



DEMYSTIFYING CATASTROPHE BONDS FOR DEBT MANAGERS



THE WORLD BANK

Treasury | IBRD • IDA

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May 2018

CAT BONDS

- ❑ Basics & Structure; Benefits & Limitations
- ❑ Market Dynamics
- ❑ Benefits of using World Bank as an Issuer & Execution Process
- ❑ Value Proposition for Sovereigns
- ❑ Role of World Bank as an Advisor & Intermediary for Member Countries

Basics & Structure

Benefits, & Limitations

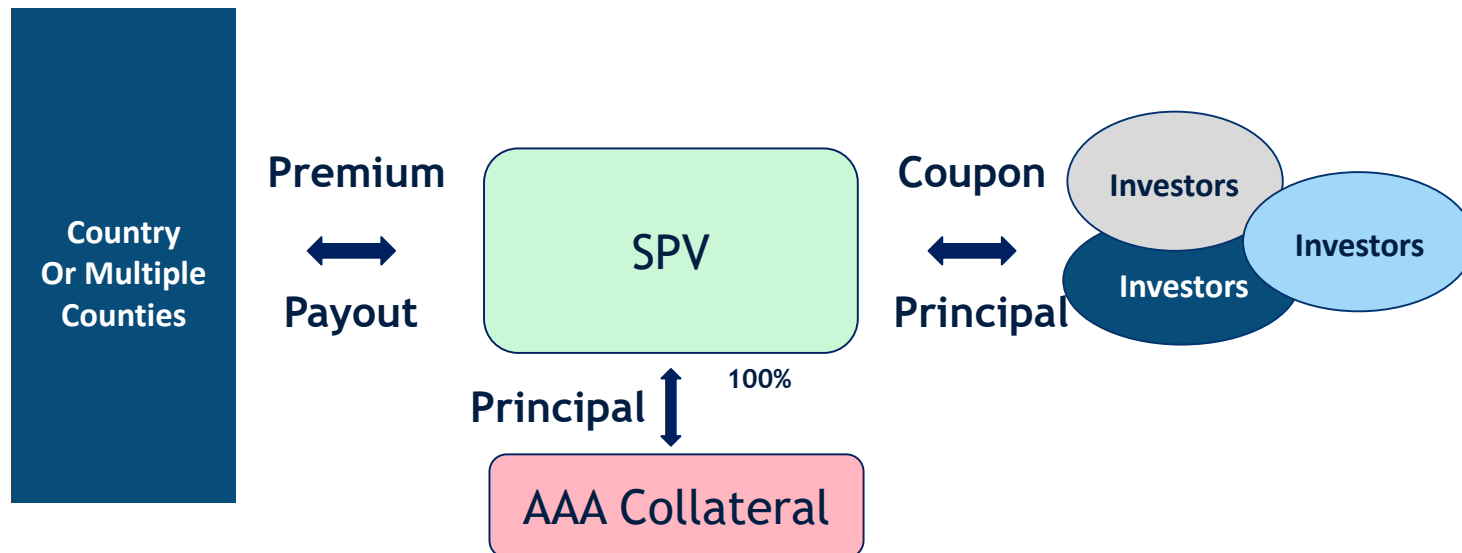
CAT BONDS IN GENERAL

Cat bonds enable sponsors to transfer catastrophe risk to capital market investors through a special purpose vehicle (SPV). Provides protection equivalent to an insurance policy.

Proceeds from the sale of the bond are invested in liquid and safe collateral.

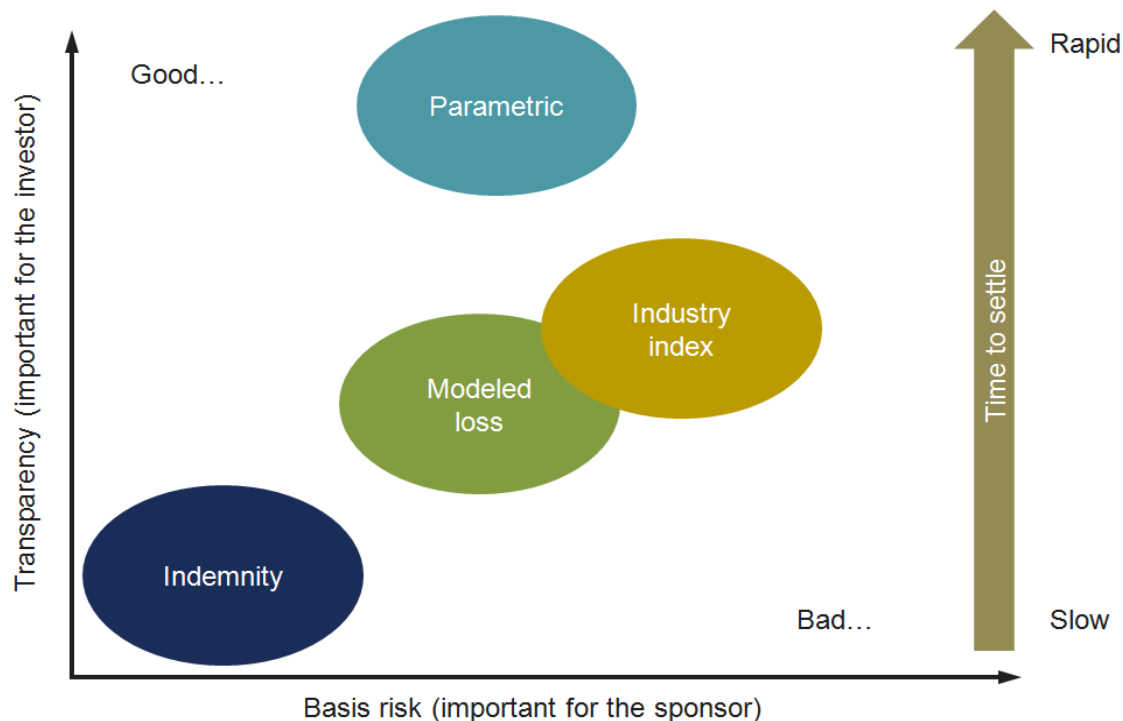
Returns from the collateral, combined with the premium paid by the sponsor enable the bond to pay higher than market risk-adjusted returns to investors.

