum size of 0.25% of GDP or the equivalent of USD 500 million, whichever is smaller (exceptions possible for small countries on case-by-case basis) • The client can choose among the same conversion options (interest rate, currency) that are available for IBRD loans
Repayment Terms	• Repayment terms can be determined at the time of commitment or drawdown • Repayment schedule will commence from date of drawdown • Each drawdown may have different repayment schedules
Pricing	• Same as regular IBRD loans. • No fee will be charged for extension of the drawdown

CAT DDO Costa Rica Case Study

Background

- Costa Rica is exposed to floods, hurricanes, landslides, earthquakes and volcano activity.
- It ranks number two in the world among countries most exposed to multiple hazards, with 78% of its population residing in areas with high risk of adverse natural events.
- Costa Rica benefits from a strong emergency management framework that allows the country to face small-to-medium sized events with financing from its ongoing budget and existing reserves.
- However, Costa Rica needed an instant source of budget financing to complement its other resources available, in order to reduce its fiscal vulnerability to natural disasters and avoid budget reallocations that could affect other ongoing development programs directed at poverty reduction and alleviation.

CAT DDO Costa Rica Case Study

TREASURY
THE WORLD BANK

Financial Risks

- Liquidity Risk

Financial Solution

- **Catastrophe Risk Deferred Drawdown Option** (CAT DDO) for USD 65 million (0.25% of Costa Rica's 2007 GDP):
  - funds may be disbursed (partially or in full) upon occurrence of a natural disaster.
  - flexibility for changing the amortization schedule for each new disbursement, in order to obtain more suitable repayment terms as needed to finance the expenses generated by the disaster.

Outcomes

- CAT DDO will provide a source of **bridge financing** while other sources are being mobilized following a natural disaster.
- This operation will **support** two **key policy areas of the Costa Rica Disaster Risk Management Program**: (i) strengthening the legal and institutional framework; and (ii) mainstreaming disaster risk prevention in the National Development and Investment Programs.

DPL DDO: Terms and product structure

TREASURY
THE WORLD BANK

Drawdown/ Fund Availability

- Provides immediate liquidity when the borrower needs it
- Adequate macroeconomic policy framework must be in place (client will be notified if non-compliant)
- Satisfactory program implementation will also be monitored by the bank
- Full loan amount is available any time within three years, renewable with RVP approval

Volume/ Optionality

- Volume limit equivalent to indicative Fast-Disbursing CAS Envelope
- The client can choose among the same conversion options (interest rate, currency) that are available for IBRD loans

Repayment Terms

- Repayment terms can be determined at the time of commitment or drawdown
- Repayment schedule will commence from date of drawdown
- Each drawdown may have different repayment schedules

Pricing

- Same as regular IBRD loans
- No fee will be charged for extension of the drawdown

DPL DDO and CAT DDO: main differences

	DPL DDO	CAT DDO
Scope	• Broad. Can be withdrawn at the client's request	• Specific. Can be withdrawn if a natural disaster occurs
Eligibility	• Macroeconomic policy framework adherence • Satisfactory program implementation	• Macroeconomic policy framework adherence at the time of commitment and renewal • Preparation or existence of a disaster risk management program
Monitoring	• Continuous macroeconomic policy framework adherence monitored at least every 12 months • Continuous program implementation monitored at least every 12 months	• Macroeconomic policy framework adherence not monitored • Continuous disaster risk management program adherence monitored at least every 12 months
Volume	• Volume limit equal to indicative fast disbursing CAS envelope • Renewable once, for 6 years maximum • Counted against CAS	• Limit of 0.25% of GDP or the equivalent of USD 500 million, whichever is smaller (exceptions possible for small countries) • Renewable 4 times, for 15 years maximum • Counted against CAS *at drawdown* • Prepaid amounts may be withdrawn again

Risk Transfer through CAT Bonds

Catastrophe-linked securities are risk financing instruments that allow buying insurance through the capital markets by raising funds from investors

