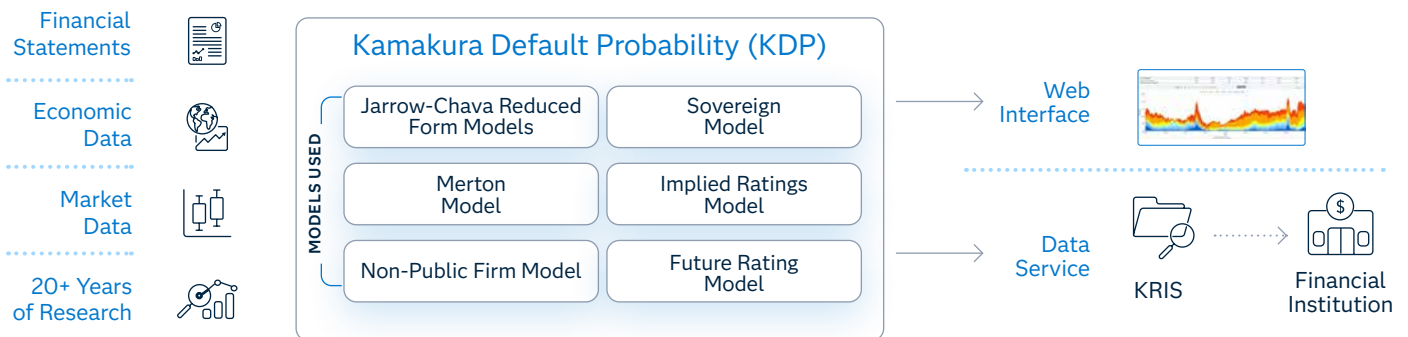


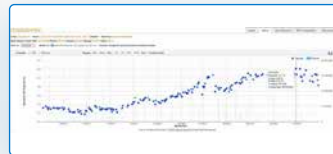
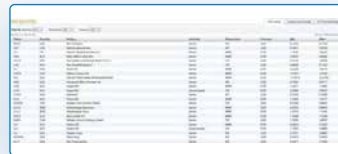
State and county treasurers share investment and risk challenges with financial professionals over a broad range of industries, including banks, hedge funds, pension funds and asset management – specifically cash management, financial accounting and valuation. Treasurers manage money market and fixed income portfolios and repo activities; administer derivatives contracts; manage project financing; and meet auditor, regulatory and statutory requirements. This means accurate assessments of credit risk are indispensable.

Public company default probabilities incorporate macroeconomic, market and financial data. KRIS offers full-term structures of default probabilities. Each public company has a unique set of coefficients that reflect its financial history and market conditions.

KRIS includes models for probability of default (KDP), implied and future-implied ratings, and implied CDS prices, along with fixed-income analytics and credit portfolio management capabilities. Additional models cover sovereign debt and US Banks.

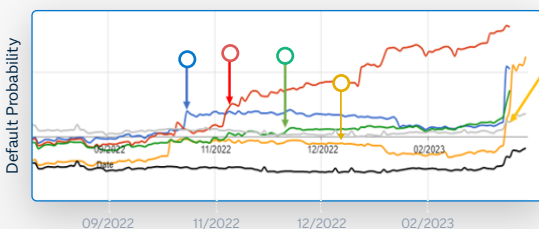


Used by treasurers, fixed-income investors, financial regulators, central banks and hedge funds



- Full-term structures of default probabilities** on 41,000 public companies allow for matched-maturity bond and derivatives pricing.
- Full disclosure of default probabilities** underlying factor weights and values.
- Daily US bond trades** were analyzed using derived links between bond spreads and issuer default probabilities.
- Daily default probabilities** are re-estimated based on updated data. Period-to-period changes are monitored and displayed.
- Future implied ratings** offer distributions of the likelihood of futures ratings, including probabilities of upgrade to investment and downgrade to speculative grades.
- Implied ratings distributions** are statistically derived from actual rating histories.

Early warning of the recent crisis



Institution Name	1-yr KDP over 90th Percentile	1-yr KDP > 5-yr KDP
● SIVB: Silicon Valley Bank Financial Group	October 21, 2022	October 21, 2022
● SI: Silvergate Capital Corp.	November 7, 2022	January 5, 2023
● FRC: First Republic Bank	March 9, 2023	March 9, 2023
● SBNY: Signature Bank	December 6, 2022	March 10, 2023

Lessons learned from an emergency

- Ratings are not credit forecasts**
Rating downgrades generally follow events rather than precede them. The best practice applies multiple default probability models, employing statistical procedures to validate and weigh multiple factors.
- The shape of default probability term structures is significant**
Every public company has a term structure of PDs. When a curve inverts, often months in advance, it usually signals trouble.
- Integrate and optimize**
More is better! Models exhibit varying sensitivities. Using multiple models in risk decision operations offers better coverage and reduces false positives.

For more information on SAS Kamakura Risk Information Services (KRIS), please visit:
Risk Management Software, Enterprise Risk Management | SAS