If no disaster trigger events occur, the investors get the enhanced coupon and receive the principal back at maturity. If events occur, some or all of the principal is transferred to the sponsor, with no repayment obligation.



CAT BONDS: COMPARISON OF TRIGGER TYPES

Trade-offs between transparency, response time, and basis risk



Source: Risk Management Solutions

CAT BOND PRICING – COUPONS AND MULTIPLES

- Coupons (or premiums) on cat bonds are priced at multiples over expected losses.
- The lower the multiple, the better the value for the insured.
- Using the graph, the expected loss of an event is 2.41 percent
 - The Premium (and coupon of the bond) is 4.95 percent
 - The insurance multiple is 2.05, or $4.95/2.41$



CAT BONDS: BENEFITS & LIMITATIONS

Benefits:

- ▶ **Risk Coverage:** Multi-year coverage (longer than typical reinsurance contracts), with ability to lock in premiums
- ▶ **Pricing & Liquidity:** Syndication to large number of global investors allows for efficient price discovery; tradable instruments with observable, secondary market pricing
- ▶ **Investor Base:** Appeals to a large and growing pool on investors seeking uncorrelated assets and diversification
- ▶ **Credit Risk:** Fully funded transactions, with no risk of missed or late payments
- ▶ **Premium Levels:** Comparable to conventional (re)insurance (except for very low or very high expected loss transactions)

Limitations:

- ▶ Complex structuring requirements to set up SPV, Collateral Accounts
- ▶ More parties and agreements involved, Due diligence is required prior to issuance
- ▶ No reinstatement of coverage

Market Dynamics

CAT BONDS: MARKET REVIEW

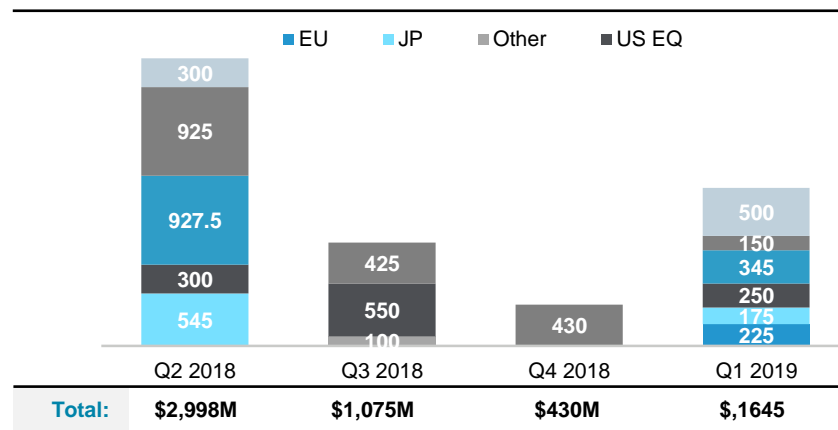
As of April 30, 2018

Property Cat Bond Metrics

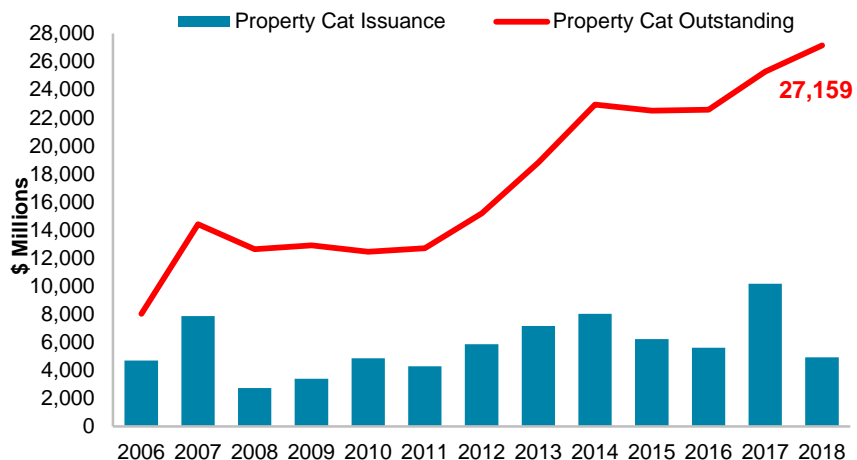
2018			
Completed Issuances	Sponsors	Issuance Volume	Average Deal Size
13	16	\$4.91B	\$377M

