

# Generating Optimal Fixed-Income Portfolios

The Gurobi solver directly impacts the performance of Robeco's EUR 12.5+ billion in assets under management.

## ROBECO

The Investment Engineers

Robeco aims to enable its clients to achieve their financial and sustainability goals by providing superior investment returns and solutions. Since 1997, Robeco Institutional Asset Management US, Inc. has offered institutional investors in the US and Canada research-driven fundamental and quantitative investment capabilities based on global and emerging market equity and fixed income strategies.

**Industry:** Financial Services

**Location:** Europe

**Use Cases:** Portfolio Management

**Website:** [www.robeco.com](http://www.robeco.com)

### Results

- Efficiently and effectively creating optimal fixed-income portfolios
- Delivering the best possible returns for clients

**“ The Gurobi solver directly impacts the performance of more than €12.5 billion in assets under management—and this underlines the importance of selecting the best mathematical optimization solving engine.”**

**Mathieu van Roon**

*Portfolio Manager, Robeco*

The success of an asset management firm rests – in large part – on the strength of its investment portfolios. In order to design and deliver robust portfolios that consistently produce healthy returns for individual and institutional investors, asset managers must:

- **Leverage the right people**, including quantitative and fundamental portfolio managers, researchers, and analysts as well as IT specialists.
- **Utilize the right technological tools**, which enable greater integration, automation, and optimization across their portfolio management operations.
- **Put in place the right processes**, which seamlessly align the people and the technologies and ensure the best possible long-term results for clients.

One pure-play, global asset management firm that has implemented a world-class portfolio management process, employed leading portfolio management experts, and developed and deployed state-of-the-art portfolio management technological tools is Robeco. Founded in 1929, Robeco is headquartered in the Netherlands and has 17 offices worldwide and assets under management of EUR 176 billion (as of December 2020).

Although Robeco's wide range of actively managed investment strategies and solutions have yielded strong and steady returns for clients over the years, the firm is always looking for ways to bolster the strength and boost the performance of its portfolios and improve the efficiency and effectiveness of its overall portfolio management process.

One area that was identified for potential improvement by Robeco was systematic fixed-income investment portfolios, which encompass around

€12.5 billion in assets, consist of around 30,000 different investment instruments including corporate and government bonds, and are managed by the company's Insurance and Pension Solutions and Quant Fixed Income teams as well as a large group of quantitative and fundamental portfolio managers and researchers.

Although Robeco has – for more than a decade – been using mathematical optimization technologies to help construct its systematic fixed-income portfolios for private investors and financial institutions, the company wanted to enhance its portfolio management process by:

- Switching from its legacy mathematical optimization solvers (commercial and open source) to a best-of-breed solver. The mathematical optimization solver is the software engine that is used by Robeco to automatically and rapidly generate reliable and robust fixed-income portfolios on a daily basis.
- Streamlining the enterprise-wide fixed-income portfolio management system by moving it to a local and cloud-based server environment, which allows for superior cross-functional alignment and long-term scalability.

With these objectives in mind, Robeco began looking for a mathematical optimization solver that could enable the transformation of its systematic fixed-income portfolio management process.

### The Solution: Switching to the State-of-the-Art Solver

In 2020, Robeco commenced a rigorous evaluation and selection process, with the goal of finding the best mathematical optimization solver to meet the needs of the teams that construct its systematic fixed-income portfolios.

**“ Every day, we depend on the Gurobi Optimizer to deliver optimal systematic fixed-income portfolios for our private and institutional investors.”**

**Mathieu van Roon**

*Portfolio Manager, Robeco*



Over the course of a few months, Robeco's portfolio managers and other internal stakeholders conducted extensive testing of numerous commercial solvers on the market to see which could provide the necessary problem-solving speed, robustness, and flexibility as well as the right technical support and a scalable deployment architecture.

In the end, Robeco selected the Gurobi Optimizer to serve as the engine that would make its systematic fixed-income portfolio optimization process run.

Commenting on the reasons for choosing the Gurobi Optimizer, Mathieu van Roon – a Portfolio Manager at Robeco – said: “After a lengthy and thorough selection procedure that included testing several general commercial solvers and dedicated portfolio construction engines, we selected the Gurobi Optimizer based on performance (speed and robustness), flexibility (ability to solve various types of problem settings), scalability thanks to cloud-based solutions, technical support, and the competitive price level. In each of these categories, Gurobi excelled, which has led us to switch and to put Gurobi at the core of our investment processes.”

The Gurobi Optimizer was integrated into Robeco's IT infrastructure and systems in early 2021, and the teams across the asset manager's Quant Fixed Income and Insurance and Pension Solutions departments now rely on this mathematical optimization engine to generate optimal fixed-income portfolios for private investors and financial institutions.

“The switch from our previous solver technology to the Gurobi Optimizer

was fast and seamless due to the performance and flexibility of the solver and the quality of the rest of Gurobi's technical offering, including the Compute Server. We were impressed by the ease of use when incorporating the software in both our MATLAB and Python models, allowing for a smooth transition. Additionally, the Gurobi technical support team is always available to help with our technical questions, providing us with to-the-point and in-depth answers and correct solutions within hours. This world-class customer service really helped to further speed up the implementation,” van Roon said.

### **The Results: Enabling Greater Efficiency, Effectiveness, and Portfolio Performance**

With the Gurobi Optimizer, Robeco has transformed its systematic fixed-income portfolio management process by enabling:

- **Rapid and robust optimization:** Every day, Robeco's fundamental and quantitative portfolio managers and researchers use the Gurobi Optimizer to automatically optimize the allocation of assets in their systematic fixed-income portfolios in order to maximize risk-adjusted returns, minimize risk, and ensure compliance with industry regulations and investment guidelines.
- **In-depth, extensive analysis:** As the Gurobi Optimizer is able to quickly construct optimal fixed-income portfolios, Robeco's portfolio managers and researchers have enough time to carefully analyze and evaluate these portfolios and make

any necessary adjustments to the proposed allocation before actually executing any trades and rebalancing.

- **Greater integration and scalability:** The Gurobi Optimizer is utilized by teams across Robeco's Quant Fixed Income and Insurance and Pension Solutions departments, and – with its capability to be deployed in a cloud-based environment – will serve as a scalable, enterprise-wide solution for the foreseeable future.

Improved portfolio performance: With the Gurobi Optimizer, Robeco's portfolio managers and researchers can efficiently and effectively create optimal fixed-income portfolios that are in line with their investment ideas, guidelines, and strategies and deliver the best possible returns for clients.

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