

### ABOUT

This case study shows how Moody's loss predictive risk signals can help surety underwriters identify claim risk, improve risk selection, and support profitable growth.

### FIND OUT MORE

To learn more about Moody's surety solutions, please contact the team listed below.

### CONTACTS

Graham Tibbets, FCAS, MAAA  
Product Strategy  
Casualty and Financial Lines  
[Graham.Tibbets@Moody's.com](mailto:Graham.Tibbets@Moody's.com)

Justin Whitehouse, PhD  
Product Management  
Casualty and Financial Lines  
[Justin.Whitehouse@Moody's.com](mailto:Justin.Whitehouse@Moody's.com)

## Moody's loss predictive risk signals identify claim risk in surety underwriting

**A case study with a US specialty insurer shows how Moody's loss predictive risk signals can help support risk selection, portfolio steering, and more profitable growth.**

### EXECUTIVE SUMMARY

Surety underwriters need better ways to distinguish stronger and weaker risks, especially in portfolios where principal-specific information may be incomplete. In this case study, Moody's worked with a US specialty insurer to analyze North American surety bonds and assess whether Moody's loss predictive risk signals could help identify claim risk more effectively. The results showed that credit risk signals alone provided limited underwriting value but in combination with Moody's broader company data can deliver a surety claim risk score that strongly correlates with loss ratio performance.

#### Key takeaways:

- The analysis covered insurer performance in Q4 2025.
- Using probability of default (PD) reduced the loss ratio by 13 percent.
- Using the broader claim risk score reduced the loss ratio by 54 percent.
- Just under half of bonds used principal-specific PDs, with the remainder based on peer benchmarks.

## WHAT THE ANALYSIS FOUND

During Q4 2025, Moody's partnered with a US specialty insurer to analyze its North American surety bonds and identify loss predictive risk signals from Moody's Analytics credit and company risk data. To quantify the underwriting value of these risk signals, we back-tested against a set of historic policies and claims data.

The analysis revealed that by identifying and removing the riskiest 10% of principals by principal-specific probability of default (PD), the loss ratio for these principals only was reduced proportionally by 13%; however, when taken together with the losses from the remaining portion of the portfolio where no principal-specific PD was available, the impact was negligible.

Using a claim risk score informed by a broader range of signals covering credit risk and company firmographics to remove the riskiest 10% of principals from the entire book resulted in a loss ratio reduction of 54% — a significantly greater reduction than by using PD alone.

The value for the insurer is clear: Using the surety claim risk score at the point of underwriting can help them get a clearer view of risk and support profitable business growth.

### **1. Principal-specific risk metrics are crucial.**

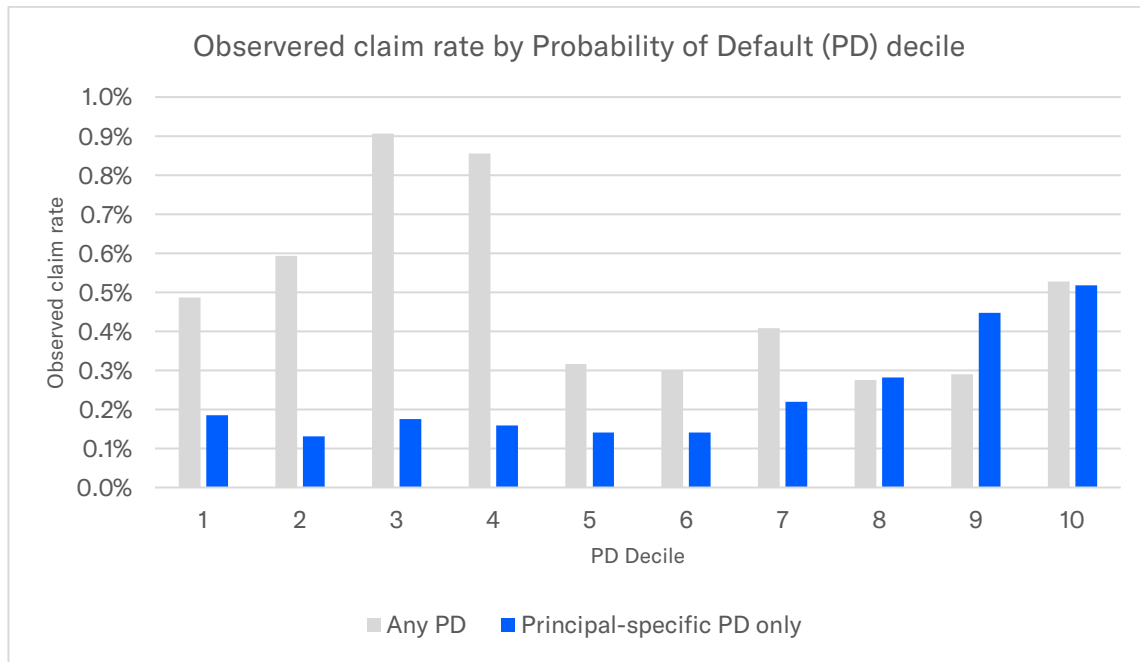
The book of business is comprised of a material fraction of small and mid-market principals in the United States, for which principal-specific data can be difficult to come by. PDs for these principals are generated by the Moody's EDF-X payment model powered by Moody's Pulse payment data.