2017			
Completed Issuances	Sponsors	Issuance Volume	Average Deal Size
33	29	\$10.2B	\$307.9M

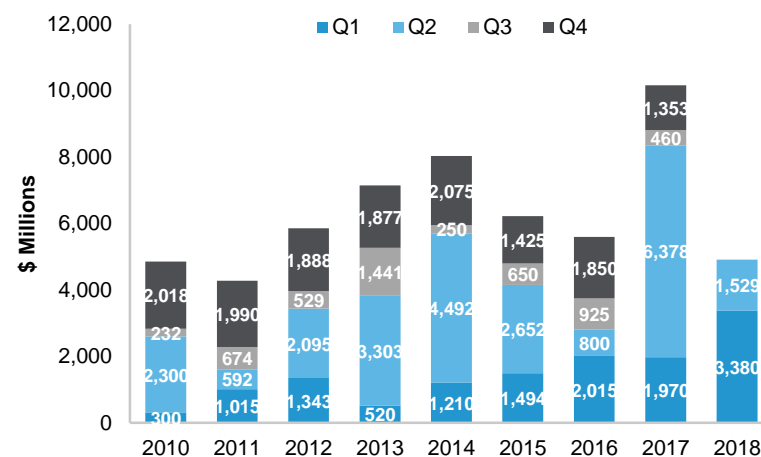
Property Cat Bond Maturities by Quarter



Property Cat Bond Issuance and Outstanding by Year



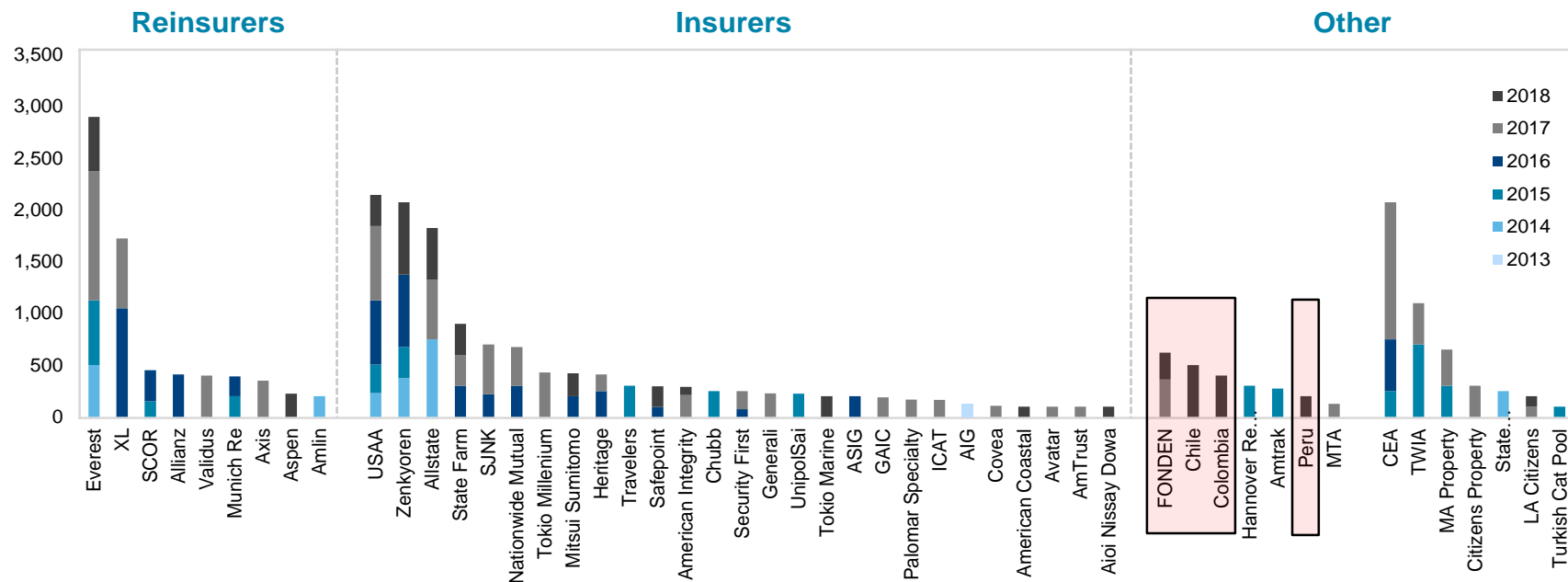
Property Cat Bond Issuance by Quarter



Kilimanjaro 2018-1 & 2, Integrity 2018-1 and Residential 2018-1 have priced but not issued and are included in the figures above

Source: Aon Securities Inc.

OUTSTANDING PROPERTY CAT BONDS BY SPONSOR



Q1 2018 is a record
quarter for ILS
Issuance

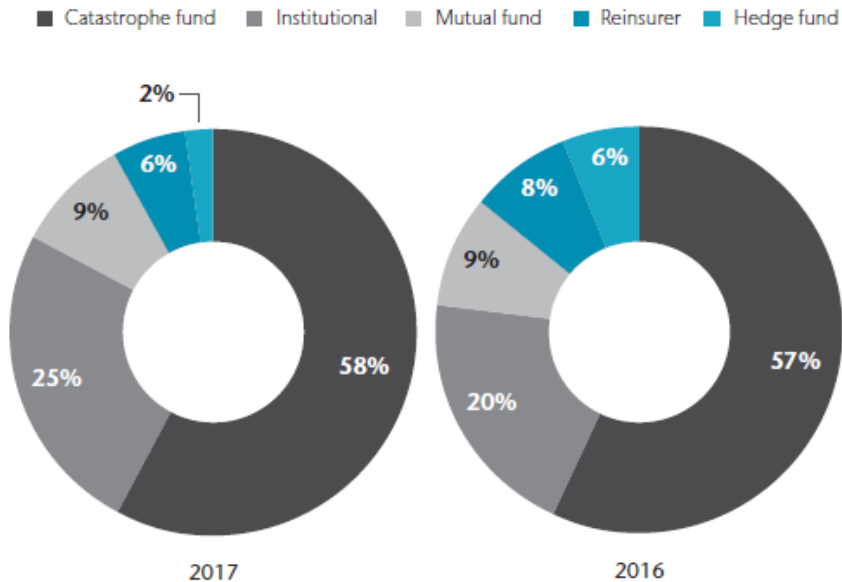
- In total, over \$3.3 billion of bonds were issued during Q1 of 2018, a new high-water mark for first quarter issuance tallies, and far exceeds the 2016 and 2017 first quarter issuance volumes with each at approximately \$2 billion

Kilimanjaro 2018-1 & 2, Integrity 2018-1 and Residential 2018-1 have priced but not issued and are included in the figures above

Source: Aon Securities Inc.

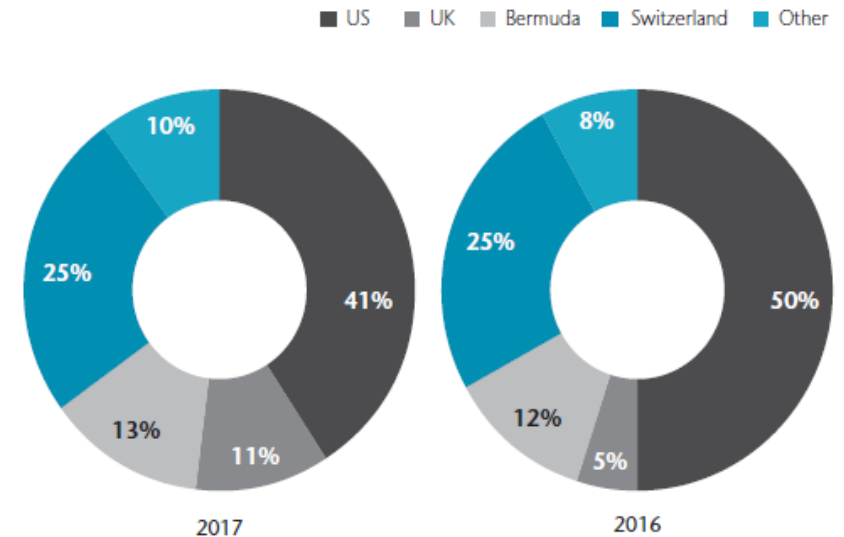
CAT BONDS: INVESTOR DISTRIBUTION

Investors by category



Source: Aon Securities Inc.

