



Improving Model Risk Management at Investment Advisers



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Improving Model Risk Management at Investment Advisers

Using models can significantly enhance results and improve efficiency, but doing so also presents risks. Promontory helps firms control these risks and reduce or eliminate faulty reporting and decision-making through stronger model risk management.

Investment advisers use models in various aspects of their business and operations, including quantitative investing and portfolio management, risk management, and reporting. As the use of proprietary and third-party models becomes increasingly commonplace, asset managers should intensify their focus on a robust approach to model risk management.

From the perspective of investment management, model risk is a risk multiplier, potentially undermining risk and compliance programs that rely on model output. Insufficient control over model risk creates vulnerabilities that may result in legal and regulatory exposure, reputational harm, and monetary loss.

For example, in 2011, the Securities and Exchange Commission brought an enforcement action in connection with a model error and the manner in which the firm handled that error. This action has raised the profile of model risk management at investment advisers, as they have come to understand the significant potential for both financial and regulatory exposure posed by uncontrolled model risk for most firms.

Indeed, model risk has joined the ranks of more traditional risk categories facing asset managers, such as investment and operational risks. Therefore, whether models are developed internally or procured from third-party providers, firms should take steps to ensure the integrity of their models through a risk management framework.

How Promontory Can Help

Promontory can help ensure your firm's model risk management framework and processes effectively control model risk and meet the rising expectations of investors, senior management, regulators, and other stakeholders. Specifically, with respect to model development, implementation, validation, and use, we can assess the:

- Roles and responsibilities of those involved
- Effectiveness of controls, including policies, procedures, and training
- Quality of documentation standards
- Integrity of the error and incident escalation and governance processes

Our quantitative analysts and regulatory professionals regularly work with clients to:

- Create or evaluate model risk management frameworks, including policies, procedures, practices, and other controls
- Validate internal or vendor models in a way that is fully consistent with current sound practice and relevant regulatory guidance
- Perform critical independent review of internal model validation functions
- Provide benchmarks for comparison
- Develop models in a manner that facilitates model risk management and validation

In addition, Promontory's experts can help your firm understand the impact of model use and model risk management on your regulatory, compliance, and legal exposure. Relevant federal securities laws may include those related to fiduciary duties, disclosure obligations, and even antifraud provisions, with proposed anti-money-laundering requirements for registered investment advisers soon to join the list. We can help you understand how model risk, if not properly managed, can trigger these provisions. Promontory can also help you draft necessary and appropriate disclosures to help mitigate certain risks posed by model use and help investors understand the risk posed by models.

Beyond developing an appropriate framework and related processes for model risk management, Promontory can deploy resources to help you implement that framework and transfer knowledge to your employees to ensure an effective and sustainable program. Promontory has the resources and experience necessary to build a model risk management group from scratch, and to perform model validation on an outsourced basis, while training your employees to perform this function going forward. We can also assess your validation practices and provide a third-party expert opinion, including strengths and recommended enhancements to address any identified issues.

Why Promontory?

Promontory is uniquely suited to help securities-regulated entities enhance risk management around the use of models and quantitative techniques. Our team includes former senior officers and examiners from the SEC, Financial Industry Regulatory Authority, Office of the Comptroller of the Currency, and Federal Reserve; and experts in model governance, validation, and development from leading financial institutions. The team offers extensive knowledge and experience of appropriate management and oversight of model development, approval, validation, and use.

We also understand how model risk translates to familiar concepts under federal securities laws, from disclosure obligations to fiduciary and sales considerations. Adapting concepts employed at other financial services firms, Promontory can help investment advisers tailor a model risk management program that makes sense for their unique business and operations.

Promontory staffs engagements with a team of senior professionals and experts in financial economics possessing quantitative skills; governance expertise; and regulatory, compliance, and operational knowledge of securities. By inverting the staffing pyramid typical of other consultancies, we place our experts where they are needed most — fulfilling client needs.

WE BRING FOUR PRIMARY ADVANTAGES TO OUR WORK:

Promontory has experience advising large financial firms on all aspects of model risk management.

We have worked on model risk management issues with senior leaders and their staff at many different types of financial institutions, including leading banks, asset managers, nonbank lenders, insurance companies, credit rating agencies, central counterparties, and government-sponsored enterprises. We have helped our clients identify, measure, monitor, report, and mitigate model risk by enhancing their model risk management programs.

Promontory combines securities-related regulatory expertise with experienced quantitative talent.

