

Industry Solution Sheet: Financial Services

Challenges and Capabilities

Mathematical optimization is a well-established, essential technological tool in the financial services industry. For over 50 years, mathematical optimization technologies have been used by leading companies across the financial services ecosystem (including institutional and consumer banks, wealth management firms, hedge funds, insurance providers, and fintech players) to:

- Address a wide variety of complex business problems including portfolio optimization, cash management, trade settlement, and asset liability management.
- Make optimal, data-driven decisions that deliver improved operational efficiency, profitability, and regulatory compliance as well as reduced risk and costs.

Indeed, mathematical optimization is a proven, pivotal, and pervasive technology in the financial services industry – but still, companies in this space are constantly discovering and unlocking new opportunities to:

- Enhance their use of mathematical optimization with a state-of-the-art solver, like the Gurobi Optimizer, which is capable of handling even the most challenging business problems with the utmost speed, robustness, and reliability.
- Expand their use of mathematical optimization to new business areas across financial services operations including systemic risk management, portfolio replication, credit swap management, fraud cost reduction, and countless others.

In recent years, we have seen a steady increase in the number of financial services companies using mathematical optimization, the number of different mathematical optimization applications developed and deployed by these companies, and the positive impact of mathematical optimization on these companies' operations and bottom lines.

The most successful financial services companies today rely on mathematical optimization technologies to help them efficiently manage their assets and

operations and make the best possible business decisions when it comes to questions like:

- How can we optimize the asset allocation of our portfolios to maximize risk-adjusted returns?
- How can we minimize the costs of managing our assets?
- How can we ensure regulatory compliance while minimizing risk?
- How can we maximize the utilization of our resources at the lowest cost?

With mathematical optimization technologies, financial services companies can answer these questions by automatically generating optimal solutions to their most complex business problems and then using those solutions to determine the best courses of action.

With mathematical optimization technologies, financial services companies can transform their operations and reach the highest levels of productivity, performance, and profitability.



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Opportunities for Optimization

Mathematical optimization is used by financial services companies today to optimize many different customer-facing and back-office functions. Here are some of the main applications of mathematical optimization in the financial services industry:



Asset Management

- Portfolio Optimization
 - Collateral Allocation
 - Portfolio Replication
 - Bond Management
 - Hedging Strategies
 - Debt Management
 - Credit Swap Management
- Trade Settlement
- Asset-Liability Management
- Payment Netting
- Systemic Risk Management



Operations Management

- Cash Management
- Collection Management
- Branch Network Optimization
- Fraud Cost Reduction
- Credit Card Offering Optimization
- Appointment and Field Service Scheduling



Business Benefits

With mathematical optimization technologies, financial services companies can tackle their complex business problems, optimize their decision making, and achieve their business goals by:

- Maximizing returns
- Boosting resource utilization and operational efficiency
- Improving regulatory compliance
- Reducing operating, transaction, and customer acquisition costs
- Increasing processing speed
- Improving customer service
- Maximizing profitability

Example Customers

Here is a selection of Gurobi customers from the financial services industry that use mathematical optimization to revolutionize their operations and realize tremendous business benefits:

