POLICY BRIEF

A Holistic Approach to Sovereign Debt Crises: Strengthening Fiscal Resilience to Disasters Through the G20

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Financing for Sustainable Development

Abstract

Catastrophe bonds are gaining traction as a risk-transfer mechanism, providing post-disaster liquidity without increasing governments' debt burdens. These bonds aim to deliver rapid funding while protecting national budgets and preserving fiscal space in the aftermath of a disaster. While the potential of catastrophe bonds as part of a diversified disaster risk resilience strategy is significant, challenges remain. With extreme weather events becoming more frequent and severe, this policy brief highlights the need for stronger financial preparedness to enhance resilience, particularly critical for countries already burdened by high sovereign debt. It provides an overview of current developments in the catastrophe bond market and outlines key concerns. It concludes by outlining how the G20 could enhance knowledge, accessibility, and transparency in the catastrophe bond market, while also emphasising the need to balance financial innovation with long-term disaster risk reduction.

Keywords: Disaster Risk Financing, Physical Risk, Catastrophe Bond, Extreme Weather Event

Diagnosis

Extreme weather events and the role of disaster risk finance

Extreme weather events are increasing in frequency and severity due to climate change,[1] posing substantial risks to humanity, nature and the built environment. In addition to the impact of acute climate risk on debt costs,[2] a significant challenge is the scarcity of adequate and predictable financial resources for adaptation.[3] Even a decade after a major hurricane event, economic damage can continue to lead to declines in tax revenues, public expenditure and debt financing.[4] Subsequently, sovereign credit ratings deteriorate, which in turn increases the cost of debt for governments,[5] threatening economic stability and long-term development. In response, governments have often relied on budget reallocations, increased borrowing and official development assistance to cover the financial costs of disasters. However, the rising frequency and severity of climate-induced disasters, combined with cuts in foreign aid, places immense strain on the economies least equipped to fund recovery and reconstruction, requiring alternative responses.

Policymakers are increasingly considering different options to finance recovery from climate-induced disasters. However, with less than 2% of the US$76 billion in crisis financing in 2022 coming from to pre-arranged instruments,[6] such as

[1] The annual global costs of extreme weather attributable to climate change amounted to US$143 billion over the period 2000–2019 (Rebecca Newman and Ilan Noy. "The global costs of extreme weather that are attributable to climate change." *Nature Communications* 14 (2023): 6103. https://doi.org/10.1038/s41467-023-41888-1.
[2] Mark V Bernhofen, Michael Burke, Arunkumar Puranasamriddhi, Nicholas Ranger and Gaurav Shrimali. *"Integrating Physical Climate Risks and Adaptation into Sovereign Credit Ratings". Smith School of Enterprise and the Environment and Environmental Change Institute, University of Oxford* (2024).
[3] Mitota P Omolere. "Climate Adaptation: Assessing the Progress on the Implementation of the Global Goal on Adaptation." *Earth.org*. (2024) https://earth.org/assessing-the-progress-on-global-goal-on-climate-adaptation/.
[4] Rhiannon Jerch, Matthew E Kahn and Gary C. Lin. "Local public finance dynamics and hurricane shocks." *Journal of Urban Economics* 134 (2023): 103516. https://doi.org/10.1016/j.jue.2022.103516.
[5] Patrycja Klusak, Matthew Agarwala, Matt Burke, Moritz Kraemer, and Kamiar Mohaddes. "Rising Temperatures, Falling Ratings: The Effect of Climate Change on Sovereign Creditworthiness." *Management Science* 69, no. 12 (2023): 7468–7491. https://doi.org/10.1287/mnsc.2023.4869.
[6] Michèle Plichta and Lydia Poole. "The State of Pre-arranged Financing for Disasters 2024" *Centre for Disaster Protection* (2024). https://www.disasterprotection.org/publications-centre/the-state-of-pre-arranged-financing-for-disasters-2024

contingent disaster loans, grants and insurance from regional risk pools, there remains room to strengthen financial preparedness by expanding the use of such instruments. In recent years, catastrophe bonds have gained traction as an additional disaster risk finance (DRF) instrument.