We bring together these two skill sets in one integrated team so you know you are receiving advice from those who understand your industry — and the expectations of the SEC — and those with superior technical knowledge, skill, and hands-on

experience. Team members regularly conduct ongoing advisory engagements and training sessions for clients, publish research, and present to industry workshops and conferences on topics related to model risk and regulatory compliance.

Promontory understands each client's specific needs.

Our risk-sensitive approach to model risk management optimizes resource allocation and generates tailored solutions according to clients' objectives, risk tolerance, and regulatory environment. Our extensive work in model risk framework development and implementation, model development, model validation, and model risk regulation — as well as experience at the SEC and working for SEC-regulated entities — gives us the perspective and ability to offer a fully customized suite of model risk management services. We have observed and developed many different approaches to model risk management, carefully considering what makes sense for each client in light of the levels of financial, operational, regulatory, and compliance risk the use of models and modeling techniques presents.

Promontory possesses intimate knowledge of model risk management and regulatory expectations, both as written and as implemented in practice.

Our team includes former senior regulators who were closely involved in the development of current model risk management standards for the U.S. regulatory agencies (including SR 11-7/OCC 2011-12), and who helped implement those standards within the U.S. financial system. Team members have also designed and built model risk functions within institutions not subject to model risk supervision.

About Promontory

Promontory excels at helping companies resolve critical issues, particularly those with a regulatory dimension. Promontory professionals have unparalleled regulatory credibility and insight, and we provide our clients with frank, proactive advice informed by best practices and regulatory expectations.

Quantitative Services Group

Promontory's quantitative services group has decades of experience with leading financial institutions. Our past engagements include work for investment advisers and other asset managers, banks, insurance companies, credit rating agencies, regulators, and others. We are regularly called upon to review and assess models and model risk management practices using our deep knowledge of regulatory expectations, industry practices, and sound risk management. Our quantitative services group can develop and implement models for clients, validate models developed or used by clients, and provide advice on the full range of applications of analytics to business decision-making and risk management.

Many team members have been instrumental in developing regulations with which we help our clients comply, so our subject-matter expertise is second to none. Given Promontory's depth of talent drawn from the executive level of both financial and regulatory institutions, we view quantitative risk management not only from the client's perspective, but also from that of their regulators and investors.

Securities Practice Group

In an increasingly complex marketplace and changing regulatory environment, it is essential for financial institutions to develop sophisticated practices and policies that allow for profitability and compliance amid shifting regulatory expectations. Promontory's securities professionals have decades of high-level regulatory experience, and offer exceptional perspective and concrete solutions on how to achieve compliance without sacrificing profitability. We are trusted advisers with a combination of regulatory and industry expertise that sets us apart from other firms. Our professionals have served as senior leaders in enforcement, examination, and policy at global securities and derivatives regulatory bodies; and two former SEC chairs advise the firm.

Our past engagements include work for leading international financial institutions and regulators. We are regularly called upon to conduct reviews and assessments in matters demanding expert judgment; boards of directors, senior corporate executives, and staff at government agencies rely upon our authoritative reports.

Promontory's securities practice group assists investment advisers and other asset management businesses in a time of unparalleled regulatory challenges, with matters related to governance, risk management, compliance, and strategic planning.

We endeavor in all engagements to understand our clients' businesses and the expectations of their regulators, and use this knowledge to help clients achieve business goals and manage regulatory risks.

Our Clients and Case Studies

Promontory helps financial institutions and corporations resolve regulatory challenges with solutions that satisfy operational and strategic priorities. We are accustomed to collaborating with law firms, consultancies, and technology firms to achieve superior results for our clients.

We have previously served:

- Investment advisers and investment companies
- Broker-dealers
- Fintech companies
- Asset management businesses within integrated financial institutions
- Public companies and their boards and committees
- Insurance companies and other insurance providers
- Hedge funds and private equity firms
- Pension funds and endowments
- Service providers to the asset management industry
- Self-regulatory organizations
- Futures commission merchants
- Central clearinghouses
- Credit rating agencies
- Exchanges
- Swap dealers and major swap participants

CASE STUDY 1:

Quantitative Investment Adviser

Pursuant to an SEC enforcement action, a quantitative investment adviser that experienced an error in one of the models used in its investment process was required to retain an independent compliance consultant to conduct a comprehensive review of its supervisory, compliance, and other policies and procedures to prevent and detect: breaches of fiduciary duty, breaches of its code of ethics, and violations of U.S. federal securities laws.