Investors by geography

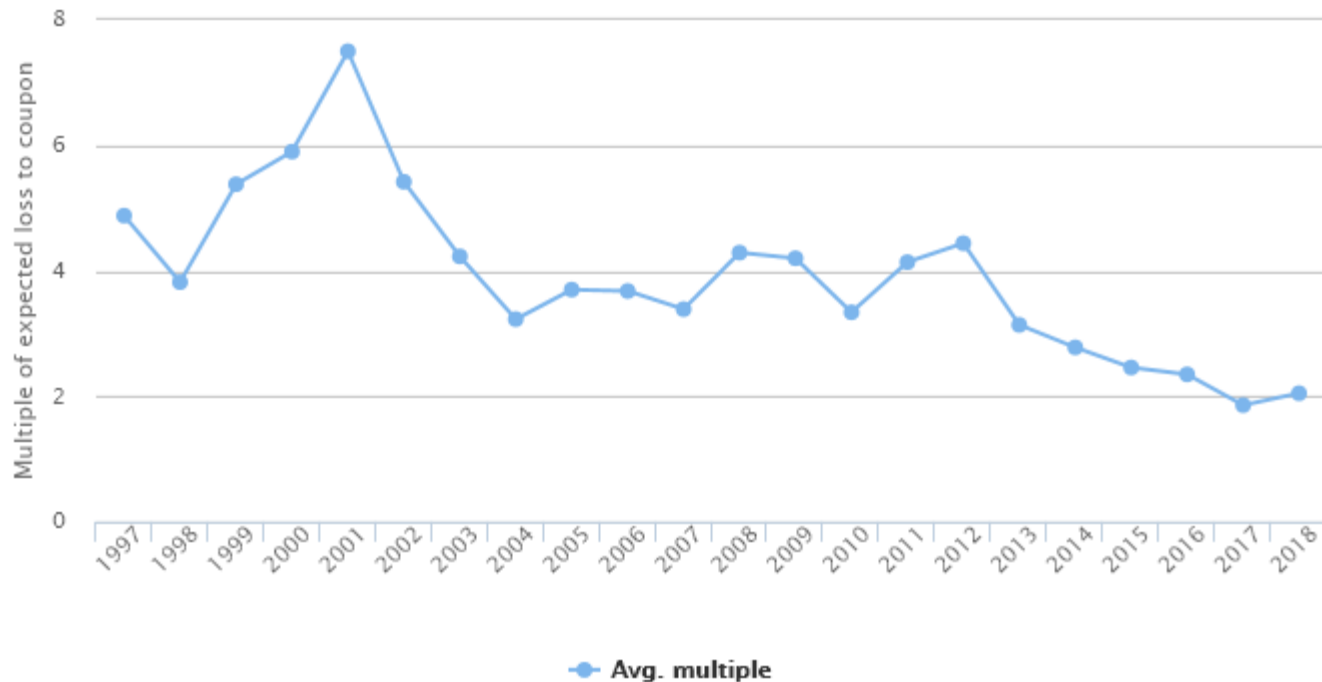


Source: Aon Securities Inc.

CAT BONDS: PRICING TRENDS

Prices are dropping given that more and more investors are accessing the market

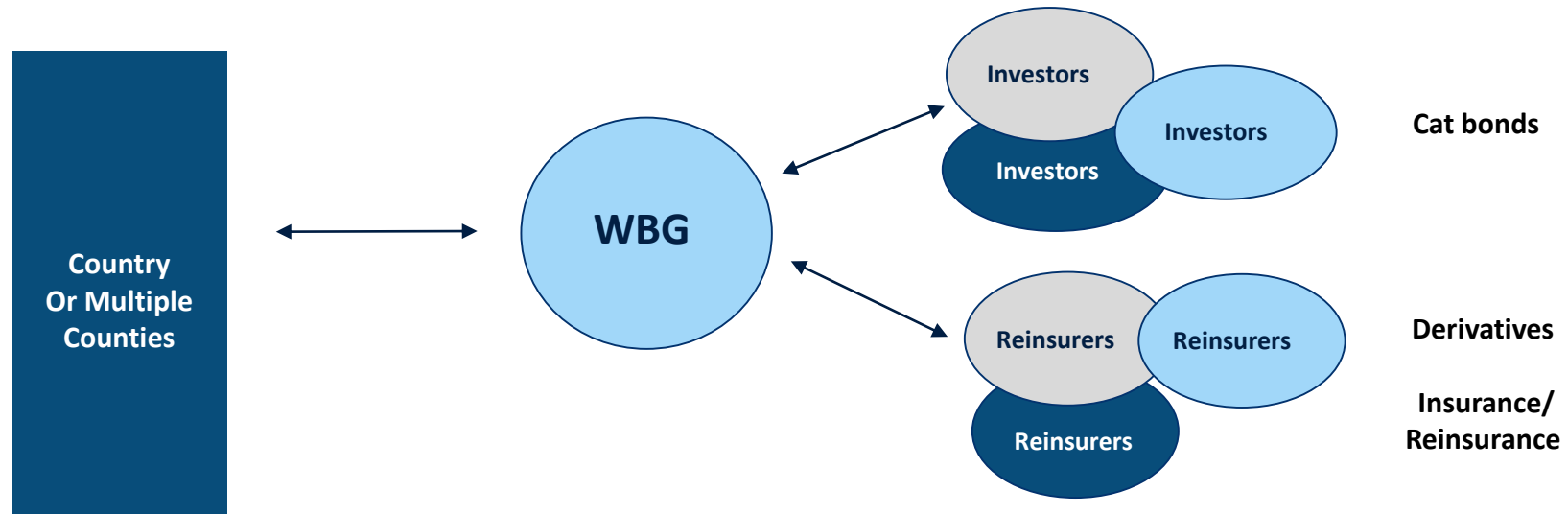
Average Multiples



Source: www.Artemis.bm Deal Directory

Benefits of using WB as an Issuer & Execution Process

WB'S RISK TRANSFER INTERMEDIATION PLATFORM



World Bank can function as an intermediary to transfer risk from a country or group of countries and the international financial markets.