Catastrophe bonds are a type of insurance-linked security that transfers specific risk exposures to capital markets. They represent a niche financial instrument, albeit one whose coverage is rapidly expanding. While this has been largely driven by issuances from the insurance and reinsurance industry, catastrophe bonds are also increasingly of interest to sovereign states (see Figure 1 for geographical and risk coverage and Table 1 for more details).[7] Investors are increasingly interested in the catastrophe bond market, drawn to its attractive yields and low correlation with conventional market risks. Catastrophe bonds are being discussed in contexts such as the following:

- In developed economies, corporate entities are slowly exploring options to issue catastrophe bonds and financial regulators are increasingly interested in the role they could play to reduce the insurance protection gap. For example, the European Insurance and Occupational Pensions Authority considers expanding the use of catastrophe bonds for high-risk events by fostering the growth of local markets and encouraging EU-wide risk pooling.[8] The Monetary Authority of Singapore has conducted education sessions with investors to inform them about insurance-linked securities.[9]
- In emerging markets and developing countries, issuances through multilateral development banks and the coverage of secondary perils such

[7] In January 2025 sovereign catastrophe bonds made up about 2.55% of overall market volume.
[8] European Insurance and Occupational Pensions Authority. *Policy Options to Reduce the Climate Insurance Protection Gap: Discussion Paper* (2023). https://www.eiopa.europa.eu/document/download/f472de85-ec4c-4dfe-b62f-841b43b38965_en?filename=ecb.policyoptions_EIOPA~c0adae58b7.en_.pdf;
EIOPA. *Towards a European System for Natural Catastrophe Risk Management: The Possible Role of European Solutions in Reducing the Impact of Natural Catastrophes Stemming from Climate Change* (2024). https://www.ecb.europa.eu/pub/pdf/other/ecb.climateinsuranceprotectiongap_EIOPA202412~6403e0de2b.it.pdf;
[9] Monetary Authority of Singapore [MAS]. "*Growth and Opportunities in the ILS Market: A Singapore Perspective" (2024)*. https://www.mas.gov.sg/news/speeches/2024/growth-and-opportunities-in-the-ils-market.

as floods and droughts are expected to grow, as the World Bank aims to increase its issuances on behalf of countries by 400% by 2028.[10] Pooled insurance solutions like the Caribbean Catastrophe Risk Insurance Facility have long existed and used catastrophe bonds in the past. There are also efforts underway to design a dedicated Caribbean catastrophe bond.

There are several ongoing debates and concerns around the use of catastrophe bonds, including basis risk,[11] cost-effectiveness, or limitations of catastrophe risk models in capturing changes driven by climate change.[12] Designing an instrument that appeals to both investors and governments remains a balancing act, involving trade-offs between the extent of risk coverage and the cost of premium. Past instances of non-payouts and concerns about the 'financialisation' of disasters[13] have sparked public concerns, particularly over the ethical dimensions of profiting from human suffering. An overemphasis on financial instruments could divert resources and attention from investments in long-term disaster risk reduction measures, such as infrastructure improvements. Access to instruments like catastrophe bonds depends on a country's awareness, expertise and ability to navigate complex financial processes. Weak financial capacity and infrastructure as well as data gaps pose additional barriers. Currently, the World Bank is the only multilateral development bank issuing these bonds on behalf of governments, creating a bottleneck and heightens access and equity concerns, especially for first-time issuers that rely on external support.