Catastrophe Bonds (or CAT bonds)	• most common type of catastrophe-linked-securities • targeted to a wide investor base: money managers, hedge funds, pension funds, insurers and re-insurers

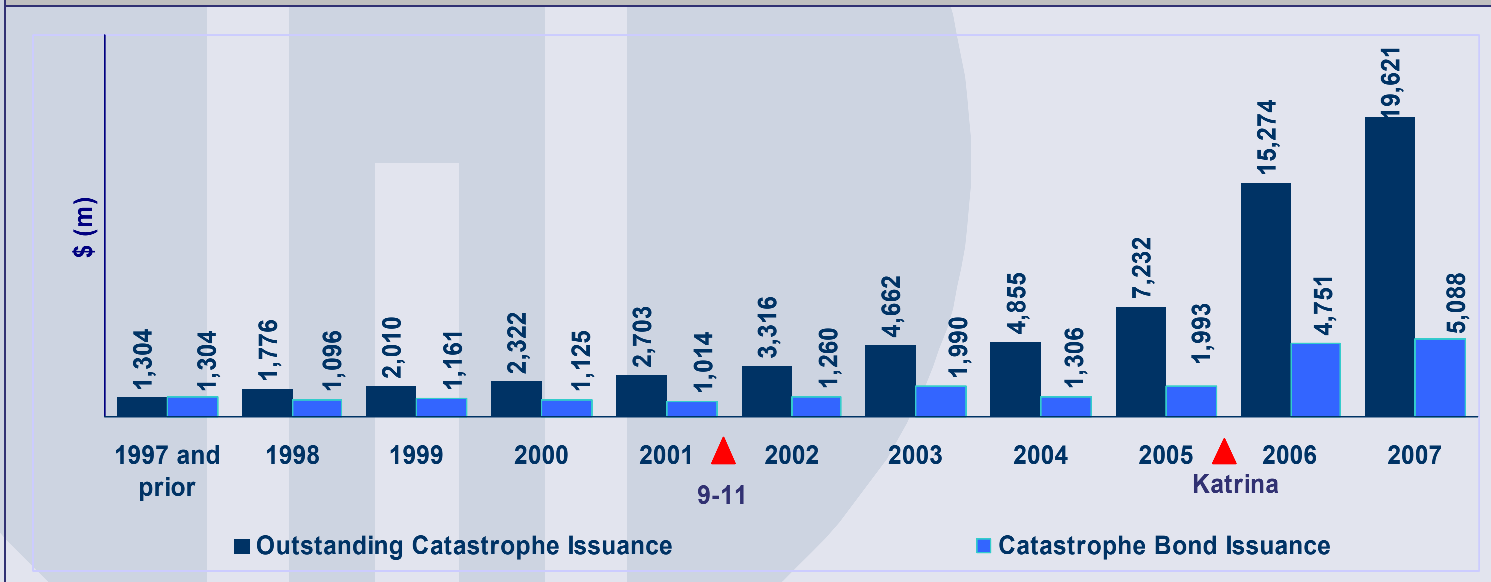
Insurance payouts are collateralized; hence the insured faces no credit risk.

The market for CAT bonds is growing

- The CAT bond market is 10 years old
- Capital markets have capacity to absorb natural disaster risks
- New investors continue to enter in catastrophe insurance markets in search of attractive yields and diversification