- Highly adaptable to the particular needs of the client (type of risk, documentation, coverage terms, legal and budgetary requirements, etc.).
- Responsive to market conditions and able to reach wide range of investors to get competitive pricing
- Can cover the risks of central governments, national companies and sub-national entities
- Offers enhanced counterparty credit risk protection
- Reduces legal, modeling, brokerage and issuance costs

BENEFITS OF IBRD CAPITAL-AT-RISK PROGRAM

- ▶ **Eliminates the time and expense of setting up and managing a SPV**
- ▶ **Alleviates potential concerns of using a SPV structure which are typically set up in offshore jurisdictions**
- ▶ **Eliminates the cost of setting up a collateral trust (IBRD is triple-A rated, alleviating the need to hold segregated collateral)**
- ▶ **Streamlines the process and cost of appointing agents for modelling, escrow, etc.**
- ▶ **Makes the Cat bond issuance process more stream-lined and cost-efficient because of the IBRD's existing tax and securities law exemptions in the US, the EU and elsewhere.**
- ▶ **The proceeds of the issue are used for developmental purpose, making the bonds a socially responsible investment (SRI) for the investors**
- ▶ **World Bank is a leading provider of natural disaster risk insurance and is an established issuer in the Cat bond market with a high level of name recognition among ILS investors (over \$2 billion of Cat bonds issued to date)**

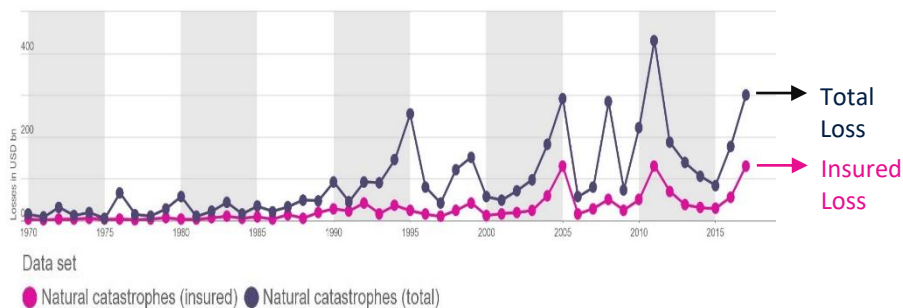
CAT BONDS: EXECUTION PROCESS WITH WORLD BANK

- ▶ Engage underwriters and transaction counsel
- ▶ Engage modeling firm, design trigger structure and prepare modeling documentation
- ▶ Prepare prospectus, marketing materials, calculation agency agreement and post event loss calculation procedures
- ▶ Marketing, investor calls, and “roadshow” (if required)
- ▶ Book-building Process
- ▶ Bond is priced
- ▶ Risk coverage starts (roughly 3-6 months from start date)

Value Proposition for Sovereigns

CAT BONDS: VALUE PROPOSITION FOR SOVEREIGNS

- Global economic losses from disasters now over \$300 billion per year, and disasters create implicit contingent liabilities.
- Cat bonds provide a hedge against these liabilities by transferring risks to capital markets.
- Because they are issued through an SPV or intermediary, Cat bonds do not count as debt stock of the sponsoring sovereign.
- Factored by rating agencies in overall assessment of sovereign credit risk.
- Can be linked to objective/parametric triggers that generate quick payouts for disaster response.

