

AIR: A Global Leader in Cat Modeling for ILS

AIR is uniquely positioned to support catastrophe bond issuances. Since modeling the risk for the very first publicly issued catastrophe bond (George Town Re Ltd.) in 1996, AIR has modeled the risk for more than USD 68 billion in total limit issued industrywide out of the approximately USD 103 billion in total issuance since market inception.

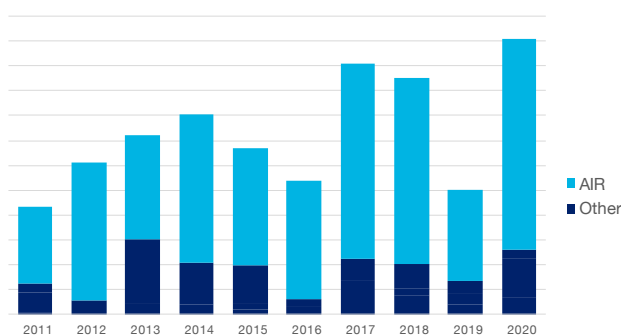


Since 2011, AIR has supported more than 80% of public 144A property catastrophe issuances, measured both by deal count and total issuance amount.¹ AIR has worked not only with a number of different entities, but also on a number of market firsts, including: the largest-ever single catastrophe bond transaction (Everglades Re 2014-1); the first catastrophe bond to include European flood losses (Lion II Re DAC); and the first catastrophe bond to support the World Bank Pandemic Emergency Financing Facility (IBRD CAR 11-112). In addition to these industry firsts, AIR has supported the United States' largest insurers to help bring regular issuances to market.

In recent years, AIR has supported initiatives focused on fostering global resilience, working with organizations such as the World Bank as well as national governments, in an effort to provide risk-transfer solutions and aid in capacity-building missions. These initiatives have required AIR to accommodate a variety of structures, ranging from leveraging our existing models to issue public 144A Catastrophe Bonds such as the Pacific Alliance's IBRD CAR 116-119, all the way through to building new models to support the Pacific Catastrophe Risk Assessment and Financing Initiative (<http://pcrafi.spc.int/>). Our team

can work with both clients and investors: We ensure that the final structure of a catastrophe bond meets with client requirements; and our team helps investors understand the risk being ceded.

Issuance Volume by Modeling Agent



AIR Worldwide's Support for Catastrophe Bonds Since 2011

Number of Public 144a Catastrophe Bond Transactions	239
Number of Public 144a Catastrophe Bond Classes of Notes	342
Number of Transactions with Parametric Trigger	25
Number of Transactions for Public Entities	18

Source: Artemis Deal Directory. All figures cover the period 2011 to 2020 and are accurate as of January 2021

AIR's Insurance-Linked Securities Practice

Management Team

Once engaged, AIR's Consulting and Client Services group will assign an experienced, senior consultant to lead the project and begin the risk assessment process. The project leader engages a team of consultants and analysts with the necessary experience to perform a comprehensive analysis as required and will ensure the timely completion of all tasks. In addition to a team of skilled consultants, the project will be managed by the following senior management team:



Rob Newbold, Executive Vice President

Rob Newbold is responsible for the Americas Business Development team and for providing support and client services to AIR clients in the Americas and Bermuda. His primary responsibilities include project management and the delivery of catastrophe modeling software and services for insurers, reinsurers, intermediaries, and the capital markets. Mr. Newbold has managed more than 200 ILS transactions during his 18-year tenure at AIR, including Merna Re Ltd. in 2007.

Mr. Newbold received his MBA and M.S. in Information Systems from Boston University Graduate School of Management. He received a B.S. in Systems Engineering from the University of Virginia and has achieved the designation of Certified Extreme Event Modeler by completing the requirements of the AIR Institute Certification Program.

AIR Services

AIR's work on a securitization project has several parts:

- Risk analysis
- Rating agency due diligence support
- Advice on and development of offering
- Marketing and transactional documentation
- Risk modeling and expertization
- Investor meetings
- Calculating resets and growth limitation factors (if needed)



Vincent Errera, Assistant Vice President, Insurance-Linked Securities

Vincent Errera is an AVP in the insurance-linked securities market segment within AIR's Consulting and Client Services group. As a member of AIR's securities team since 2012, Mr. Errera has been involved in the modeling of many catastrophe bond issuances comprising a range of covered perils, regions, and trigger types. Prior to joining AIR, Mr. Errera served as a Sergeant in the United States Marine Corps as a Reconnaissance Operator/Signals Intelligence Analyst. He holds a B.S. and an M.S. in Finance from the University of Massachusetts and has achieved the designation of Certified Extreme Event Modeler by completing the requirements of the AIR Institute Certification Program.