Market Growth

Catastrophe bond market 1997-2007

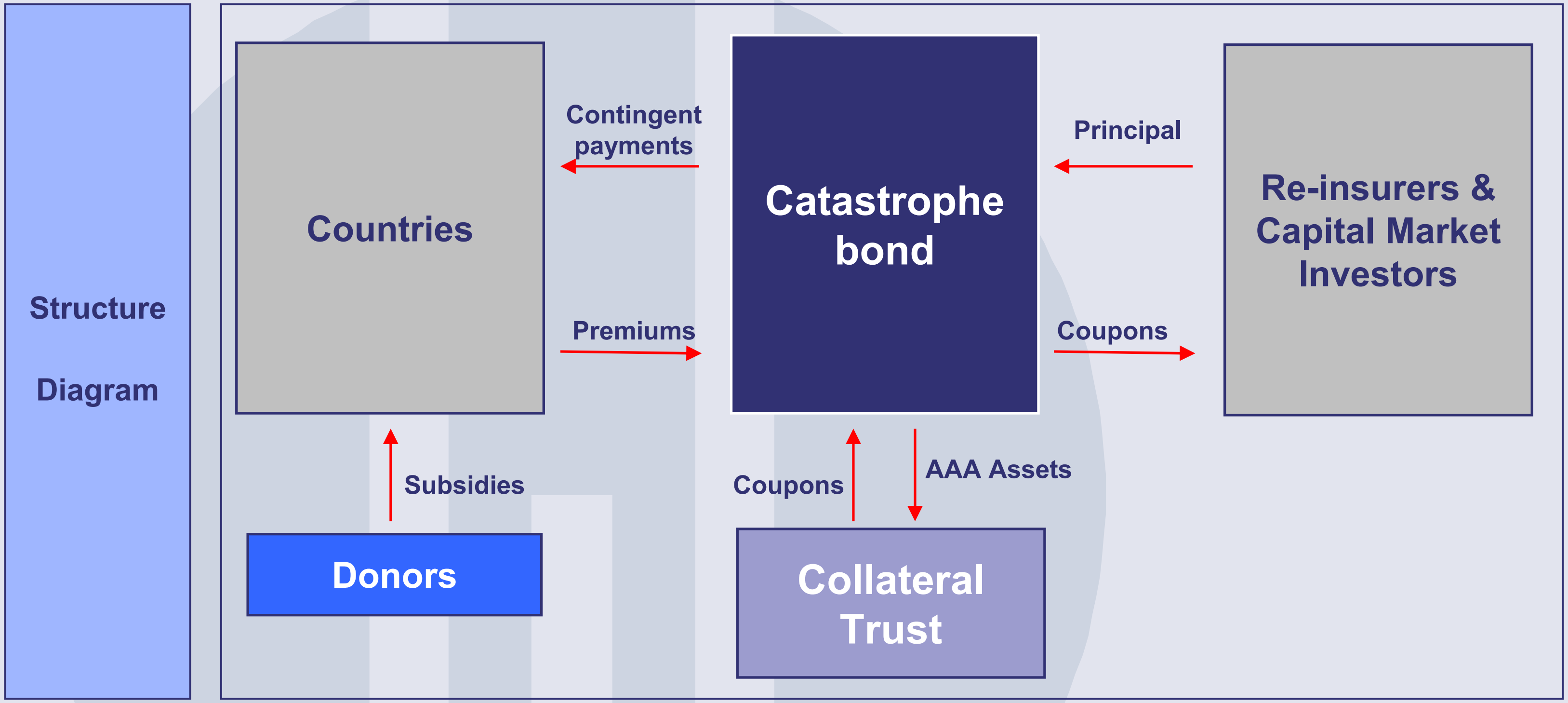


Multi-Country Catastrophe Bond (MCCB)

The multi-country multi-peril CAT bond is structured to:

- Allow member countries to pool risks across different perils, such as hurricanes and earthquakes, reducing the cost of insurance via diversification.
- Transfer non-peak risks to the capital markets efficiently.
- Provide multi-year coverage at fixed rates, resulting in lower premium volatility and less "renewal" risk
- Enable rapid access to funds after the event, based on specific coverage triggers (parametric insurance)
- Eliminate any incremental debt as funds do not need to be repaid

Structure of the CAT Bond



Caribbean Catastrophe Risk Insurance Facility (CCRIF)

- Caribbean countries have a high exposure to a variety of adverse natural events
- Limited economic resilience to disasters because of:
  - small size
  - limited borrowing capacity
- Dependence on financing from international donors to finance post-disaster needs
- Limited access to insurance and reinsurance markets, and limited resources to do so

