



THE MODEL RISK PLAYBOOK

Essentials for Banks & Fintechs



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Why Model Risk Management Matters Now

A growing priority for financial institutions and fintech companies is model risk management, or MRM. Organizations are increasingly reliant on models to drive decisions in areas like credit, fraud, liquidity, and compliance.

As a result, the risks associated with inaccurate, outdated, or unvalidated models are more visible – and **more costly**. As regulatory expectations increase, so does the pressure to make sure models are more than compliant – they must also be **effective** and **well-governed**.

But how do you translate best practices into a true model risk management program?

Many institutions and fintechs use MRM to improve governance, increase transparency, and reduce risk across departments. Rather than managing models in silos, centralized MRM programs support better cross-departmental understanding of model governance expectations. This broader approach supports faster, more confident decision-making across the organization.

For those without a strong MRM framework in place, the risks are significant. Beyond regulatory scrutiny, organizations may face strategic missteps, misaligned assumptions, or reputational damage stemming from unmonitored or poorly performing models.

In this report, we'll walk through what defines a model and the key elements of an effective model risk management program. Then, we'll provide a real-world scenario for reference when you're building a scalable model risk strategy for your business.

Section 1

The Definition & History of Model Risk Management

The first – and often most misinterpreted – step in building an effective model risk management program is [understanding when a system qualifies as a model](#). Your organization may rely on complex systems to support key decisions, but not all of those systems should be treated (or tested) as models. It's important to define what constitutes a model, distinguish it from a tool, and recognize why that difference carries weight – both with risk and regulations.

What is a Model?

A quantitative method, system, or approach that applies statistical, economic, financial, or mathematical theories, techniques, and assumptions to process input data into quantitative estimates.

**As defined by SR11-7: Guidance on Model Risk Management*

Understanding what qualifies as a model is crucial. This informs how systems are managed – and validated – so you can meet regulatory expectations. While many assume any complex software is a model, it's important to understand the difference between a [model](#) and a [tool](#).



What is a Tool?

A computational process as opposed to a quantitative system. It applies simple arithmetic calculations not expected to produce ambiguous values, regardless of the complexity of the computation. A tool performs simple calculations, compiles financial information, and reports results, **but is not predictive in nature.**

Models specifically analyze data and generate outputs that influence key decisions. In contrast, **tools** typically perform basic functions, such as calculations or rule-based processing, and are often qualitative in nature. To clarify this distinction, below we present the core criteria used to identify a model.



Component Test

- ✓ Information input component that delivers assumptions and data to the model
- ✓ Processing component that turns inputs into estimates
- ✓ Reporting component which translates estimates into useful business information



Estimate Test

- ✓ Quantitative estimates
- ✓ Transforms inputs into outputs of a different type
- ✓ Apply statistical, economic, financial, behavioral or mathematical theories or techniques



Relationship Test

- ✓ A simplified representation of real-world relationships among observed characteristics, values, and events



Subjectivity Test

- ✓ Subjective judgment exercised at various stages of model development, implementation, use, and validation



Use Test

- ✓ Supports decision-making and provides predictive information in a number of business areas

When evaluating any system, if you are able to evaluate against the above criteria and say “yes, this system does this,” then you are working with a model. Models can take many forms, each designed to represent and analyze real-world scenarios in different ways. The categories below highlight how various types of models process information and support decision-making.

Categories of Models

Mathematical Models

- Represent systems or processes using mathematical equations or algorithms
- Used to predict system behavior or understand how it works

Machine Learning Models

- Use algorithms to learn from data and make predictions or decisions
- Applied in image recognition, speech recognition, NLP, predictive analytics

Statistical Models

- Use statistical techniques to represent or analyze data
- Make predictions or reveal patterns in data

Simulation Models

- Mimic behavior of real-world systems or processes
- Used to test system performance under varying conditions or to predict behavior

These models rely on data inputs and assumptions to produce results that inform decisions. But this process carries inherent risks – which is known as **model risk**. Errors or biases in these models can quickly lead to financial losses, poor business decisions, and reputational damage.

