

Article Title: ARCHIVE | Criteria | Insurance | Specialty: Approach To Rating Indemnified Natural Catastrophe Insurance-Linked Securities Data: (EDITOR'S NOTE: — This article is no longer current. It has been superseded by "Rating Natural Peril Catastrophe Bonds: Methodology And Assumptions," published Dec. 18, 2013.) All natural catastrophe (nat-cat) bonds share some common features; however, certain features are specific to indemnified bonds, as opposed to non-indemnified bonds (such as industry loss, modeled loss, and parametric bonds). This article follows on from "Criteria | Insurance | Specialty: Methodology And Assumptions Used For Rating Natural Catastrophe Insurance-Linked Securities," published on Sept. 11, 2008, and focuses specifically on the issues relevant to indemnified nat-cat bond structures. Indemnified Bonds Are Viewed Differently Indemnified nat-cat bonds are much more closely related to the practices of the ceding company than non-indemnified structures. The risks borne by noteholders are directly affected by how the cedant underwrites its book of business, its loss estimation and claims settlement processes, and the completeness and quality of the policy data used to populate the model and generate the modeled results. When rating insurance-linked securities (ILS), Standard & Poor's Ratings Services takes a positive view of the use of parametric, modeled loss, and industry loss bonds, because they reduce uncertainty for investors, e.g., uncertainty surrounding the cedant's claims-settlement process. We are not implying that indemnified bonds always have a markedly different risk profile; rather, we are indicating that they will require an additional level of risk analysis. As a result, Standard & Poor's may request more information, in scope, type, and amount when presented with the opportunity to rate an indemnified bond than we would request when rating non-indemnity bonds. We will also request information regarding the data used to generate modeled results (in terms of both quality and completeness) and the underlying modeled loss calculations that we would be reviewing as part of the rating process. Information On The Cedant To rate an indemnified nat-cat bond, Standard & Poor's must first achieve an adequate level of understanding and knowledge of the ceding company's operations (underwriting, risk appetite, enterprise risk management, etc.). Furthermore, to maintain the ratings, this information must be refreshed and updated periodically, and augmented by a dialogue with the ceding company, as long as the rated securities remain outstanding. Optimally, we would accomplish this data exchange via an interactive process in conjunction with maintaining a public rating on the ceding company. While Standard & Poor's will consider rating nat-cat bonds issued by a ceding company we do not rate, we will only do so after achieving an understanding of, and level of comfort with, the ceding company's operations and processes (see Appendix A). Information On Data Requirements Indemnified structures depend heavily on the quality and completeness of the cedant's underwriting data, which is used to populate the model. These models are complex and the results are highly reliant on the data input into them. Input data quality The quality of the input data can have a significant impact on modeled results. Standard & Poor's places great emphasis on the quality of the data used to generate probabilities of attachment, loss, and exhaustion and will make qualitative adjustments to the calculated results based on the perceived quality of the underlying data. Standard & Poor's is interested in understanding the extent to which the ceding company audits and verifies the data, as well as the frequency of data analysis and reviews. Specific examples of the kind of information we would request include the level of geocoding, exposure measure, occupancy type, year built, number of stories, and type of construction. Input data completeness In a similar fashion, Standard & Poor's anticipates that the ceding company would also be prepared to provide information on, and discuss the completeness of, the data used in the modeling process. We may inquire about the level of unknown or incomplete information and the validation process used to check the completeness of the data, for example, the level of geocoding provided. Clearly, we do not want to encourage a situation where data fields are block coded or incorrectly coded, simply to improve the data completeness score. To this end, we would encourage issuers to perform heuristic checks on the data to ensure there is no bias or evidence of miscoding. Standard & Poor's understands that perfect data is an unattainable goal for catastrophe modeling. Where data is incomplete, we encourage the use of sensitivity analysis to identify the potential impact of that missing data on the modeled results. Standard & Poor's would look more favorably on an issuer that has a rigorous data checking process and has considered the impact of incomplete and erroneous data than on an issuer that appears to have complete data but has not or cannot perform checks on that data. Portfolio of risks We view bonds