Caribbean Catastrophe Risk Insurance Facility (CCRIF)

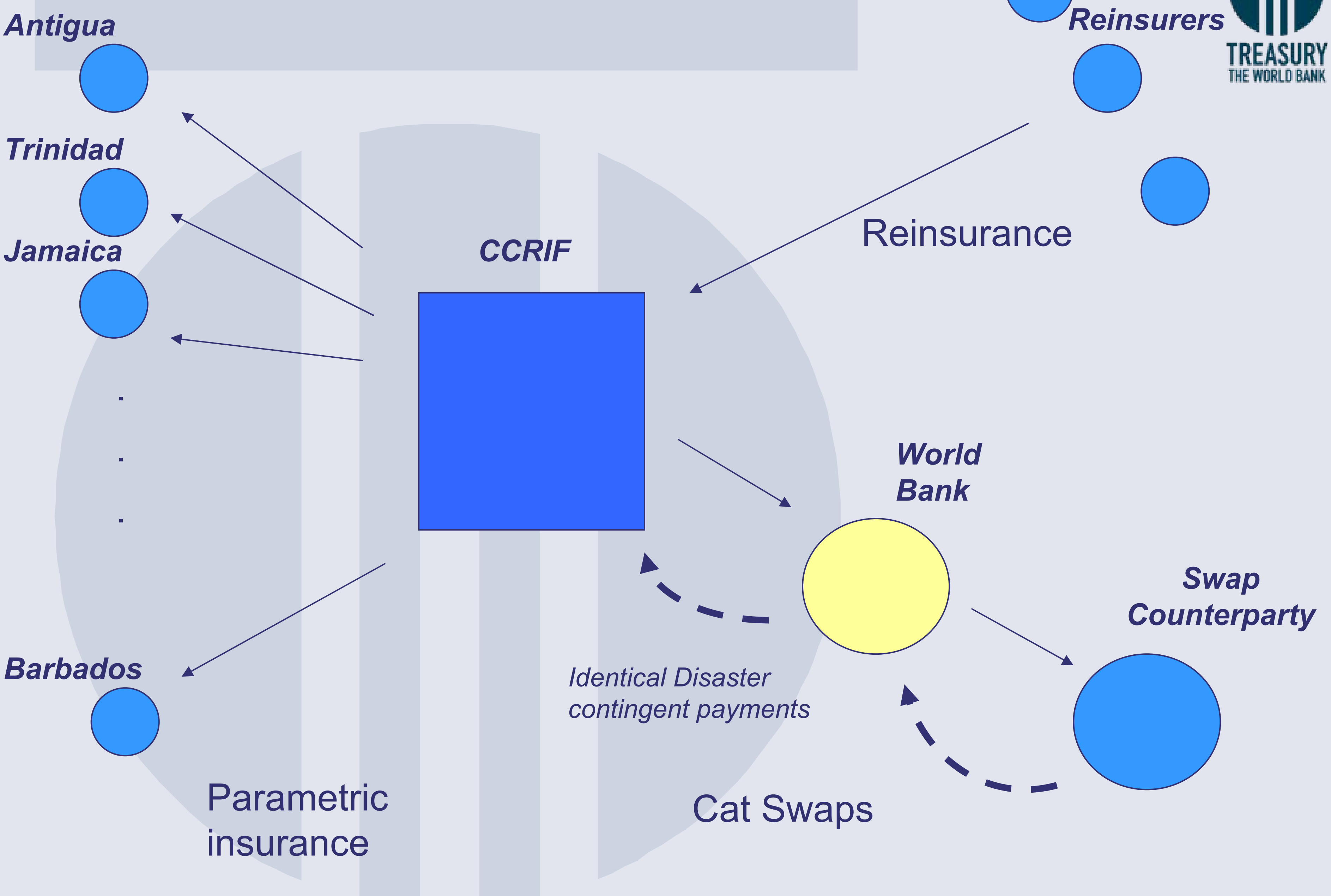
- 16 Caribbean countries established the CCRIF
- Its primary objective is to provide immediate liquidity to the affected country if hit by a hurricane or earthquake
- Participating countries pool their country-specific risks into a diversified portfolio to reduce premiums
- Countries decide the level of coverage they wish to purchase, and pay an annual premium accordingly
- Donors contribute to a reserve fund to support the Facility, reducing the cost of insurance premiums
- The Facility transfers the risks it cannot retain through reinsurance or other coverage instruments (CAT swap)

