

# World Bank Catastrophe Bonds Provide Mexico with \$595 million Financial Protection against Hurricanes and Earthquakes

Between April and May 2024, the World Bank issued 4 catastrophe (cat) bonds that provide the Government of Mexico with \$295 million financial protection against earthquakes and \$300 million against named storms.

## Background

Mexico's geography, marked by several tectonic faults and long hurricane prone coastlines, makes it highly susceptible to earthquakes and hurricanes. The Government actively mitigates and manages disaster risks and has been a pioneer in the use of cat bonds to manage extreme natural disaster risks, sponsoring its first cat bond in 2006. Since then, Mexico has sponsored 20 different cat bond issuances, all of which saw participation of the World Bank either as advisor or issuer.

The last cat bond transaction, executed in March 2020, provided Mexico with \$485 million financial protection against earthquake and hurricane events over a four-year period. In October 2023, a category 5 hurricane, named Otis, hit Mexico's west coast, causing human tragedy along with significant financial losses. Mexico's relief and recovery was supported by a \$60 million payout from that cat bond.

## Project Objectives

Mexico sought to renew and expand the cat bond coverage for another four years. Mexico aimed to optimize the structure to close its coverage gap while minimizing basis risk. Lastly, Mexico looked for quicker payouts for hurricane events.



*Acapulco after Hurricane Otis, 2023. Photo Credit: Al Jazeera/Felix Marquez*

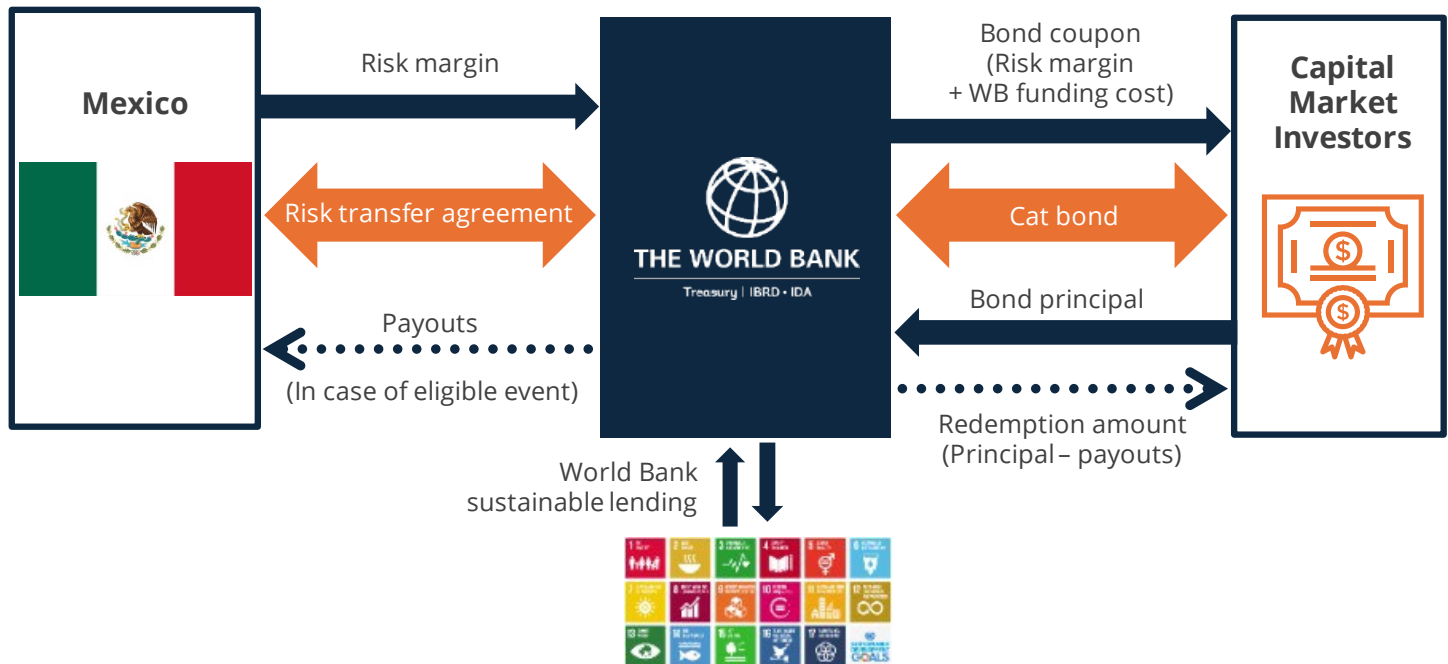
## Financial Solution

The four new cat bonds expand the financial protection by \$110 million to \$595 million for four years until April 2028:

- Class A: \$225M low-risk earthquake coverage
- Class B: \$70M high-risk earthquake coverage
- Class C: \$125M Atlantic hurricane coverage
- Class D: \$175M Pacific hurricanes coverage

The transaction involves a set of risk transfer agreement that pass the risk from the Government of Mexico to the World Bank. The World Bank transfers the risk to cat bond investors through the four cat bonds (see chart on the next page). Mexico pays a premium for the coverage, which the World Bank transfers to the cat bond investors as part of the bond coupon. The World Bank will provide payouts to Mexico based on the physical parameters of an event: hurricane central pressure, the magnitude and depth of an earthquake, and the location of the event.

