Portfolio Optimization in a Large Financial Services Company

Background

A large financial services company has been engaged in the trading of securities since 1943. The company deals in equity, money market, and debt. The company provides its clients with research and advisory services, portfolio management services, registered retirement savings plans, stock savings plans, and other related services.

Challenge

The company had introduced its Monthly Payment Plan (MPP) with the offering of Series 1. The goal of the MPP was to provide a smooth, secure flow of investment income by providing regular monthly payment to unit holders and to ensure the subsequent redemption of principal invested.

MPP is a closed-end investment fund containing several "A" or better rated debt securities. The investment goal is to offer regular monthly payments of income through investment in a professionally selected portfolio of long-term, high-quality debt issued by corporates and government. MPP is not a managed fund, and the underlying securities will not be traded in an effort to realize capital gains or higher returns. Once the portfolio was constructed, it was held to maturity.

The market response to MPP was really excellent. Most series were purchased quite quickly. The face value of the portfolios had increased from $10 million for the early series to $100 million for series 12.

The company had evolved a procedure to select the bonds to be included in the portfolio. The data on possible bonds were entered in a spreadsheet, and a process of trial and error was used to select the final portfolio. This trial and error method was time consuming and also frustrating because it was not always possible to guarantee the best portfolio. The company wanted to develop an optimization solution to eliminate the time-consuming trial and error procedure and to guarantee best possible portfolio.

Solution

We developed an optimization model to meet the investment goals in order of priority as given below:

1. The value of the offering price above the face value should be minimized. 2. The average term to maturity and Macaulay duration must be close to the specified value. 3. The interest received from the bond should be maximized.

Our optimization solution was able to eliminate the time-consuming trial and error procedure and was able to guarantee best possible portfolio in few seconds.