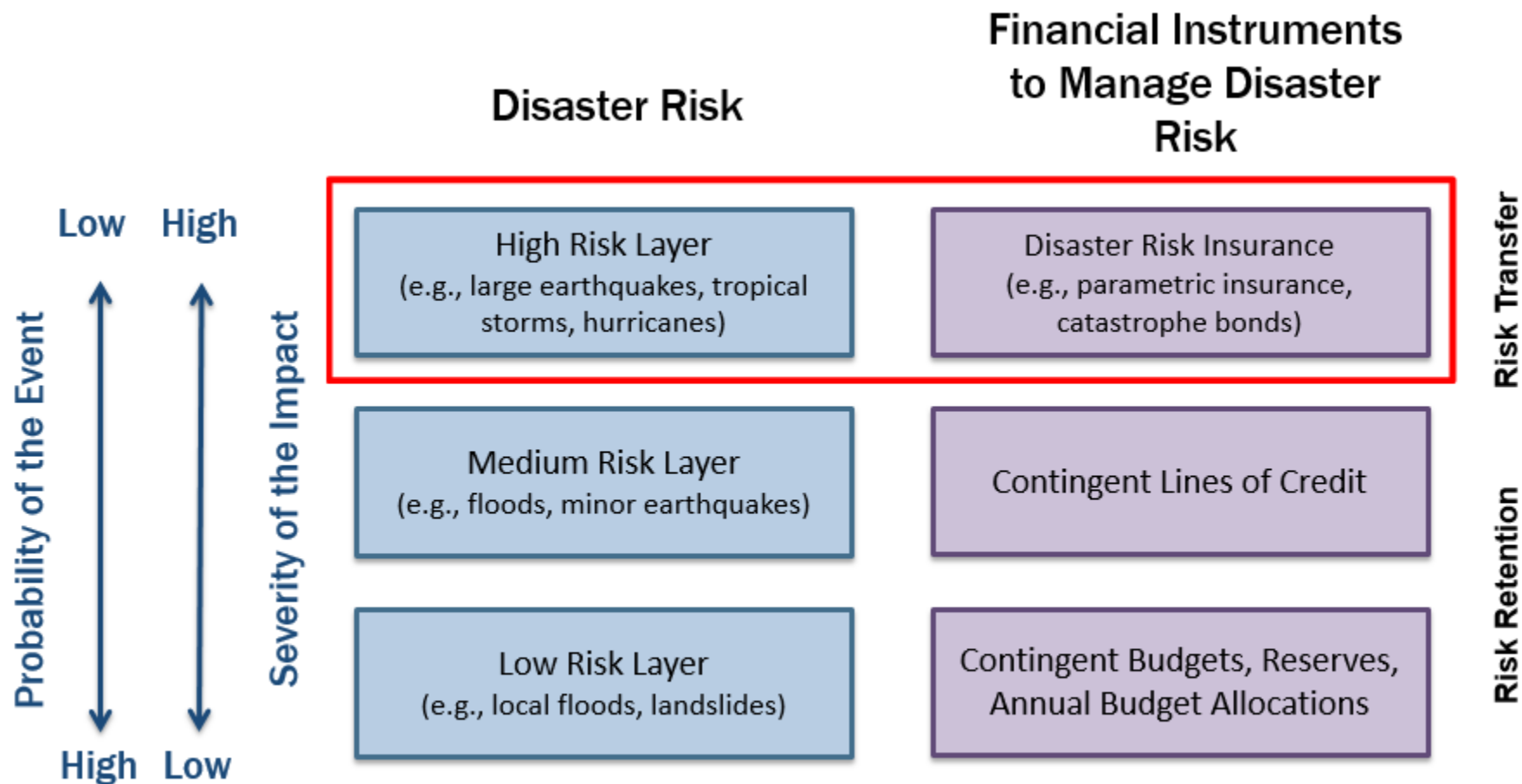


Source: sigma world insurance database
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Examples of Perils / Risks to Manage

Wind (hurricanes and tropical cyclones)
Earthquakes
Tsunamis
Flood
Drought
Pandemic

CAT BONDS: IDEAL FOR COVERING LOW FREQUENCY, HIGH SEVERITY EVENTS



Role of the WB as an Advisor & Intermediary for Member Countries

WB HELPS COUNTRIES ESTABLISH A DISASTER RISK FINANCING PROGRAM

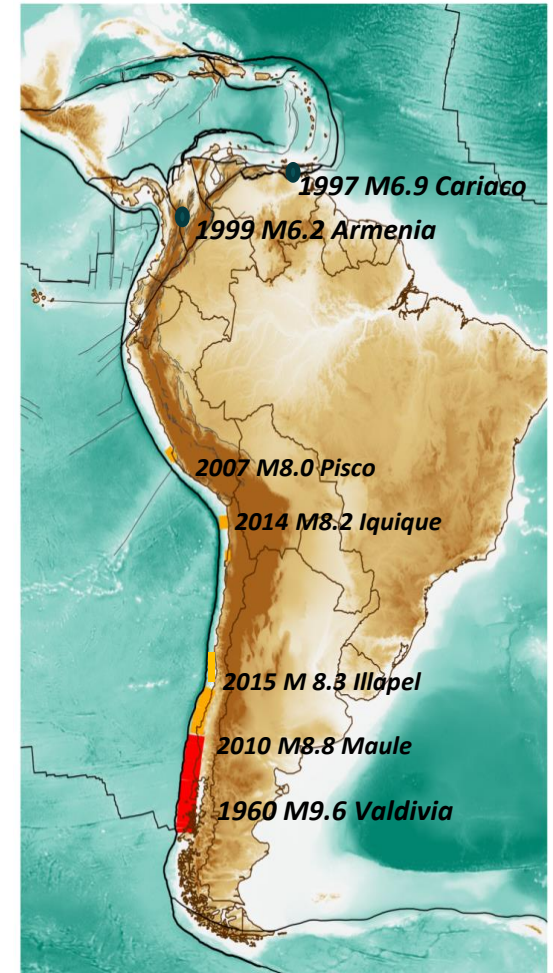
1. **Quantify risk exposure** – what are the contingent liabilities related to disaster and climate hazards?
2. **Design a comprehensive risk financing strategy** – what instruments are currently available? Where are the gaps that can be covered with a combination of products to finance retention and transfer of risk?
3. **Evaluate options for risk transfer** – which instrument is most cost effective for the specific perils? What option and legal documentation aligns with country's financing needs and regulatory environment? What is the target budget?
4. **Design and execute capital market transaction for risk transfer** – which trigger and coverage parameters best fit the needs?

Pacific Alliance Countries Joint Cat Bond

The countries of the Pacific Alliance – Colombia, Chile, Mexico and Peru – worked together to implement an innovative solution that benefits all countries.

Technical Support

- WB provide advisory services , supported by the Swiss Government, in the year proceeding execution focused on bring Chile, Colombia and Peru quickly up to speed as they were considering risk transfer for the first time.
- Improve general understanding of Insurance Linked Securities (ILS) market and instruments
- Explain risk transfer options relative to limitations/preference of each country from legal, regulatory perspective
- Supervise catastrophe risk modeling to develop risk profiles and example risk transfer structures
- Customize legal documentation for risk transfer