That’s why **model validation** is essential: it identifies and mitigates these risks by testing assumptions and monitoring performance. Regulators emphasize strong model risk management to ensure transparency, accuracy, and accountability when using these systems.

The Regulatory History of Model Risk Management: A Timeline

Model risk management became more at the forefront of conversations when the FDIC adopted the Supervisory Guidance in 2017 for banks with over a billion dollar in assets. All three major regulatory agencies have since adopted guidance on MRM, reflecting nearly 25 years of evolving thought and practice in this area.

Before the 2008 financial crisis, model risk management was mostly guided by industry best practices rather than formal regulations. However, the crisis exposed significant issues with model outputs used for regulatory capital, highlighting concerns about model complexity, inconsistency, and lack of transparency. Since then, regulators worldwide have strengthened oversight, emphasizing the need for robust MRM frameworks.



Section 2

Understanding the Model Risk Process

Regulatory expectations and internal governance standards require more than just periodic reviews – a structured, consistently applied framework is key. A strong model risk management strategy begins with a clearly defined policy and is supported by several key components.

Components of a Model Risk Management Strategy

- Model Risk Management Program
- Model Inventory
- Risk Assessment
- Validation
- Ongoing Monitoring

How Do You Validate a Model?

Model validation is arguably the most important step. Validation helps identify limitations, assess assumptions, and evaluate potential impacts, supporting the overall soundness and reliability of the model.

What is Model Validation?

A set of processes and activities intended to verify that the models are performing as expected and are in line with their design objectives and business uses.





Sample Validation Process

Once the purpose and scope of the validation are clear, the process moves through key steps. Each step supports a thorough evaluation of whether the model is functioning accurately, effectively, and as intended.

01

Define Validation Objectives

- Establish what the model is intended to do and determine the key outcomes or behaviors you're testing against.

02

Identify System Inputs

- Understand and document all systems and data sources that feed into the model for full visibility and traceability.

03

Testing

- Conduct independent re-performance or live testing outside the system to verify whether the model behaves as expected – not just data mapping.

04

Outcome Analysis

- Compare actual model outputs to expected results to confirm the model's logic is sound and aligned with defined objectives.

Industry Examples

Model validation varies across industries, reflecting different risks and regulatory requirements. Here's a look at common validation focuses for financial institutions and fintech companies.

Financial Institutions

For banks and credit unions, model validation is commonly applied to areas such as:

- **Allowance for Credit Loss (CECL) Models:** Validation checks the model's forecasting accuracy and the relevance of economic variables used to project future losses.
- **Bank Secrecy Act (BSA) & Anti-Money Laundering (AML) Models:** Detects suspicious transactions and supports regulatory compliance. Validation checks the effectiveness of detection logic, thresholds, segmentation, and overall risk coverage.
- **Credit Risk Models:** Used for loan underwriting or estimating probability of default. Validation checks that the model accurately reflects borrower behavior and risk exposure.
- **Interest Rate Risk (IRR) Models:** These assess the impact of rate changes on the balance sheet. Validation involves stress testing assumptions and reviewing scenario outcomes.
- **Liquidity Risk Models:** Validated for accuracy in projecting cash flow needs under different stress conditions.
- **Security Models:** Evaluates cybersecurity and data protection risks. Validation assesses model logic, key assumptions, and outputs to support threat detection and response planning.



Fintech Companies

For fintechs, especially those using advanced technology and data analytics, validations often focus on:

- **Machine Learning Models for Lending or Fraud Detection:** These require testing for bias, overfitting, and interpretability, as well as alignment with regulatory expectations.
- **Pricing Algorithms:** Validations confirm that pricing logic aligns with market conditions and doesn't introduce hidden risks.
- **Customer Risk Scoring Models:** Used for onboarding or compliance (i.e., KYC/AML), validation involves reviewing scoring methodology and regulatory alignment.

