



# MATLAB for Risk Management

In rapidly changing regulatory and business environments, risk professionals must reduce model development times, and develop and implement applications that are transparent, consistent, and scalable.

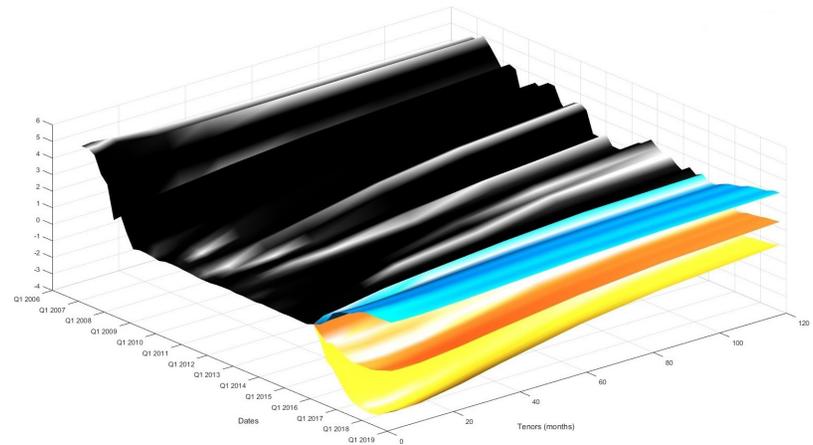
MATLAB® lets risk managers, analysts, and developers develop and test applications and perform extensive what-if scenarios supported by numerical accuracy and algorithm traceability as well as thorough reference documentation.



# 1 Prototyping, Modeling, and Analysis

MATLAB enables risk professionals to quickly develop a comprehensive range of risk models, including:

- Estimating and backtesting value at risk, conditional value at risk, and other key risk measures
- Building comprehensive financial risk management and stress-testing tools, servicing compliance, accounting, and stress-testing regimes
- Calculating credit and counterparty risk metrics, such as exposure, loss-given defaults, probability of default, loss distributions, and recovery
- Performing market risk, liquidity risk, operational risk, and systemic risk calculations
- Measuring risk in risk parity, “smart beta,” and other factor-based strategies
- Aggregating risks, ensuring reliable key risk indicators (KRIs)



*Stress testing: shocking the level, slope, and curvature of the yield curve.*

*“Risk calculations that would take an hour with a spreadsheet-based system are completed in a few minutes with MATLAB.”*

— Athanasios Bolmatis, Fulcrum Asset Management

*“MATLAB is not as complex to code in as C++ or as constrictive as Excel. MATLAB helps me sell ideas, through visuals that are easy to build.”*

— Attilio Meucci, SYMMYS

# 2 Application Development

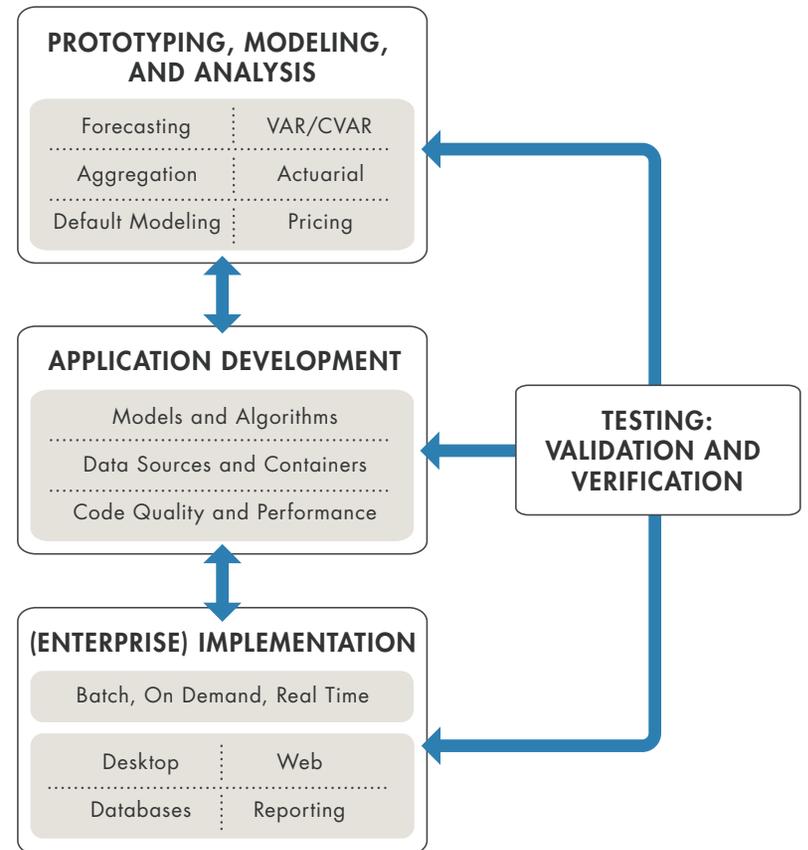
Research ideas are often expressed like concepts in a textbook, equation-fueled models that follow a procedural process. Taking these ideas expressed in code and incorporating them in a maintainable form that can be troubleshot, scaled, and improved is a key advantage of MATLAB. Risk modelers and application developers can research and develop in the same platform, facilitating collaboration and reducing risk by working in a single, quality-assured environment.