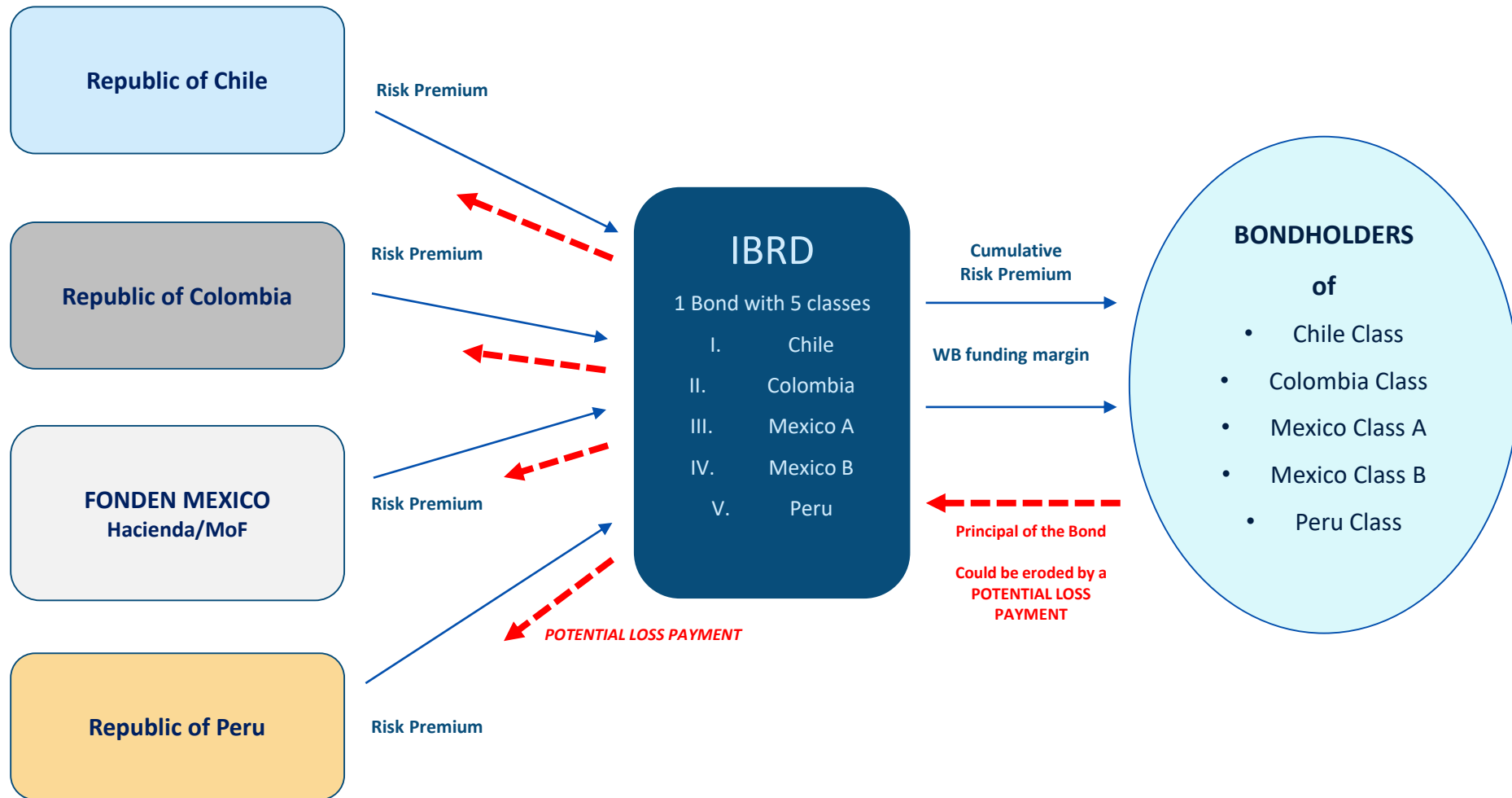
Pacific Alliance Countries Cat Bonds

Financial Solution

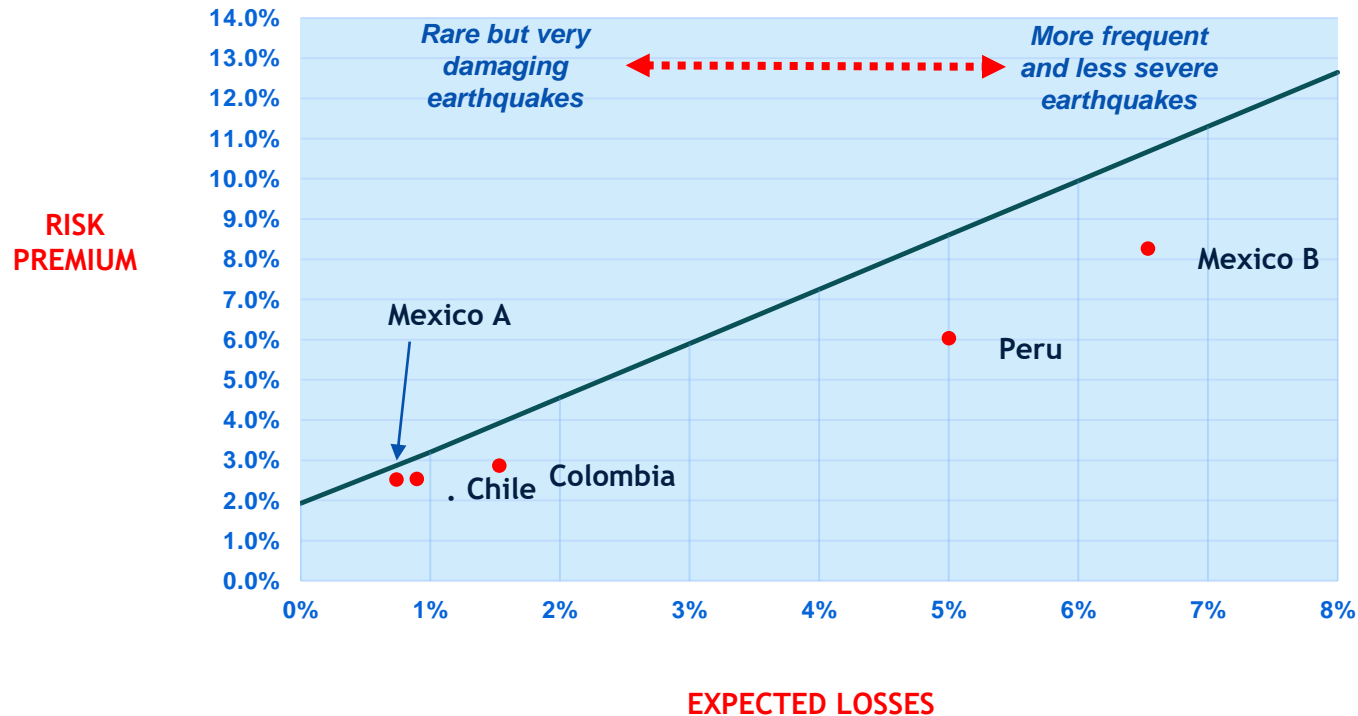
- \$1.36 billion (2nd largest cat bond ever issued)
- Provides coverage to Pacific Alliance members Chile, Colombia, Mexico and Peru.
- 1st and largest simultaneous issuance for 4 countries.
- Simultaneous issuance has advantages:
 - Diversification for investors; and
 - Economies of scale and pricing advantages for issuers