## Transaction structure<sup>1</sup>



Mexico optimized the parametric structure for the four bonds with the support of a modeling firm, structuring agents, and the World Bank. The structure was optimized to fill the gap between Mexico’s risk exposures and its other risk financing instruments. Structural changes included:

- The earthquake cat-in-a-grid structure was refined with a depth condition, smaller boxes, and a smoother transition between adjacent boxes (see Class A parametric structure chart on the next page).
- The hurricane cat-in-a-gate structure was updated to include refined parameters based on Mexico’s objectives (see Class C parametric structure chart on the next page).
- To allow for quicker payouts following hurricane events, payouts are now determined based on earlier reports from the

National Hurricane Center referred to as the B-deck data. The B-deck data available two weeks after the final public advisory for the hurricane are used, in contrast to the tropical cycle reports that are often only available months after the hurricane season.

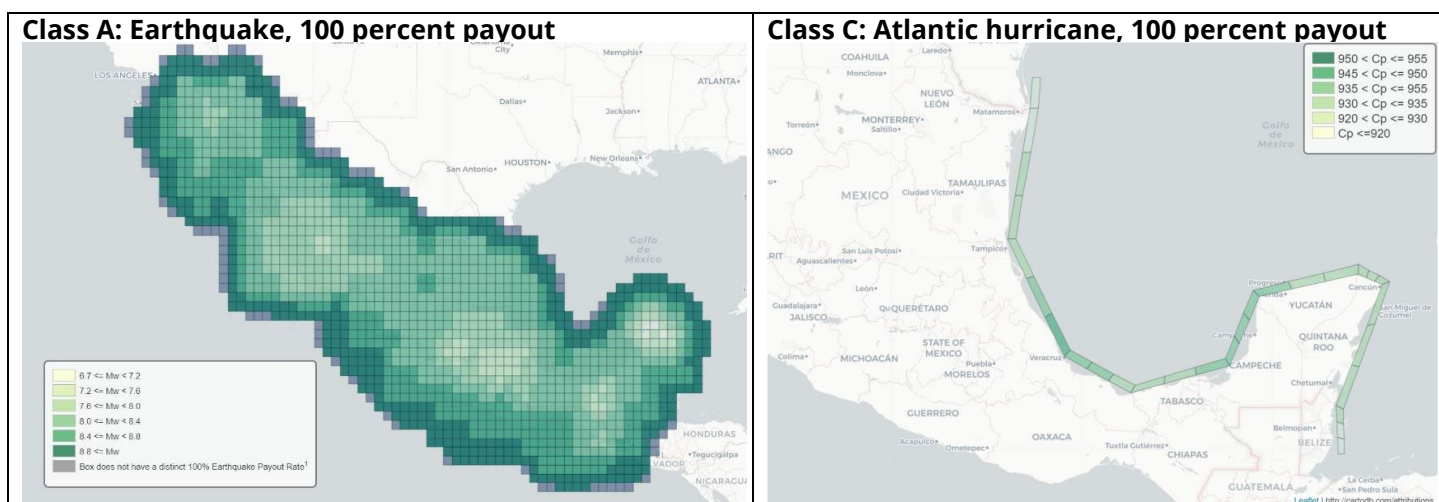
### World Bank’s Role

In addition to issuing the cat bonds, the World Bank managed the structuring, documentation, marketing, and execution of this transaction, leveraging its experience and reputation, large institutional investor base, and bond issuance infrastructure, including its capital-at-risk notes program.

The World Bank procured external service providers for the transaction, including GC Securities, Aon Securities, and Munich Re as lead managers, and AIR Worldwide as risk modeler and calculation agent.

<sup>1</sup> The illustrated structure is simplified. For example, the risk transfer from Mexico is intermediated by Agroasemex, a Mexican Government insurance company, and Munich Re as a fronting reinsurer.

## Parametric structures, classes A and C



## Outcome

The transaction received strong support attracting more than 30 investors globally. It was the largest cat bond transaction for Mexico, and the biggest single-country cat bond transaction for a sovereign. Mexico is paying a risk margin ranging from 4% to 13.5%, and the probability of a payout (attachment probability) ranges from 1.17% to 7.96%.

## Cat bond investor characteristics

Geographical base		Investor Type	
Europe	40%	ILS Fund	68%
North America	44%	Asset Managers	17%
Bermuda	14%	Insurer / Reinsurer	9%
Asia	2%	Pension Funds	6%

## Transaction Summary

Class	Class A	Class B	Class C	Class D
<b>Perils</b>	Low risk earthquake	High risk earthquake	Atlantic hurricane	Pacific hurricane
<b>Coverage amount</b>	\$225 million	\$70 million	\$125 million	\$175 million
<b>Risk period</b>	4 years	4 years	4 years	4 years
<b>Trigger type</b>	Cat-in-a-grid	Cat-in-a-grid	Cat-in-a-gate	Cat-in-a-gate
<b>Payout structure</b>	Stepped linear payout function: 30% to 70% and 70% to 100% of principal			
<b>Risk statistics (annual):</b>				
<b>Expected loss</b>	0.90%	5.84%	5.69%	4.09%
<b>Attachment prob.</b>	1.17%	8.30%	7.96%	6.26%
<b>Exhaustion prob.</b>	0.48%	3.76%	4.01%	2.54%
<b>Risk margin</b>	4.0%	11.0%	13.5%	12.0%

2/27/2025

 Contact: **Michael Bennett**, Manager, Market Solutions and Structured Finance, The World Bank Treasury

✉ mbennett1@worldbank.org ☎ +1 (202) 458 5099 📍 1225 Connecticut Avenue NW, Washington, D.C., 20433, U.S.A.