

## CASE STUDY

# Insuring Mexico against Natural Disasters

## OVERVIEW

The World Bank Treasury issued Catastrophe bonds (CAT bonds) for Mexico's FONDEN (Fondo de Desastres Naturales – Natural Disasters Fund) to provide insurance coverage against losses caused by earthquakes and hurricanes for four years.

## Background

Mexico is one of the world's 30 most exposed countries to natural hazards. With 41% of its territory and 31% of its population exposed to hurricanes, storms, floods, earthquakes, and volcanic eruptions, the costs of post-disaster reconstruction of public assets and low-income housing averages US\$880 million per year<sup>1</sup>.

FONDEN was established by the Federal Government of Mexico to support ex-post disaster risk management activities related to emergencies, recovery, and reconstruction. FONDEN finances its operations using the federal budget and market-based risk transfer instruments (insurance and CAT bonds).

FONDEN is one of the world's most advanced financial vehicles for managing disaster risk and first issued a CAT bond in 2006, which was renewed and expanded in 2009, 2012, 2017, and 2018.

The World Bank has supported Mexico's CAT bond program since 2005 and issued CAT bonds covering Mexico's risk in 2017 and 2018. In 2018, the World Bank issued a \$1.4 billion CAT bond for Mexico and the three other members of the Pacific Alliance (Chile, Colombia, and Peru).



*Mexico earthquake 09/19: Aftermath in Xochimilco /istock*

## Financial and Project Objectives

- Replace the hurricane and earthquake insurance cover that expires in December 2019 and February 2020, respectively.
- Seek cover for a more extended period.
- Explore a more granular CAT-in-a-grid trigger for the earthquake cover and an enhanced design for the hurricane triggers.

## Financial Solution

In March 2020, the World Bank issued four tranches of CAT bonds for Mexico's FONDEN, providing US\$485 million of insurance cover for earthquakes and hurricanes for four years.

Mexico pays an insurance premium for the coverage, which the World Bank transfers to the CAT bond investors. The premium is fixed during the life of the bond, removing the uncertainty of the cost.

The type of events that will trigger a payout are pre-defined based on the requirements of Mexico. If, and when a qualifying event occurs, Mexico will issue a notice to the independent calculation agent to

<sup>1</sup> <https://www.worldbank.org/en/results/2013/09/04/disaster-risk-management-mexico>

determine the insurance payouts.

The World Bank will transfer the payouts to Mexico as soon as a calculation report is available, within approximately one month for earthquake and five months for hurricane events, without the need to assess real losses incurred by the country.

## Transaction Structure and Summary

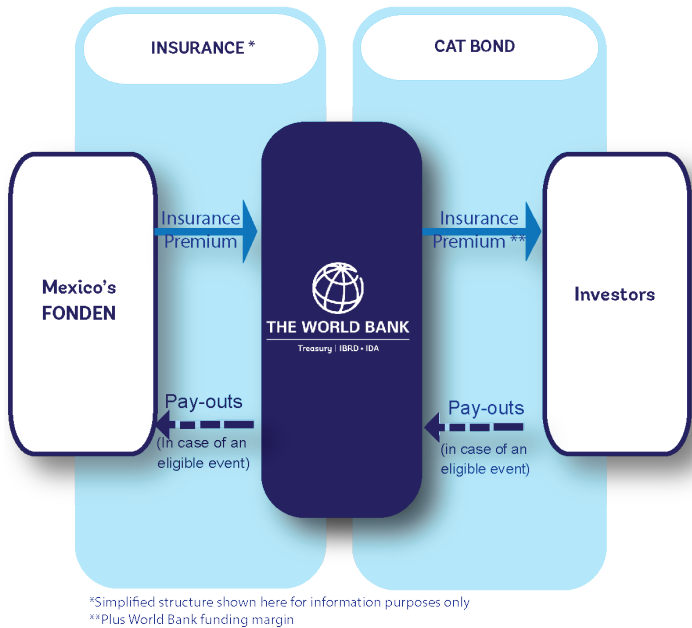


Figure 1

## Outcome

The CAT bond attracted 38 investors globally, ranging from dedicated CAT bond funds, asset management companies, pension funds, hedge funds, and reinsurance companies.

<b>Currency</b>	US\$
<b>Class</b>	Class A Earthquake low frequency Class B Earthquake high frequency Class C Atlantic Hurricane Class D Pacific Hurricane
<b>Notional (Max Payout)</b>	Total cover: US\$485 million • Class A US\$175 million • Class B US\$60 million • Class C US\$125 million • Class D US\$125 million
<b>Tenor (Term)</b>	4 years
<b>Payout Structure</b>	Piecewise linear payout function
<b>Trigger Basis</b>	Parametric, per occurrence
<b>Trigger Type</b>	Earthquake: CAT-in-a-grid Hurricane: CAT-in-a-grid (gates)
<b>Expected Loss / Attachment Probability</b>	Earthquake low frequency: 0.90%/1.17% Earthquake high frequency: 5.78%/8.30% Atlantic Hurricane: 5.79%/8.29% Pacific Hurricane: 4.06%/6.23%
<b>Pricing/Premium Multiple</b>	Earthquake low frequency: 3.5%/3.89 Earthquake high frequency: 9.0%/1.56 Atlantic Hurricane: 10.0%/1.73 Pacific Hurricane: 6.5%/1.60

Figure 2

Mexico and the World Bank have been long term partners in disaster risk management, regularly collaborating to lock in funding for disaster relief before the event happening, rather than relying only on public budgets after the event. The 2012 and 2017 CAT bonds triggered payouts to FONDEN following hurricane Patricia in 2015 and major earthquake events in 2017, respectively.

### Mexico-World Bank collaboration in CAT Bonds

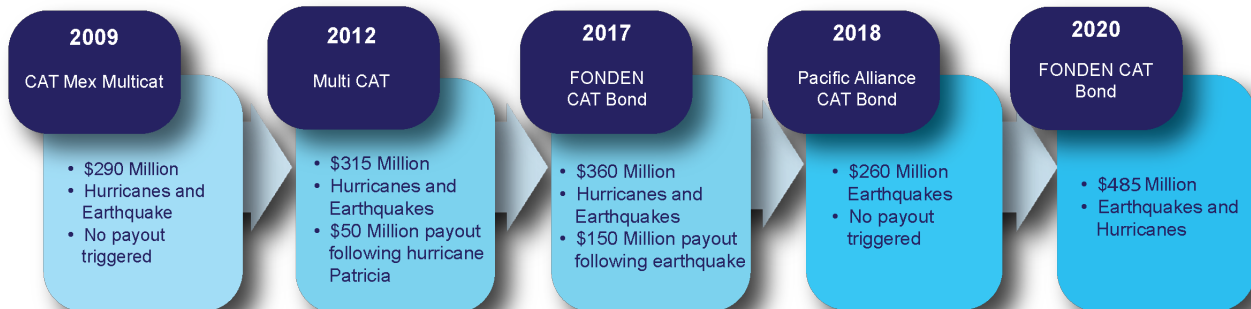


Figure 3