In risk systems, such capabilities are integral to the reputational risks of the organization. Since risk managers are rarely computer scientists, ensuring a smooth process from model and procedure to efficient software is essential.

MATLAB provides capabilities to help risk teams easily incorporate their models and analytics into development.

*“With object-oriented programming in MATLAB, we created a framework and components that are easily reused, even by analysts who are not expert programmers.”*

— Ariel Fischer, Trient Asset Management



Agile development and implementation of risk models with MATLAB.

# 3 Enterprise Implementation

MATLAB enables risk professionals to share a risk analytic or model from a single research stack to support many different deployment targets, while reducing the time required to take research applications into enterprise implementation.

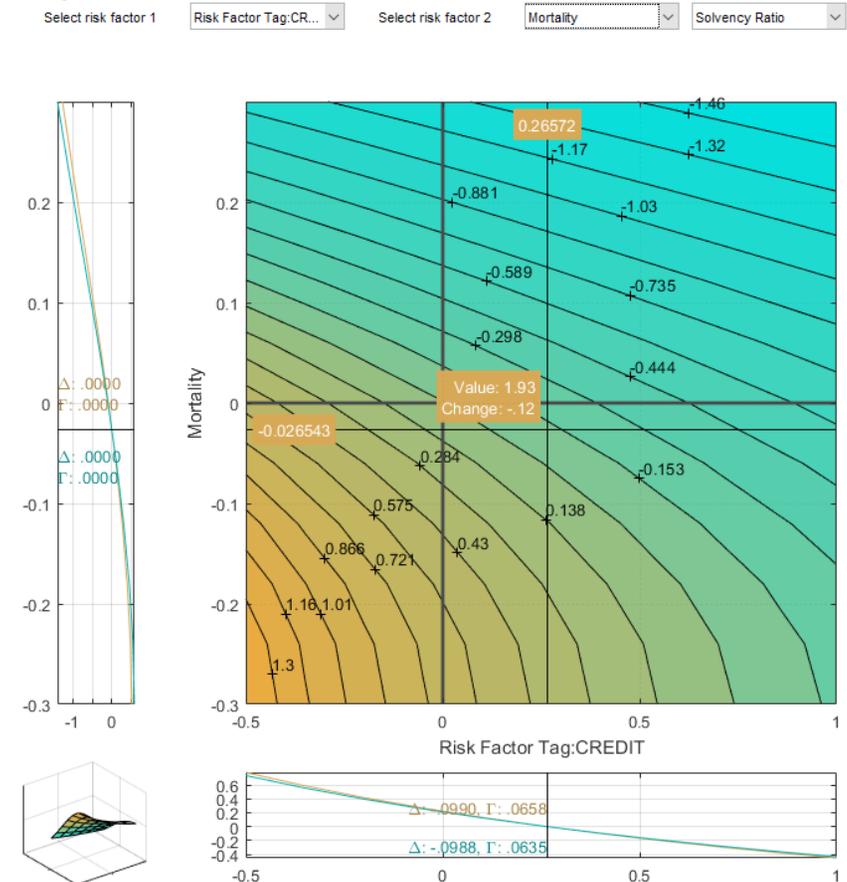
Examples include:

- Deploying a risk dashboard
- Deploying a MATLAB based Microsoft® Excel® add-in
- Building a web application and making it available to customers or customer-facing advisors
- Incorporating analytics into an enterprise visualization platform
- Embedding analytics alongside a database platform
- Generating interactive, production-ready reports automatically
- Incorporating models into third-party risk platforms

*"MATLAB enabled us to concentrate on our core competencies as investment professionals and deploy a quantitative risk management and portfolio optimization dashboard that has added value from day one across our team."*

— Mathew John and Jason Liddle, SMMI

Analysis



*Risk Explorer dashboard section from Model IT's commercial product cFrame, showing solvency capital ratio sensitivity to changes in credit spreads and mortality.*

# Learn More

*Ready for a deeper dive? Explore these resources to learn more about using MATLAB in your finance workflow.*

## ▶ Watch

[Munich Re Trading Creates a Risk Analytics Platform with MATLAB: Project Overview](#) 4:12

[Munich Re Trading Creates a Risk Analytics Platform with MATLAB: Demonstration](#) 3:31

[Building an Internal Risk System with MATLAB](#) 24:55

[Credit Portfolio Simulation with MATLAB](#) 25:44

## 🔍 Explore

[Exploring Risk Contagion Using Graph Theory and Markov Chains](#)

[Systematic Fraud Detection Through Automated Data Analytics in MATLAB](#)

[Developing and Implementing Scenario Analysis Models to Measure Operational Risk at Intesa Sanpaolo](#)

[ICICI Securities Develops Online Financial Planning and Advisory Platform](#)

[Model IT's cFrame](#)