Using this data, principal-specific PDs were calculated for just under half of the bonds. For the remaining bonds where payment data was not available, peer benchmark PDs were used. As demonstrated in Figure 1, analysis showed that peer benchmarks do not give sufficient differentiation between risks, underscoring the value of granular principal-specific data.

However, the absence of principal-specific PDs is itself an indicator of claim risk. The observed claim rate for bonds with principal-specific PDs was 0.3%. For those without, the claim rate was over twice as large at 0.7%.

For principals for whom payment and PD data are available, we find a clear relationship between credit risk and claim risk. Bucketing the policies by credit risk (PD) and measuring the associated claim risk of the buckets shows that principals with greater PD are more likely to have a claim.

**FIGURE 1**



Note: In the upper decile buckets, increasing payment model PD correlates with increasing observed claim rate. Bonds with no payment model PD are assessed using a peer group benchmark. These bonds contribute to higher claim rates, but peer performance is not representative of individual risks.

## 2. The modeled claim risk score gives greater coverage and differentiation.

Principal-specific PDs were only available for bonds where sufficient underlying principal-specific data exists, which was less than half of the portfolio. So what can an underwriter use in the absence of this data? This is a common problem for insurers writing business with small and mid-market principals.

By calibrating a surety claim risk model based on the insurer’s historic claims experience and drawing on a wider range of risk signals covering credit and company firmographic data, we were able to assign a claim risk score for all principals identified, regardless of how much principal-specific data was available.

With this claim risk model we again measured the impact on loss ratio by rejecting the top decile of bonds by claim risk score. Figure 2 exhibits the striking impact on loss ratio: It was reduced by 54%, compared with a reduction of 13%<sup>1</sup> from using the payment model PD alone.

By drawing on a range of credit and firmographic risk factors — not just PD — and by accounting for the lack of available risk data, the claim risk model is able to much more consistently identify bonds with elevated claim risk than the PD metric alone.

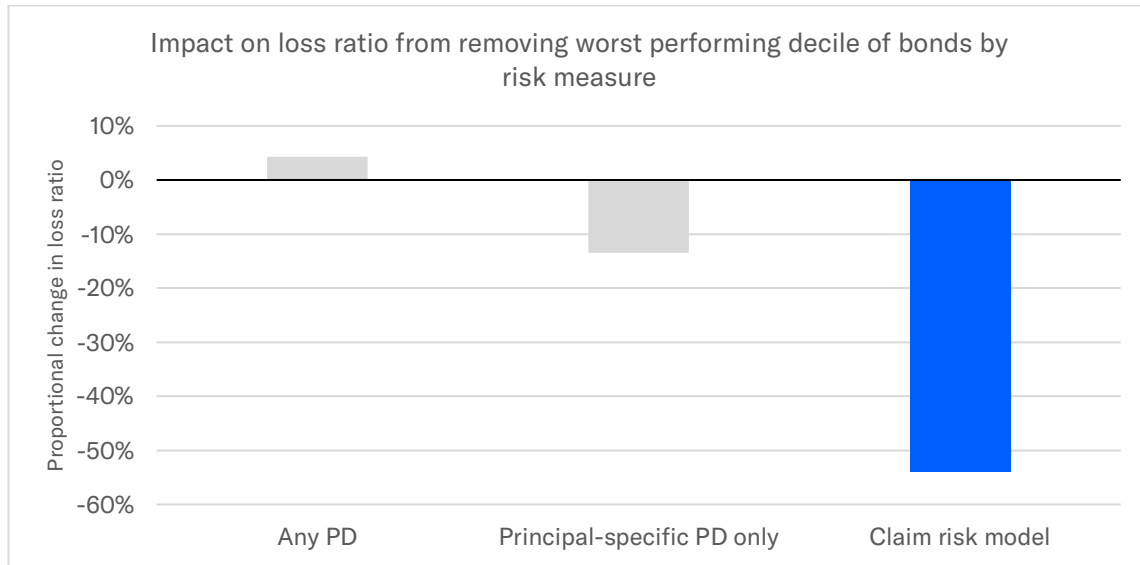
# 54%

proportional reduction in loss ratio by removing the worst 10% of bonds

<sup>1</sup> Loss ratio measured against only the portion of the business where principal-specific PDs were available

This is particularly relevant where underwriters need a fuller view of risk, even when company-specific payment data is limited.