Description of Work:

Promontory conducted an initial comprehensive review and two annual reviews covering the adviser's compliance and risk programs. Our team reviewed the firm's model risk governance; disclosures about its quantitative investment approach; and approach to identifying, resolving, and documenting model errors. Specifically, we:

- Reviewed disclosures about the coding process to identify any weaknesses in that process, and made recommendations as to the appropriate disclosures relating to the coding of models to investors
- Reviewed reporting around errors or other issues that arise after changes to models go into production, and made recommendations regarding the inclusion of compliance personnel, policies, and procedures in that reporting process
- Reviewed the approach to documenting errors in models and the retention of versions of computer code that animate models, and made recommendations on how to document and retain changes that occur in code

Outcome:

Promontory delivered three reports containing detailed recommendations on how the client could enhance its compliance and risk program and help ensure that its employees meet their fiduciary obligations, comply with its code of ethics, and prevent violations of U.S. federal securities laws.

CASE STUDY 2:

Nationally Recognized Statistical Rating Organization

The client needed to evaluate, enhance, and document the model risk management framework to bring it into compliance with new SEC requirements.

Description of Work:

Promontory made key contributions to the development of a robust and compliant model risk management framework. Specifically, we:

- Interpreted new regulatory requirements and advised on the development of a model risk management framework that complied with those new requirements, while encompassing industry sound practices
- Developed policies and procedures that introduced risk-sensitive model governance throughout the model risk management framework, allowing the firm to greatly increase the efficiency of model risk management resource allocation while meeting regulatory expectations
- Developed an initial model risk tiering scorecard, led cross-functional seminars to finalize the scorecard design in line with the agency's own risk appetite, and led the calibration of the scorecard, thereby producing a risk-tiering process to support risk-sensitive model governance while creating transparency in risk tiering for both internal and external stakeholders
- Drafted a full suite of governance policies and detailed procedures, as well as templates for model development and model validation documentation, working collaboratively with risk management, business, analytical, and IT functions
- Worked with risk management and business representatives to establish a comprehensive model inventory, reflecting a more robust model definition

Additionally, after development of the enhanced model risk management framework, the client asked Promontory to perform and document validation activities for 519 models, spanning a wide variety of model types, business areas, and risk tiers, over a period of nine months.

Outcome:

Promontory helped the client develop a robust, compliant, and feasible model risk management framework with less disruption than the client initially anticipated. Promontory also validated the model backlog in a timely and cost-effective manner, allowing the agency to focus on establishing internal model risk capabilities to meet business-as-usual requirements, and to benefit from a library of robust validation examples.

CASE STUDY 3:

Large Nonbank Financial Company

In order to address supervisory concerns regarding the adequacy of model governance, the client needed to evaluate the firm's model risk management framework relative to supervisory expectations, identify any gaps, and draft a remediation plan.

Description of Work:

The firm viewed SR 11-7 as the most relevant guidance for purposes of this evaluation, and Promontory based its assessment on that guidance. Our review identified a number of potential gaps relative to supervisory expectations and leading industry practices. We helped the firm develop an action plan to address the identified gaps. Elements of the action plan included:

- Creation of an enterprisewide model development strategy
- Refinement of model risk roles and responsibilities, especially for first-line staff
- A program of compensating controls to address model limitations
- Enhanced reporting to key stakeholders on model performance issues and mitigating actions
- Development of business requirements for a technology solution for model risk management information
- Assessment of staffing needs under the enhanced model risk framework
- Design of training programs for staff and education sessions for the board of directors
- Clarification of internal audit's role with respect to model risk

Outcome:

The client was able to clearly demonstrate to its regulator substantial progress toward a more robust target state for model risk governance, with a concrete action plan that included target completion dates for key tasks.

CASE STUDY 4:

Major Financial Services Trade Association

As leading banks implemented the new regulatory guidance on model risk governance (Federal Reserve SR 11-7 and OCC Bulletin 2011-12), trade-association member banks wanted to better understand the range of industry practices and acquire insight into how their peers were addressing aspects of the new guidance.

Description of Work:

Promontory facilitated a series of forums with model risk management professionals from a wide range of banks operating in the U.S. that allowed those professionals to share current practices and challenges encountered with the new guidance.

- Based on industry perspectives gained during those discussions, Promontory drafted a white paper on model risk management practices and issues that the trade association provided to banking regulators
- Subsequently, we worked with the same group on a narrower subset of the identified challenges in model risk management, to identify and document points of commonality and divergence, frame a set of key questions, and develop a thoughtful discussion of those key questions
- On behalf of the trade association and its members, Promontory scheduled and convened meetings with U.S. banking regulators to provide an opportunity to share and discuss the industry group's views, and seek clarification and feedback from regulators

Outcome:

Member banks were able to benefit from their peers' experience and in some cases adopt new practices that enhanced model risk management programs. The coordinated approach to engaging regulators allowed members to present a combined view to the regulators on challenging aspects of supervisory expectations, and receive consistent feedback on some key issues.

