

Catastrophe bonds and insurance-linked securities

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A catastrophe bond is issued by a special purpose vehicle, usually domiciled in Bermuda, the Cayman Islands, Ireland or another jurisdiction with suitable legislation. The vehicle enters into a reinsurance contract with the sponsor, which may be an insurer, reinsurer, government or corporation, and issues notes to investors. The proceeds are held in a collateral trust and invested in safe assets, usually money market funds or short-term government securities. If no defined event occurs during the term, typically three or four years, the investors receive their principal back with interest. If the event occurs, the collateral is used to pay the sponsor and the investors lose part or all of their principal.¹

The trigger that defines the event can take several forms. An indemnity trigger pays according to the actual losses of the sponsor, which gives the sponsor the closest match to its exposure but requires investors to rely on its claims handling. An industry loss trigger pays according to the losses of the whole insurance industry, as estimated by an independent agency. A parametric trigger pays when a physical parameter, such as the magnitude of an earthquake at a given location or the wind speed of a hurricane, exceeds a threshold. Modelled loss triggers, finally, run the parameters of the event through an agreed model of the sponsor's portfolio.² The choice involves a trade-off between basis risk, which is the risk that the payment differs from the actual loss, and moral hazard and transparency for investors. For European windstorm risks, the industry loss estimates are provided by PERILS AG, a company founded in Zurich in 2009 by several insurers and reinsurers.³

Swiss Re has been one of the main sponsors, arrangers and analysts of the market since its beginnings. It has used catastrophe bonds to protect its own portfolio, arranged transactions for clients through its capital markets unit and published a cat bond index that tracks the total return of the market. In 2003 it issued a bond covering the risk of extreme mortality

through a vehicle named Vita Capital, which opened the market for life risks.⁴ Governments and international organisations have become sponsors as well. Mexico has protected itself against earthquakes and hurricanes with bonds arranged by the World Bank since 2006. Several Latin American states joined in a common issue in 2018. The pandemic bonds issued by the World Bank in 2017 for its Pandemic Emergency Financing Facility paid out in 2020 after the outbreak of COVID-19. Their complex triggers, which delayed the payment for months, drew criticism and showed the limits of parametric design for slow-moving events.⁵

The market has grown substantially. After a temporary setback following the hurricanes of 2017 and the losses of the following years, the volume of outstanding catastrophe bonds reached about fifty billion US dollars by 2025, according to the data collected by specialised publications. Including collateralised reinsurance, sidecars and industry loss warranties, insurance-linked securities account for about one hundred billion US dollars of reinsurance capacity, a significant share of the global property catastrophe reinsurance market.⁶ Pension funds, endowments, sovereign wealth funds and specialised fund managers are the principal investors.

1 Notes

1. On the structure of catastrophe bonds (special purpose reinsurance vehicle, collateral trust, risk period, trigger), see the literature on insurance-linked securities and the transaction documents summarised by rating agencies. To be verified. ↩
2. On the types of trigger (indemnity, industry loss, parametric, modelled loss) and the associated basis risk, see the literature on insurance-linked securities. To be verified. ↩
3. On PERILS AG (Zurich, founded 2009), which provides industry exposure and loss data for natural catastrophe events in Europe and other regions used in industry loss triggers, see the publications of PERILS AG. To be verified. ↩
4. On Swiss Re's role in the catastrophe bond market, the Swiss Re Global Cat Bond Index and the Vita Capital mortality bond (2003, USD 400 million), see the publications of Swiss Re and the literature on insurance-linked securities. Figures to be verified. ↩
5. On the catastrophe bonds sponsored by Mexico (from 2006) and the Pacific Alliance joint issuance (2018) and on the World Bank pandemic bonds of June 2017 (USD 320 million) and their payout in April 2020 (about USD 196 million), see the publications of the World Bank Treasury and the critical literature. Figures to be verified. ↩

6. On the volume of outstanding catastrophe bonds (about USD 50 billion in 2025) and of the alternative reinsurance capital (about USD 100 billion or more), see the market data of Artemis, the reports of Aon Securities and Swiss Re Capital Markets and the publications of the rating agencies. Figures and status to be verified. ↩

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