Issuance Services



Risk Analysis

AIR will use our existing models to perform a probabilistic analysis using our robust catalog(s) of simulated events, together with a deterministic analysis consisting of select historical events. The output of these model runs are modeled loss estimates for simulated and historical events, which can be used for: designing a trigger, performing a basis risk analysis, and summarizing the risk of natural catastrophes for the portfolio. This analysis can be conducted using either exposure information provided directly by the client, or through use of AIR's Industry Exposure Database—a database containing replacement values, construction, occupancy, and other pertinent information for all insurable properties within the relevant country.



Trigger Design

If necessary, AIR can assist with defining the objectives and constraints that will inform the trigger design for a given issuance. This service can be used to ensure that parametric or modeled loss triggers are fit for purpose. For example, should there be a budgetary constraint for the cost of risk transfer (i.e., the coupon rate of the bond paid by the client), then that constraint can be translated into a risk metric, specifically an expected loss percentage, that will serve as the basis for constraining the trigger options during the design process.



Risk Analysis Documentation and Expertization

Once the structure is finalized, AIR will create the risk analysis documentation to include the assumptions, methodology, and results obtained from the analysis. AIR will request feedback from both the client and legal counsel in preparing the final documentation. This process can require additional analyses, post-processing of modeling results, and reformatting of certain calculations. AIR's goal is to present accurate disclosure information to investors transparently.

Finally, AIR will provide the statistical data, risk modeling, and associated explanations included in the offering circular for a catastrophe bond. AIR will stand as an expert in modeling techniques and the analysis of risks associated with the appropriate peril.



Rating Agency Due Diligence Support

If requested by the client, AIR will meet with representatives of rating agencies to explain AIR's modeling approach, assumptions, and results. In addition, AIR will perform sensitivity analyses and stress testing to provide the rating agencies with information they request to rate the catastrophe bond, commensurate with what they consider to be the associated underlying risks.



Investor Meetings

If requested, AIR senior level executives will meet with investors to explain the modeling results and answer any questions regarding AIR's methodology, data, and assumptions (i.e., to conduct the "Road Show" for the security). These meetings can be conducted either in person or via conference call.

In addition, depending on the transaction structure, the following services may be required: resets (to ensure the risk remains in sync with the coupon payments) and post-event loss calculations (should a determination need to be made as to whether and how much a given event impacted a security).

Post Placement Services



Resets

If required, AIR will perform an updated risk analysis using either an escrowed version of the model or the most current release of the model, depending on the transaction structure, and an updated portfolio of exposure. The purpose of this analysis is to provide an updated view of the risk that reflects changes to the underlying exposures used in the initial issuance.



Growth Limitation Factor

For indemnity transactions, upon request by the sponsor, following a loss occurrence that may erode the principal of the notes, AIR will calculate a growth limitation factor (GLF) based on a modeled average annual loss (AAL) of the portfolio in force at the time of an event.



Event Reports

When requested, for industry index, modeled loss, and parametric transactions, AIR will generate a report detailing loss and payment information for a given actual event.

Additional Resources

For more information regarding AIR's work on Insurance-Linked Securities and Resilience, please follow the below links:

[A Pandemic Emergency Facility to Protect the Poorest Countries – AIR *InFocus* blog post](#)

[How Catastrophe Models Help Cities Boost Resilience – AIR *InFocus* blog post](#)

[Philippines Launches Innovative Insurance Program to Boost Natural Disaster Risk Management – Press Release](#)

[Public-Private Partnerships to Aide Developing Nations' Disaster Risk Financing – AIR *InFocus* blog post](#)

[So You Want to Issue a Cat Bond – AIR *Current*](#)

[World Bank Affirms Position as Largest Sovereign Risk Insurance Provider with Multi-Country Earthquake Bond – Press Release](#)



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