**FIGURE 2**

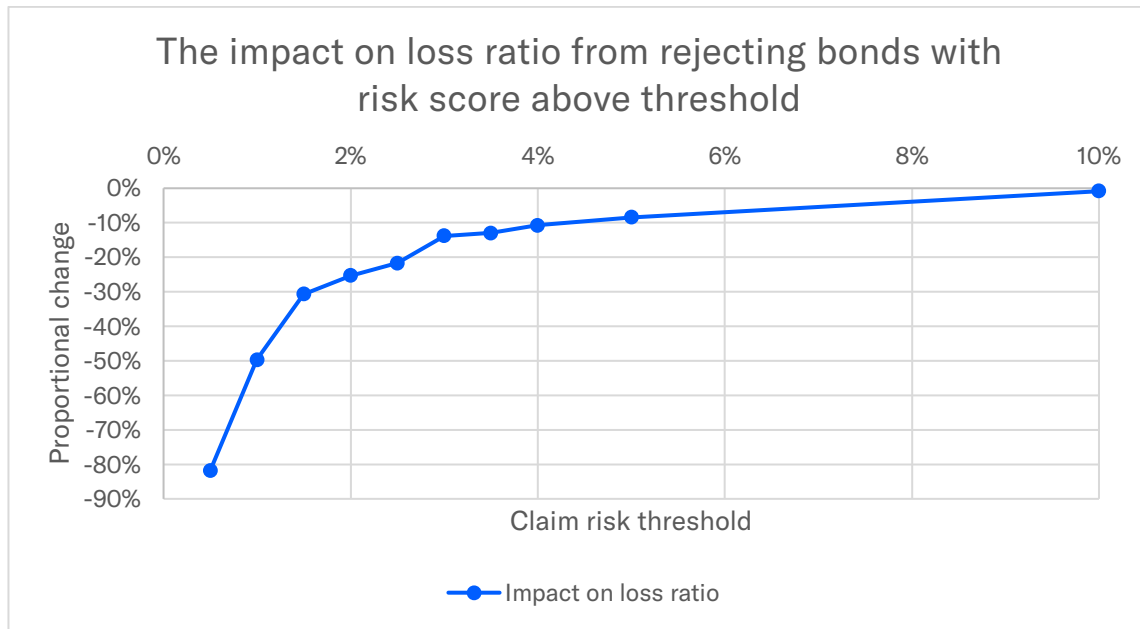


Note: The impact on loss ratio from the removal of the worst-performing decile of bonds varies significantly by risk measure used. The claim risk model is the most effective measure of claim risk with a proportional reduction in loss ratio of 54%.

### What this means for underwriters

Insurers can use the claim risk score in their risk selection process. They can set an accept or reject threshold on the score based on their own risk appetite, helping underwriters consistently and efficiently bind the most attractive risks aligned with their business objectives.

**FIGURE 3**



Note: The claim risk threshold is chosen according to the insurer’s risk appetite, which is reflected in the impact on loss ratio.

The choice of rejection threshold using the claim risk model can also have a big impact on the loss ratio, as shown in Figure 3. Insurers can take different approaches based on their risk appetite: If they want to take on more business with greater risk, they can reject at a higher claim risk threshold, and vice versa.

There is also a potential opportunity benefit: By being able to reject bonds above a certain level, insurers free up capacity for bonds that measure up more favorably..

**Why predictive risk signals matter in today’s competitive surety market**

Principal-specific loss-predictive risk signals from Moody’s provide a consistent indicator of claim risk in the North American surety bond market.

Underwriters can leverage this capability to better select surety risks and sustain profitable growth. Better signals do not need to transform every decision to deliver value. In many portfolios, like the portfolio in this study, a relatively small percentage of bonds drive a disproportionate share of losses.

By calibrating a risk score built on Moody’s credit risk metrics specifically to their surety bond portfolio, carriers can bend the curve by getting an enhanced view of the claim risk underlying the bonds they write. This analysis shows that declining a small portion of bonds associated with the highest risk signals can materially improve outcomes. Loss performance improves. Claims decline. Portfolio volatility is reduced.