[10] Steve Evans. " World Bank believes it could grow its cat bond issuance 400% in five years." *Artemis*, (2023). https://www.artemis.bm/news/world-bank-believes-it-could-grow-its-cat-bond-issuance-400-in-five-years/

[11] 'Basis risk' is a when the actual losses experienced, and the bond payout size differ. Parametric triggers benefit from rapid disbursement of the principal following the occurrence of a triggering event. However, the bond sponsor (e.g. the government) is faced with the prospect of potential losses from an event that exceed the principal by a significant margin. The sponsor is therefore subject to a greater degree of uncertainty than the investor. As for the investor, the potential loss of their initial investment represents the worst-case scenario.

[12] For example, shifting paths of tropical cyclones leads to new communities being affected and the promotion of electric vehicle infrastructure could give rise to new types of risks.

[13] Naomi Klein. "*The Battle for Paradise: Puerto Rico Takes on the Disaster Capitalists.*" *Haymarket Books* (2018); Razmig Keucheyan. "Insuring Climate Change: New Risks and the Financialization of Nature." *Development and Change* 49 (2018): 484–501. https://doi.org/10.1111/dech.12367; Keston K. Perry. "The new 'bond-age', climate crisis and the case for climate reparations: Unpicking old/new colonialities of finance for development within the SDGs." *Geoforum* 126 (2021): 361–371. https://doi.org/10.1016/j.geoforum.2021.09.003.

Catastrophe bonds can play a role as part of a diversified disaster risk management approach within sovereign debt strategies; however, they are not a panacea and must be implemented with transparency and a clear understanding of their inherent limitations.

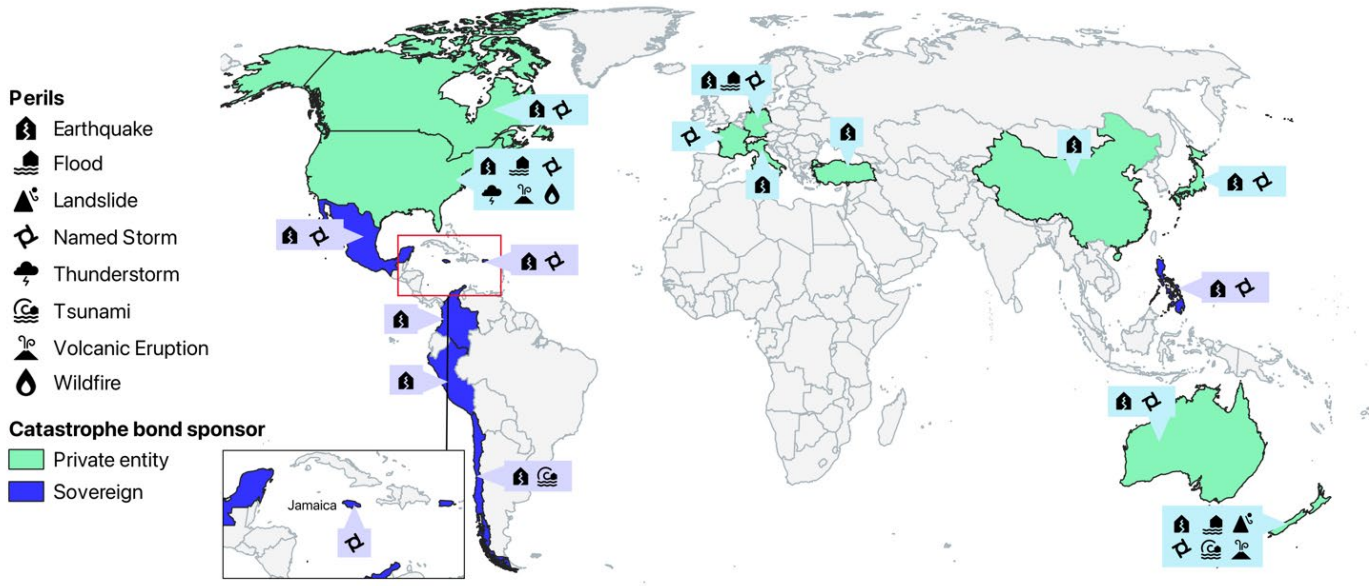

Figure 1: Global distribution of catastrophe bond issuances[14]