Across both sectors, the validation process plays a critical role in managing model risk and maintaining confidence in the decisions models are driving.



Section 3

Put Into Practice: How Wolf Guided Synctera Through Their Model Validation Process

Real-World Application

Model validation becomes especially important when fintechs and financial institutions collaborate. That's why Synctera, a BaaS platform, engaged Wolf & Company to validate AML and KYC models used by its fintech partners. The goal: provide assurance to financial institutions and align with regulatory expectations.

Challenge

Synctera needed assurance that its partners' AML models met regulatory expectations and wouldn't raise concerns during exams. They turned to Wolf to evaluate model effectiveness and controls.

Solution

Wolf worked with Synctera to understand the models' use, regulatory implications, and oversight needs. The team performed parallel analysis to verify results, reviewed controls, and offered guidance on documentation and governance to align with the standards for financial institutions.

Result

Wolf confirmed the accuracy of model outputs and delivered a validation report Synctera could share with financial partners. The engagement helped Synctera and its fintech clients demonstrate compliance and strengthen model oversight.

[Read the Full Case Study](#)

"Synctera is built with risk and compliance at its core. We needed an experienced risk and compliance partner that could help us with model reviews within a fintech environment. Wolf helped us achieve just that and remained flexible and communicative throughout the process."

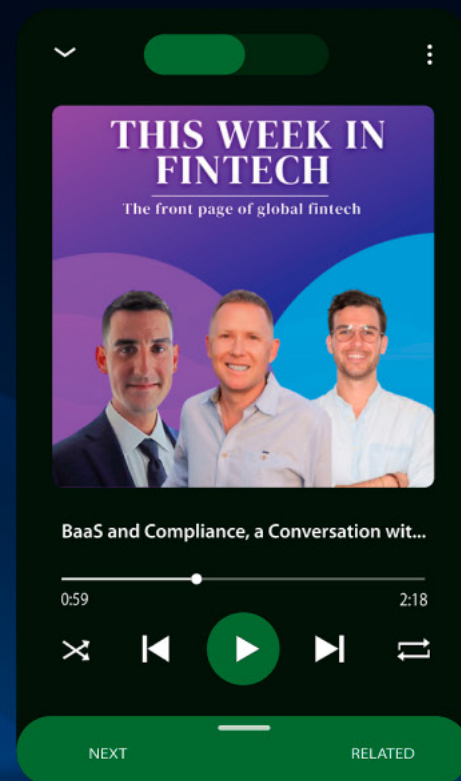
- Mitchell Lee, Former Chief Risk & Compliance Officer, Synctera

Hear It First-Hand: Synctera's POV On Partnering With Wolf & Company For Model Validation

Synctera CEO Peter Hazlehurst sat down with **This Week in Fintech** to talk about their experience working with Wolf & Company and how to build scalable, compliant bank-fintech partnerships. The conversation covered everything from using regulation as a growth strategy to the future of BaaS and what fintech founders should rethink going forward.

Listen to the full conversation for insights on the model risk management process – directly from the team behind the work.

[LISTEN NOW](#)



ABOUT WOLF & COMPANY

Wolf & Company is a national accounting and advisory firm that has been serving clients for over a century. With a deep understanding of the complex challenges facing financial institutions and fintechs, we deliver tailored audit, tax, risk management, and business advisory services designed to meet the demands of a rapidly evolving landscape.

Grounded in professionalism, dedication, and respect, our team combines technical expertise with a hands-on, relationship-driven approach. We work alongside our clients to navigate regulatory requirements, manage risk, and position their organizations for long-term success. Whether serving a community bank, a fast-growing fintech, or a hybrid organization bridging both, Wolf is trusted for guidance that's practical, proactive, and always aligned with our clients' strategic goals.

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