This can be achieved without broadly restricting underwriting activity or dampening growth. Underwriting discipline is tied directly to financial outcomes, reinforcing that better decisioning is about refinement, not retrenchment.

© 2025 Moody's Corporation, Moody's Investors Service, Inc., Moody's Analytics, Inc. and/or their licensors and affiliates (collectively, "MOODY'S"). All rights reserved.

**CREDIT RATINGS ISSUED BY MOODY'S CREDIT RATINGS AFFILIATES ARE THEIR CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES, AND MATERIALS, PRODUCTS, SERVICES AND INFORMATION PUBLISHED OR OTHERWISE MADE AVAILABLE BY MOODY'S (COLLECTIVELY, "MATERIALS") MAY INCLUDE SUCH CURRENT OPINIONS. MOODY'S DEFINES CREDIT RISK AS THE RISK THAT AN ENTITY MAY NOT MEET ITS CONTRACTUAL FINANCIAL OBLIGATIONS AS THEY COME DUE AND ANY ESTIMATED FINANCIAL LOSS IN THE EVENT OF DEFAULT OR IMPAIRMENT. SEE APPLICABLE MOODY'S RATING SYMBOLS AND DEFINITIONS PUBLICATION FOR INFORMATION ON THE TYPES OF CONTRACTUAL FINANCIAL OBLIGATIONS ADDRESSED BY MOODY'S CREDIT RATINGS. CREDIT RATINGS DO NOT ADDRESS ANY OTHER RISK, INCLUDING BUT NOT LIMITED TO: LIQUIDITY RISK, MARKET VALUE RISK, OR PRICE VOLATILITY. CREDIT RATINGS, NON-CREDIT ASSESSMENTS ("ASSESSMENTS"), AND OTHER OPINIONS INCLUDED IN MOODY'S MATERIALS ARE NOT STATEMENTS OF CURRENT OR HISTORICAL FACT. MOODY'S MATERIALS MAY ALSO INCLUDE QUANTITATIVE MODEL-BASED ESTIMATES OF CREDIT RISK AND RELATED OPINIONS OR COMMENTARY PUBLISHED BY MOODY'S ANALYTICS, INC. AND/OR ITS AFFILIATES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS DO NOT CONSTITUTE OR PROVIDE INVESTMENT OR FINANCIAL ADVICE, AND MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS ARE NOT AND DO NOT PROVIDE RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS DO NOT COMMENT ON THE SUITABILITY OF AN INVESTMENT FOR ANY PARTICULAR INVESTOR. MOODY'S ISSUES ITS CREDIT RATINGS, ASSESSMENTS AND OTHER OPINIONS AND PUBLISHES OR OTHERWISE MAKES AVAILABLE ITS MATERIALS WITH THE EXPECTATION AND UNDERSTANDING THAT EACH INVESTOR WILL, WITH DUE CARE, MAKE ITS OWN STUDY AND EVALUATION OF EACH SECURITY THAT IS UNDER CONSIDERATION FOR PURCHASE, HOLDING, OR SALE.**

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS, AND MATERIALS ARE NOT INTENDED FOR USE BY RETAIL INVESTORS AND IT WOULD BE RECKLESS AND INAPPROPRIATE FOR RETAIL INVESTORS TO USE MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS OR MATERIALS WHEN MAKING AN INVESTMENT DECISION. IF IN DOUBT YOU SHOULD CONTACT YOUR FINANCIAL OR OTHER PROFESSIONAL ADVISER.

ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY LAW, INCLUDING BUT NOT LIMITED TO, COPYRIGHT LAW, AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT. FOR CLARITY, NO INFORMATION CONTAINED HEREIN MAY BE USED TO DEVELOP, IMPROVE, TRAIN OR RETRAIN ANY SOFTWARE PROGRAM OR DATABASE, INCLUDING, BUT NOT LIMITED TO, FOR ANY ARTIFICIAL INTELLIGENCE, MACHINE LEARNING OR NATURAL LANGUAGE PROCESSING SOFTWARE, ALGORITHM, METHODOLOGY AND/OR MODEL.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS ARE NOT INTENDED FOR USE BY ANY PERSON AS A BENCHMARK AS THAT TERM IS DEFINED FOR REGULATORY PURPOSES AND MUST NOT BE USED IN ANY WAY THAT COULD RESULT IN THEM BEING CONSIDERED A BENCHMARK.