Recommendations

Recommendations to promote best practices in the catastrophe bond market

With climate change increasing the frequency and severity of extreme weather events, a holistic approach to sovereign debt crises must ensure that countries have adequate DRF strategies and suitable instruments in place. To strengthen fiscal resilience and ensure long-term financial sustainability, catastrophe bonds

[14] Lea Reitmeier, Denyse S. Dookie and Viktor Rözer. "Financing the unpredictable." (2025).

can play a role in providing pre-arranged financial support. As part of a broader consideration of how to bear the costs of disasters, and mindful of their limitations, the G20 could engage in different ways:

Support the establishment of a clear reporting framework. Information on bond structures, event definitions, risk models, payout mechanisms, and fund allocation after a payout should be publicly available for all sovereign transactions. A reporting framework should define what information to disclose, how to present it, and the required level of detail.[15] Greater transparency would not only help build knowledge among government officials, NGOs and the public, but also facilitate more academic research.

Encourage more transparency around the role of catastrophe bonds in sovereign credit ratings. Some rating agencies have recognised catastrophe bonds for strengthening disaster risk mitigation without increasing national debt.[16] However, to enhance their role in disaster risk management and the sovereign debt crises (by reducing borrowing costs and improving capital access), their positive impact on sovereign credit ratings must be firmly established. Therefore, the G20 should engage with rating agencies to ensure better consideration of catastrophe bonds in sovereign credit ratings and to promote greater transparency in how they are assessed. This would provide an additional incentive for countries seeking to reduce their debt burden to issue catastrophe bonds.

Address challenges related to investor preferences for new regions and risks. Without investor interest, a catastrophe bond issuance cannot succeed. Engaging with insurance-linked securities investors can help identify challenges related to unfamiliar regions or risks, assess their investment willingness, and

[15] Insights can be drawn from the International Capital Market Association's Green Bond Principles, which offer guidance for both pre- and post-issuance, including impact and allocation reporting.
[16] Fitch Ratings. *Jamaica Dashboard: Cat Bond Adds New Layer of Protection Against Hurricanes* (2021) https://www.fitchratings.com/research/sovereigns/jamaica-dashboard-cat-bond-adds-new-layerof-protection-against-hurricanes-15-09-2021.

address barriers. A key aspect of this engagement is identifying enabling factors that differ for different trigger structures (eg, parametric or indemnity), such as the required data granularity. Additionally, broadening outreach to other investor types, such as pension funds or sustainability investors, could help diversify the investor base.

Foster collaboration and knowledge exchange between countries to reduce reliance on external technical support. Expanding training initiatives and fostering international knowledge exchange would enable more countries to independently assess whether catastrophe bonds fit within their DRF strategies. By improving technical knowledge, decision-makers can better evaluate these instruments and the trade-offs they come with.

Address equity concerns in design and use by working with local communities. There should be efforts to actively prevent the over-financialisaton of disaster relief, by making sure that these bonds are a part of a larger plan that includes long-term disaster risk reduction. Local communities and stakeholders should be involved in the design and implementation. For example, through consultations, integration of local knowledge into risk assessments, and transparent communication about bond structures and payout mechanisms. Their knowledge of local vulnerabilities and needs is essential for developing effective and responsive instruments.

Strengthening disaster resilience, reducing fiscal risks and supporting sustainable development are key priorities in the face of escalating climate-related threats. Catastrophe bonds are not a silver bullet, but they can serve as a valuable complementary tool for some countries within a broader DRF strategy. This policy brief highlights key concerns and outlines how the G20 can convene stakeholders, foster dialogue, and promote best practices to enhance knowledge, accessibility, and transparency in the catastrophe bond market

Appendix

Table 1: Overview of sovereign catastrophe bond transactions and selected characteristics [17]