Caribbean Catastrophe Risk Insurance Facility (CCRIF)

Parametric policy

- Insurance is provided to countries on a parametric basis: rapid, simple and transparent assessment of policy payout amount.
- Payout is based on a measured parameter of the hazard event (such as wind speed for hurricanes) rather than on actual scale of loss.
- Information characterizing an event is provided by NHC (for hurricanes) and USGS for earthquakes.
- Using this published information, a specified formula is used to calculate the parametric index value for each country for the event.

Caribbean Catastrophe Risk Insurance Facility



Agenda

1 Introduction

2 Macro-Level Contingent Finance Products

3 Other Insurance Programs

Other Insurance Programs

- The World Bank Group offers a range of complementary products and services to assist countries develop tailor-made catastrophe risk financing strategies.

Property Catastrophe Insurance Programs	➢ The World Bank Group assisted Turkey in establishing the **Turkish Catastrophe Insurance Pool** (TCIP), that offers efficiently priced earthquake insurance to homeowners.
Agriculture Insurance Programs	➢ The World Bank Group has provided technical assistance for the development of innovative agriculture insurance programs in several low and middle-income countries. ➢ The **Index-Based Livestock Insurance Program** was established by the Government of Mongolia to protect herders against excessive livestock mortality. ➢ The Government of India, with the assistance from the World Bank, established a **Weather Based Crop Insurance Scheme** to protect farmers against drought.
Specialist Index Reinsurer	➢ The World Bank Group is supporting the creation of the **Global Index Reinsurance Facility (GIRIF),** a multi-donor trust fund linked with a specialized index-based reinsurance company, which will promote index-based insurance in developing markets.
Weather Derivatives	➢ The World Bank Group offers weather derivatives to provide risk management products to member countries, transferring the weather risk to the market.

Exposure to Weather Risk

- Low and middle-income countries bear weather risks that can have a large impact on their GDP and their budget:
  - Direct economic loss (e.g. damage to stock of housing)
  - Production shocks (e.g. damage to agricultural production)
- Hedging products can help manage weather risks in the context of a wider risk management framework.

Weather Market Gap and World Bank's Role

TREASURY
THE WORLD BANK

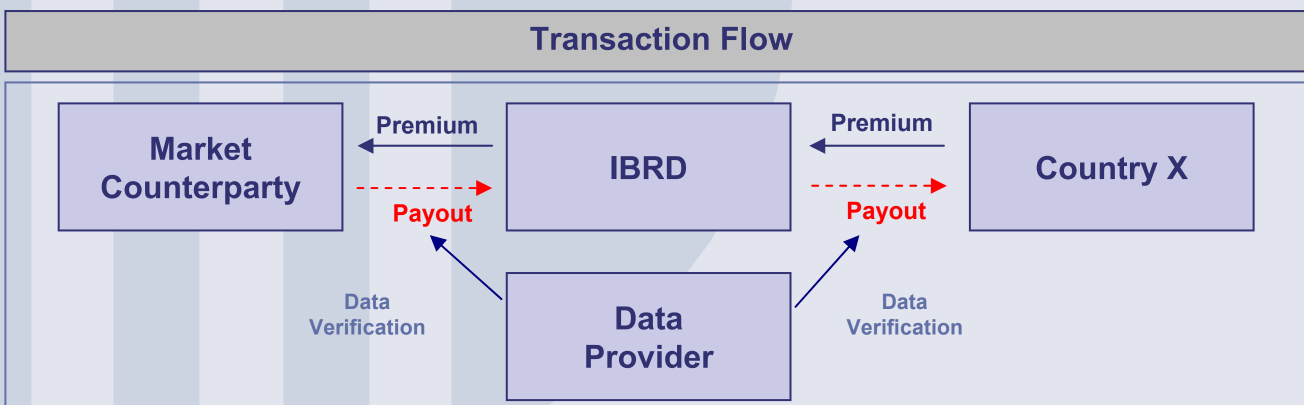
Market Concentration	▪ The majority of weather derivative transactions tend to be for developed markets - the US in particular
High Investment	▪ Derivative transactions **capacity building** ▪ High cost of initial **due diligence**
Moral Hazard	▪ Concerns about **possible manipulation** of weather data