where the subject portfolio is predominately composed of personal lines more favorably, a preference that is related to the quality and completeness of data underlying the modeled results. Furthermore, a smaller number of larger commercial risks is statistically more risky than a larger number of smaller personal lines risks. Similarly, we will typically view bonds issued by primary insurers more favorably than those from reinsurers, as the latter are one step further removed from the original policy data and consequently have less control of the quality and completeness of the input data. Third-party data review Standard & Poor's would view favorably the participation of a third party in the review of the data used to generate the modeled probabilities of attachment. We consider that the participation of a third party in the data review process could significantly mitigate the risk of any moral hazard related to selective information disclosure that might skew modeled results. We would request a copy of both the scope of the review, as well as a copy of the work product generated in this process. We anticipate that the third-party reviewer would choose any representative sample analyzed. Furthermore, we anticipate that the third party's analysis would include a discussion of the sample size used and an assessment of the potential sampling error and statistical significance of the results. Historical loss data Standard & Poor's will request information on historical events that may have caused losses to the rated obligations under consideration, as well as more granular loss information. Alignment Of Interests Standard & Poor's will review the bond structure and analyze the extent to which the ceding company's interests and those of the investors are aligned. Standard & Poor's considers this alignment of interests, both at closing as well as during the tenor of the bond, as a significant qualitative ratings issue. Our analysis would include a review of the bond documents to insure that the ceding company had a contractual obligation to maintain a defined percentage (net of any reinsurance that does not inure to the benefit of both the cedant and bond) of the coverage layer addressed by the nat-cat bond. We would view an absence of a contractual commitment to maintain a meaningful alignment of interest for the tenor of the bond unfavorably and it could have negative implications for the rating. Appendix A: Information Requests Summary of business profiles Standard & Poor's will request that the cedant provide information on various aspects of its business, including the following: Exposures and/or probable maximum loss (PML) by specific line of business (e.g., homeowners), noting any significant variations in deductible and coverage limits; Exposures and/or PML by contract type (retrocession, property/casualty reinsurance, quota share, excess of loss); Exposure by postal code (top 10); Top 10 individual exposures (specific asset/contract/treaty); and Estimate of market share. We will also request the cedant's operating and underwriting history and historical performance by line of business, including: How long have they been underwriting the covered risk? How has this book of business changed over time? A discussion of their business strategy, risk appetite, enterprise risk management, approach, etc; and Data on the persistency of the covered block of business. Management biographies Standard & Poor's will request biographies on all senior management. Underwriting guidelines Standard & Poor's will request that the cedant supply information related to its underwriting approach, its overall book of business, and the book of business being ceded. Information should include the following: Exposure limits: Exposure data should be shown with and without reinsurance; Counterparty requirements/limits; Loss mitigation practices (e.g., reinsurance) and an understanding of how the proposed nat-cat bond will affect the cedant's historical risk management strategies; Policy review practices (e.g., Is all required information obtained and included in nat-cat modeling? Are the policy and related coverages reviewed periodically?); Results of data audit: Does the company review its files to make sure the policy data is accurate; and How long have the cedant's underwriters been in the specific line of business, how long have they been working with the company, and how are they remunerated? Claims management process Standard & Poor's will request that the cedant supply information related to its claims management practices. Information should include the following: How they track and review unusual movements on incurred claims; Frequency and details of the aged (outstanding) claims review process; Details of any third-party claims adjustor reviews carried out; Details of any broker/cedant claims audits carried out; and Feedback process between the claims management, reserving and pricing functions. Historical loss data Standard & Poor's will request a list of all historical events, by covered peril, which would have caused losses to the rated obligations under consideration. Additionally, for aggregate loss structures, we request that issuers continue to show us results based on a comprehensive list for those historical events, or series of events, that would not

have triggered a loss. Input data quality With regards to data quality, Standard & Poor's will ask the issuer which of the following checks, if any, were performed on the quality of the input data used in the bond, and how frequently they were performed: A validation of the data provided by primary insurers or brokers; An audit of the data to ensure that it matches broker's submissions, values, financial structures, and limits; A quality assurance test to assess the accuracy of the information provided; Testing conducted to search for systemic bias in the data, including the use of secondary modifiers; Sensitivity testing performed around modeled outputs to gauge the potential for variance in estimated losses due to incomplete or incorrect data and model inaccuracies; and Analysis of any significant annual changes to data to ensure that they are within the cedant's underwriting guidelines. We will also ask the cedant if it has performed any other processes undertaken to verify the quality and completeness of the data used in the modeling process, including the accuracy of the data input for following: Location (street address, zip code, etc.); Occupancy type; Year built; Number of stories; Type of construction; and The presence of any peril defenses (e.g., hurricane-resistant windows). Additionally, we will ask the cedant to provide information on the following: Comparison of the total insured value to customer's market share; Assessment of appropriate use of loss mitigation credits; Proper coding of buildings; and Policy followed when data is incomplete (e.g., if all they have are zip codes for homeowners' policies in Florida, do they put the houses on the coast or inland?). Input data completeness In a similar fashion, the ceding company should also be prepared to provide information on, and discuss the completeness of, the data used in the modeling process. To do this, Standard & Poor's may request the following information: Validation of data provided by brokers; Level of geocoding provided in the data (street address, zip code); Breakdown of unknown or incomplete data by primary and secondary modifiers; How incomplete data is coded into the model; and What sensitivity testing is performed around modeled outputs to gauge the potential for variance in estimated losses due to incomplete or incorrect data and model inaccuracies. Third-party data review Standard & Poor's will request a copy of all data analysis completed by third parties. Basic dial settings Confirmation that all of the following basic model default settings are turned on when generating modeled losses. Some examples are: Demand surge; Storm surge; Fire following; Secondary uncertainty; and Details of the reasons and impact where nonstandard setting have been employed. Modeled results Typically, we would request the occurrence exceedance probability curve(s) for each peril securitized and, if appropriate the aggregate exceedance probability curve derived from at least 10,000 simulations. However, for higher-rated transactions, we would consider 100,000 simulations to be a more appropriate minimum, because this gives greater resolution in the tail. Appendix B None of these information and data requests are hard and fast requirements. However, if these details are not available for review, the bond may not be ratable or, if ratable, the ratings may reflect a significant adjusted probability of default. Differences between each bond may be nuanced, and assessment of these differences (and any subsequent adjustments made) are qualitative in nature. We have not provided exhaustive information here, instead we have attempted to provide the reader with a general understanding of the analytical framework Standard & Poor's uses in rating indemnified nat-cat bonds. These criteria represent the specific application of fundamental principles that define credit risk and ratings opinions. Their use is determined by issuer- or issue-specific facts, as well as by Standard & Poor's assessment of the credit and, if applicable, structural risks for a given issuer or issue rating. Methodology and assumptions change from time to time as a result of market and economic conditions, issue- or issuer-specific factors, or new empirical evidence that would affect our credit judgment.