Year	Sponsor	Peril	CAR identifier	Issuance size (principal) (US$ million)	Expected loss (%)	Risk multiple	Estimated premium costs (US$ million)	Payout thresholds (%)				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
								25	50	75	100												
2017	Government of Mexico	Earthquake	CAR 113	150	3.43	1.31	1.06	X	X	X	X	Trigger event: 08.09.2017 Trigger breach calculated: 11.10.2017 Payout received: US$150m (100% of principal)											
2017	Government of Mexico	Named storm (Atlantic)	CAR 114	100	5.56	1.67	18.60	X	X		X	Trigger event: 22.10.2018 Trigger breach calculated: 23.10.2018 No payout received											
2017	Government of Mexico	Named storm (Pacific)	CAR 115	110	3.96	1.49	12.98	X	X		X												
2018	Republic of Chile	Earthquake	CAR 116	500	0.86	2.91	37.50	30		70	X												
2018	Republic of Colombia	Earthquake	CAR 117	400	1.56	1.92	36.00	X	X		X												
2018	Government of Mexico	Earthquake	CAR 118	160	0.79	3.16	8.00		X		X												
2018	Government of Mexico	Earthquake	CAR 119	100	6.54	1.26	16.50		X		X												
2018	Republic of Peru	Earthquake	CAR 120	200	5.00	1.20	29.89	30		70	X		Trigger event: 27.05.2019 Trigger breach calculated: 20.06.2019 Payout received: US$60m (30% of principal)										
2019	Republic of the Philippines	Earthquake	CAR 123	75	3.00	1.83	12.38	35		70	X												
2019	Republic of the Philippines	Named storm (Pacific)	CAR 124	150	3.00	1.88	22.73	35		70	X			Trigger event: 22.12.2021 Trigger breach calculated: 24.01.2022 Payout received: US$52.5m (35% of principal) Trigger event: 19.04.2022 Trigger breach calculated: 23.05.2022 No payout received Trigger event: 26.09.2022 Trigger breach calculated: February 2023 No payout received									
2020	Government of Mexico	Named storm (Atlantic) (riskier)	CAR 125	175	0.90	3.89	24.50	X	X	X	X												
2020	Government of Mexico	Named storm (Pacific)	CAR 126	60	5.78	1.56	21.60	X	X	X	X												
2020	Government of Mexico	Named storm (Atlantic)	CAR 127	125	5.61	1.78	50.00	X	X		X				Trigger event: 25.10.2024 Trigger breach calculated: April 2024 Payout received: US$60m (48% of principal)								
2020	Government of Mexico	Earthquake (incl. tsunami impacts)	CAR 128	125	4.06	1.60	32.50	X	X		X												
2021	Government of Jamaica	Earthquake	CAR 130	185	1.52	2.89	19.54	30*															
2023	Republic of Chile	Earthquake	CAR 131	350	1.00	4.75	49.88	30		70	X												
2024	Government of Mexico	Earthquake	CAR 132	225	0.90	4.44	36.00	X	X	X	X												
2024	Government of Mexico	Earthquake (riskier)	CAR 133	70	5.84	1.88	30.80	X	X	X	X												
2024	Government of Mexico	Named storm (Atlantic)	CAR 134	125	5.69	2.37	67.50				X												
2024	Government of Mexico	Named storm (Pacific)	CAR 135	175	4.09	2.93	84.00	X*															
2024	Government of Jamaica	Named storm (Atlantic)	CAR 136	150	1.50	4.67	37.63	30*															
2024	Government of Puerto Rico	Named storm (Atlantic) and earthquake	N/A	85	1.65	5.45	22.31	*															

*Transactions that use a linear sliding scale CAR = Capital-at-Risk issuance Estimated premium costs = Principal * coupon * bond duration Source: Artemis Deal Directory (2024) ■ Payout has been made ■ No payout

[17] Lea Reitmeier, Denyse S. Dookie and Viktor Rözer. "Financing the unpredictable." (2025).

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