CASE STUDY 5:

Major U.S. Clearing House

Due to increased regulatory scrutiny in the post-crisis environment, the chief risk officer needed to reassess the clearing house's enterprise risk management framework, including a comparison of its model risk management framework and practices to SR 11-7 and leading industry practices.

Description of Work:

Promontory undertook a comprehensive assessment of the bank's model risk and control framework and associated operations. The review focused on the following areas:

- The enterprise risk management framework and related model risk management governance, including policies, procedures, oversight committees, and monitoring and reporting standards
- The structure and functions of the clearing house's model risk activities
- The roles and responsibilities of model owners and users in the first line of defense and independent model risk management in the second line of defense
- The organizational structure and staffing of the first- and second-line functions

Outcome:

Promontory identified gaps in the clearing house's current practices, and developed tangible actions to redesign and enhance its model risk and control framework. We tailored recommendations so that model risk practices would both support the firm's business strategy, and effectively address heightened regulatory standards. The review identified opportunities for streamlining governance, reporting, and operational processes.

CASE STUDY 6:

U.S. Regional Bank

The bank had been undergoing significant organic growth, subjecting it to increased regulatory scrutiny. The chief executive officer and CRO needed to assess the bank's risk management framework for completeness and conformity with best practices and heightened regulatory expectations. As expectations for banks of its size were evolving, they wanted to incorporate a range of industry practices in the assessment.

Description of Work:

Promontory conducted a comprehensive assessment of the bank's risk management framework, including a focus on key areas of model risk governance.

- We evaluated the bank's model risk management framework against SR 11-7 and industry standard practices for banks of its size, and provided additional insights into practices at larger banks to address the bank's growth strategy
- Our team recommended revisions to the existing model risk management framework with a focus on enhancing policies and procedures and other components of model risk management governance
- Promontory continues to work with the bank, and has been engaged to conduct follow-up work to assess the effectiveness of the bank's implementation of its new model risk management framework

Outcome:

Promontory delivered key model governance documentation, including:

- A revised model risk management policy
- Six procedures related to model risk
- A draft scorecard for model risk ratings
- Model development and model validation templates

All deliverables reflected the bank's strong risk culture and provided a foundation for a robust model risk management framework.

CASE STUDY 7:

Government-Sponsored Enterprise

In response to recent regulatory feedback, the client sought to enhance the existing model risk management framework in several key areas of model risk management — ongoing monitoring, management of model assumptions and sensitivities, and user-acceptance testing — to incorporate leading industry practices and to better align with relevant supervisory guidance (FHFA AB 2013-07).

Description of Work:

Promontory reviewed policies, procedures and practices relative to industry standards and regulatory guidance and provided actionable insights. Specifically, we:

- Performed a gap analysis and made recommendations comparing client policies, procedures, and practices relative to industry standards and regulatory guidance
- Developed firmwide procedures to address in-scope activities
- Designed a remediation strategy and action plan to address the identified gaps

Outcome:

The client successfully implemented a Promontory-drafted action plan to align enterprise procedures and practices with supervisory expectations and industry standards.

Selected Biographies



MARK LEVONIAN

*Managing Director and Engagement Adviser;
Global Head For Enterprise Economics and Risk Analysis*

Mark assists clients with quantitative strategy and compliance matters, including risk quantification, model validation, stress testing, liquidity standards, and capital planning. Before joining Promontory, he was senior deputy comptroller for economics at the OCC, where he oversaw quantitative examination support and provided advice and policy direction for quantitative methods for risk management and other purposes. While at the OCC, Mark led the team that developed the 2011 Supervisory Guidance on Model Risk Management. He also led or participated in many Basel Committee or Joint Forum initiatives related to models, model governance, and model validation, and played a leading role in the subsequent development of U.S. rules and guidance in these areas.



CONWAY DODGE

Managing Director

Conway advises clients on securities-related regulatory, compliance, and enforcement issues, and has particular expertise in conducting compliance and risk assessments and internal investigations on behalf of corporations, boards of directors, and special committees. Before joining Promontory, he served for 12 years at the SEC, most recently as an assistant director in the Division of Enforcement, where he led complex investigations into potential violations of securities laws, often in collaboration with other federal, state, and foreign regulators. Conway has extensive experience with investigations involving whistleblowers, the Foreign Corrupt Practices Act, public company disclosures, internal controls, and financial fraud.