Transaction Summary	
Nominal amount:	USD1,360,000,000 (with USD2,500,000,000 in orders)
Classes:	Chile – USD 500 million Colombia – USD 400 million Mexico (a) – USD 160 million Mexico (b) – USD 100 million Peru – USD 200 million
Tenor:	3 years for Chile Colombia and Peru, 2 years for Mexico
Risk Premium:	Chile – 2.5 percent Colombia – 3.00 percent Mexico (a) – 2.50 percent Mexico (b) – 8.25 percent Peru – 6.00 percent

Pacific Alliance Countries Joint Cat Bond



Pacific Alliance Countries Joint Cat Bond



	Expected Loss	Risk Premium	Multiples
Chile	0.86	2.5	2.91
Colombia	1.56	3.00	1.92
Mexico Class A	0.79	2.50	3.16
Mexico Class B	6.54	8.25	1.26
Peru	5.00	6.00	1.20

Pacific Alliance Countries Joint Cat Bond

Summary Points

- A cat bond can be a critical component of a risk financing strategy
- Key value proposition is to strengthen fiscal resilience which can improve discussions with creditors and rating agencies
- Not “one size fits all” – expertise is needed to match the country’s need with the instrument
- Getting the best deal – Growing appetite from investors is lowering premium costs, and multi country issuance can increase diversification benefits and share costs

Annex: Case Studies

Pandemic Emergency Financing Facility

IBRD Issues first-ever pandemic bonds covering all 77 IDA countries; early activation mechanism helps contain pandemics and exponential costs associated with outbreaks.

- Following the Ebola crisis in 2014, the G7, World Bank and WHO committed to develop a more robust global pandemic risk management framework. The Pandemic Emergency Financing Facility (PEF), a parametric based insurance program, is designed to disburse funding swiftly -- to governments, multilateral-agencies and non-governmental organizations in eligible IDA countries -- to support coordinated containment efforts to stop outbreaks of many of the most dangerous diseases.
- In June 2017, the first was executed transaction for PEF. This was the first time World Bank bonds and swaps were used to finance efforts against infectious diseases, and the first time pandemic risk in low-income countries was transferred to the financial markets.
- Risk was offered to the market in public bond and derivative form. This dual format issuance was an innovation to appeal to the broadest possible pool of risk takers. More than 30 separate investors including asset managers, pension funds, insurance companies and specialist catastrophe risk funds participated.
- The transaction raised \$425 million through Class A Notes (\$225 million bonds and \$50 million derivatives covering Flu and Coronavirus) and Class B Notes (\$95 million bonds and \$55 million swaps covering Filovirus, Coronavirus, Lassa Fever, Rift Valley Fever and Crimean Congo Hemorrhagic Fever.



Local Governments in the Philippines Cat Swap

Development Challenge

- Philippines is among the most vulnerable to natural disasters.
- US\$3.5 billion in asset losses assessed annually from typhoons and earthquakes.

Financial Solution

- World Bank worked with the local government on a new catastrophe risk insurance program to help the country better respond to losses from climate and disaster risks
- Philippine peso equivalent of **US\$206 million in cat swap coverage in an emerging market local currency** provided against losses from major typhoons and earthquakes.
- **25 provinces** participate in program.
- **1st:** reinsurance agreement with a **government agency** cat risk transaction in **local currency**.
 - **PHP 83.5m (US\$eq. 1.6m) payout** triggered by Typhoon **Vinta** in December 2017.



Caribbean Catastrophe Risk Insurance Facility

Development Challenge

- Insurance pools allow countries to obtain group insurance against risks at lower rates than they would pay for individual coverage.
- Like the other products, these policies rapidly put financial resources in the hands of public officials in the aftermath of climate disasters.

Financial Solution

- In June 2014, the Bank issued its first catastrophe bond under its newly established Capital-at-Risk Notes Program to help the [Caribbean Catastrophe Risk Insurance Facility \(CCRIF\)](#) transfer the natural disaster risk of 16 member countries to the capital markets
- CCRIF leveraged on the World Bank's experience, with the World Bank Treasury guiding the outreach and investor discussions.
- This financial solution allowed CCRIF to secure multi-year access to insurance at a fixed price, thereby achieving greater stability for its risk transfer program.

Transaction Summary	
Nominal amount:	USD 30,000,000
Issuer	IBRD
Risks Covered	Caribbean tropical cyclone and earthquake
Issue Date	June 30, 2014
Maturity Date	June 7, 2017
Trigger Type	Parametric modeled loss (KAC model)
Risk Margin	6.50%
Listing	Luxembourg

Pacific Islands

Development Challenge

- Small economies highly exposed to natural disaster: Cook Islands, Marshall Islands, Tonga, Solomon Islands, Samoa, Vanuatu.
- Lack of **expertise and/or scale** to hedge these risks.
- **Pooling** provides diversification and **better cost of insurance**.

Financial Solution

- **Pacific Catastrophe Risk Assessment and Financing Initiative** pools risk to provide rapid payouts linked to impact of an earthquake, tropical cyclone or tsunami.
 - \$232.5 million in swaps provided **coverage** at competitive rates from the international reinsurance market.
 - US\$1.3 million payout to Tonga triggered by Tropical Cyclone Ian in January 2014.
 - US\$1.9 million payout to Vanuatu triggered by Tropical Cyclone Pam in March 2015.



Uruguay

Development Challenge

- Uruguay's energy matrix is dominated by hydropower.
- 2008 drought and record high oil prices cost government more than \$400M in increased energy production costs.
- In 2012, UTE (national energy company) had to borrow from market and withdrew \$150M from Uruguay's Energy Stabilization Fund, ultimately increasing consumer utility rates.

Financial Solution

Contingent loan and weather derivative for energy sector

- Combined Financing of \$650 million through:
 - **US\$ 200 million contingent financing option** that provides funding when adverse weather shocks happen and there are insufficient resources to draw upon in the Energy Stabilization Fund (reserve fund created in 2010).
 - **US\$ 450 million customized weather derivative** provides coverage against combined risk of drought and high oil prices.

Transaction Summary	
Type of Contract	Hydropower energy index-linked weather derivative
Maximum Payout	USD 450,000,000 (cumulative)
Term	18 months from Jan 1, 2014 to June 30, 2015
Weather Index	Uruguay Potential Hydropower Energy Index ("UPHEI")
Strike	Specified units of the UPHEI index
Settlement Dates	Semi-annual (for a total of 3 semesters)

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