All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, all information contained herein is provided "AS IS" without warranty of any kind. MOODY'S adopts all necessary measures so that the information it uses in assigning a credit rating is of sufficient quality and from sources MOODY'S considers to be reliable including, when appropriate, independent third-party sources. However, MOODY'S is not an auditor and cannot in every instance independently verify or validate information received in the credit rating process or in preparing its Materials.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability to any person or entity for any indirect, special, consequential, or incidental losses or damages whatsoever arising from or in connection with the information contained herein or the use of or inability to use any such information, even if MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers is advised in advance of the possibility of such losses or damages, including but not limited to: (a) any loss of present or prospective profits or (b) any loss or damage arising where the relevant financial instrument is not the subject of a particular credit rating assigned by MOODY'S.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability for any direct or compensatory losses or damages caused to any person or entity, including but not limited to by any negligence (but excluding fraud, willful misconduct or any other type of liability that, for the avoidance of doubt, by law cannot be excluded) on the part of, or any contingency within or beyond the control of, MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers, arising from or in connection with the information contained herein or the use of or inability to use any such information.

NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY CREDIT RATING, ASSESSMENT, OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.

Moody's Investors Service, Inc., a wholly-owned credit rating agency subsidiary of Moody's Corporation ("MCO"), hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by Moody's Investors Service, Inc. have, prior to assignment of any credit rating, agreed to pay Moody's Investors Service, Inc. for credit ratings opinions and services rendered by it. MCO and all MCO entities that issue ratings under the "Moody's Ratings" brand name ("Moody's Ratings"), also maintain policies and procedures to address the independence of Moody's Ratings' credit ratings and credit rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold credit ratings from Moody's Investors Service, Inc. and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually at [ir.moody.com](http://ir.moody.com) under the heading "Investor Relations — Corporate Governance — Charter and Governance Documents - Director and Shareholder Affiliation Policy."

Moody's SF Japan K.K., Moody's Local AR Agente de Calificación de Riesgo S.A., Moody's Local BR Agência de Classificação de Risco LTDA, Moody's Local MX S.A. de C.V., I.C.V., Moody's Local PE Clasificadora de Riesgo S.A., and Moody's Local PA Clasificadora de Riesgo S.A. (collectively, the "Moody's Non-NRSRO CRAs") are all indirectly wholly-owned credit rating agency subsidiaries of MCO. None of the Moody's Non-NRSRO CRAs is a Nationally Recognized Statistical Rating Organization.

Additional terms for Australia only: Any publication into Australia of this document is pursuant to the Australian Financial Services License of MOODY'S affiliate, Moody's Investors Service Pty Limited ABN 61 003 399 657AFSL 336969 and/or Moody's Analytics Australia Pty Ltd ABN 94 105 136 972 AFSL 383569 (as applicable). This document is intended to be provided only to "wholesale clients" within the meaning of section 761G of the Corporations Act 2001. By continuing to access this document from within Australia, you represent to MOODY'S that you are, or are accessing the document as a representative of, a "wholesale client" and that neither you nor the entity you represent will directly or indirectly disseminate this document or its contents to "retail clients" within the meaning of section 761G of the Corporations Act 2001. MOODY'S credit rating is an opinion as to the creditworthiness of a debt obligation of the issuer, not on the equity securities of the issuer or any form of security that is available to retail investors.

Additional terms for India only: Moody's credit ratings, Assessments, other opinions and Materials are not intended to be and shall not be relied upon or used by any users located in India in relation to securities listed or proposed to be listed on Indian stock exchanges.

Additional terms with respect to Second Party Opinions and Net Zero Assessments (as defined in Moody's Ratings Rating Symbols and Definitions): Please note that neither a Second Party Opinion ("SPO") nor a Net Zero Assessment ("NZA") is a "credit rating". The issuance of SPOs and NZAs is not a regulated activity in many jurisdictions, including Singapore. JAPAN: In Japan, development and provision of SPOs and NZAs fall under the category of "Ancillary Businesses", not "Credit Rating Business", and are not subject to the regulations applicable to "Credit Rating Business" under the Financial Instruments and Exchange Act of Japan and its relevant regulation. PRC: Any SPO: (1) does not constitute a PRC Green Bond Assessment as defined under any relevant PRC laws or regulations; (2) cannot be included in any registration statement, offering circular, prospectus or any other documents submitted to the PRC regulatory authorities or otherwise used to satisfy any PRC regulatory disclosure requirement; and (3) cannot be used within the PRC for any regulatory purpose or for any other purpose which is not permitted under relevant PRC laws or regulations. For the purposes of this disclaimer, "PRC" refers to the mainland of the People's Republic of China, excluding Hong Kong, Macau and Taiwan.