C. ERIK LARSON

Managing Director and Global Head For Quantitative Methodologies and Analytics

Erik provides clients with solutions in areas relating to quantitative risk management. He has vast experience in developing and validating the models used by financial institutions and regulators to measure and manage risk. Recently, Erik has been working with clients to develop quantitative assessments of systemic risk exposure through the use of stress testing, scenario analysis, and economic-capital modeling. He is also an expert in the design and application of risk scoring models in AML, credit, regulatory capital management, model validation, and governance. Prior to joining Promontory, Erik served as director

of economic capital for Fannie Mae, where he oversaw the measurement and allocation of capital requirements for a \$2.6 trillion book of business. He earlier served as senior financial economist and lead enterprise risk expert in the risk analysis division of the OCC, and contributed to several efforts to develop the proposed U.S. implementation of the Basel II regulatory capital reforms. At the OCC, Erik led the quantitative portions of several reviews of bank risk management practices; he also was a member of the interagency Basel II guidance development committee and helped to develop and teach curricula for examiner training in the Basel II advanced IRB (advanced internal rating-based approach) credit risk and advanced measurement approaches for operational risk. Erik has also analyzed and developed individual and corporate income tax policy in the office of tax analysis at the Department of the Treasury, has served as assistant professor of statistics on the faculty of the University of Southern California School of Business Administration, and has worked as a private consultant.



MICHAEL SULLIVAN

Managing Director

Mike specializes in corporate governance and securities-related regulatory, compliance, and enforcement issues for investment advisers, broker-dealers, credit rating agencies, self-regulatory organizations and exchanges, and other securities-regulated entities. He previously served as associate general counsel to the Public Company Accounting Oversight Board, where he advised board members and staff regarding applicable laws and regulations. As assistant vice president for market regulation at Nasdaq-Liffe Markets, Mike assisted with the design, implementation, and management of all aspects of the regulatory and compliance program for a new electronic-trading market. He has also served as an attorney in the office of the general counsel and division of enforcement at the SEC.



PAUL HUCK

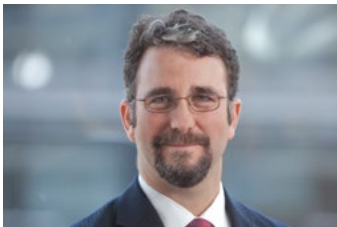
Director

Before joining Promontory, Paul spent nearly two decades as a supervisor and economist at the Federal Reserve Bank of Chicago. He founded and led the Chicago Fed's wholesale credit risk center, a national initiative to promote analytics-driven supervision of large banks' wholesale credit portfolios and contribute to the capital-plan assessments for the Federal Reserve's Comprehensive Capital Analysis and Review. Paul's past policy work includes serving as a senior economist for the Chicago Fed's financial markets group. In this role, he was responsible for improving and maintaining

institutional expertise on derivatives markets and participated in an interagency review of proposals for central clearing of credit-default swaps. He earlier served as a member of the interagency working group that developed supervisory expectations for U.S. implementation of the advanced internal ratings-based approach recommended in the Basel II agreement.

**LAURA MAGYAR***Director*

Before joining Promontory, Laura served as a branch chief in the SEC's Office of Compliance Inspections and Examinations, where she oversaw inspections of broker-dealers and investment advisers for compliance with SEC and FINRA rules and regulations. Her work there touched on many of the SEC's National Exam Program's priorities, including sales practices, best execution, Rule 15c3-5 (Market Access Rule), Regulation SHO, foreign-domiciled U.S.-registered broker-dealers, and anti-money-laundering compliance. Laura was also seconded to the Financial Conduct Authority in London, working in the Enforcement and Supervision Division. Prior to that, Laura spent several years practicing law in the private sector.

**NICHOLAS KIRITZ***Senior Principal*

Nick has served as a risk management executive for over 15 years, and has experience in several private, regulatory, and consulting organizations, including Constellation Energy, Exelon Corporation, Fannie Mae, the OCC, and McKinsey & Company. He has designed, built, and led functions for economic capital and model validation. Nick developed risk frameworks, including policies, controls, metrics, and models, and managed the portfolio market risk function at the two largest merchant power generators in North America. He brings considerable experience in board and senior-management reporting.

Contact Us

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Promontory Financial Group helps companies and governments around the world manage complex risks and meet their greatest regulatory challenges. We are the world's foremost experts in financial risk, regulation, and compliance. Former U.S. Comptroller of the Currency Eugene A. Ludwig founded Promontory in 2001.

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