- **The WB can intermediate index-based weather derivatives for its clients (droughts, floods, high temperature).**
- **These mechanisms should be considered as one of a menu of instruments that could be used to implement a disaster risk management strategy**

Indexed-based Weather Derivatives offered by the WB

- The client enters into a derivative agreement with the WB. In exchange for a premium, they get coverage against weather risk.
- The WB will pay out if a predetermined index, which is a proxy for weather-related losses, hits a trigger.
- A market counterparty will “compensate” the World Bank if the same index hits the trigger.
- With index-based products, no measurement of the actual loss is required.
- Risk has to be measurable and “indexable”. Weather data is provided by the national meteorological services, and verified by an independent third party.

Same structure as other WBG risk management instruments



Case study: Malawi

The Problem	▪ Recurrent droughts affecting the production and the price of maize ▪ Government imposes inefficient price caps on the commodity, creating a market distortion
The Solution	▪ World Bank assisted the government to identify when weather risk management instruments can be appropriately used ▪ Malawi would enter into a derivative and receive a payout in case of severe drought in the country ▪ The potential payout could be used to cap the price of maize imports ▪ The government would stabilize the price of maize without causing market distortions

Hedging Weather Risk: The case of Malawi

- The World Bank can now offer index-based weather derivatives to allow countries to transfer weather risk to the financial markets
- Malawi enters into an index-based derivative agreement with the WB. In exchange for a premium, it will obtain coverage against the risk of droughts
- The client country will receive a payout from the WB if the index hits a pre-determined trigger. It is selected by the country, based on coverage and cost considerations

- ✓ **Weather derivatives can be used to hedge against the multiple negative effects of weather events**
- ✓ **Applications include hedges on agricultural production, energy production (hydro or wind power) and tourism revenues**

Commodity Derivatives

- The World Bank intermediates commodity derivatives, subject to the availability of a swap market.
- The World Bank undertakes a due dilligence to ensure that the client has made an informed and independent decision on the use of the product.
- Clients are required to provide a rationale for their choice of products linked to their risk management strategy.
- The World Bank would pass through to the client the terms of the swap it obtained in the market, leveraging its AAA rating, plus an administrative fee.

Commodity derivatives

Exporters

- Declining commodity prices negatively affect tax revenues
- Futures or forward contracts can be used to stabilize stream of income to the government
- Put options can be used if the government wants to participate in future upward movements of commodity prices, while being protected from downside risks

Importers

- Rising commodity prices increase government expenditure from subsidies used to regulate domestic price levels
- Futures or forward contracts can be used to stabilize expected expenditure levels
- Call options can be used if the government wants to benefit from falling commodity prices, but still be protected from increasing price levels

Summary

- The frequency and severity of natural disasters has been on the rise, and sovereigns have become more proactive in designing a disaster risk management framework.
- The World Bank Group has traditionally been involved in post-disaster reconstruction lending. However, in recent years, it has worked with member countries to develop ex-ante risk financing and reinsurance for natural disasters.
- The added value provided by the World Bank Group stems from its expertise in disaster risk management, its access to the market, its ability to work with countries in different regions to pool risks together and its experience in providing customized financial solutions to its members.