Brown Brothers Harriman & Co. GAUSS Case Study
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At the core of Brown Brother Harriman & Co.'s (BBH) management of fixed income securities is our portfolio optimization process, developed by the Fixed Income Quantitative Research Group. The integration of the GAUSS Engine into our development toolkit has allowed us to build applications in Excel's user-friendly environment that incorporate faster and more accurate numerical algorithms.

Our first project incorporating the Engine was our proprietary PLATO system (Portfolio-Level After-Tax Optimizer), built in Visual Basic for Applications (Excel) and drawing on a Microsoft Access database containing all of the positions for each of our individually managed municipal bond portfolios. Our goal was to build a system that would allow the portfolio manager to run optimizations on their portfolios to obtain trade ideas for each specific account. The optimizations would have to account for transaction costs, be sensitive to generating taxes and return information on the problem constraints. Using GAUSS and its nonlinear optimization routines allowed us to develop a fast algorithm that was relatively easy to code.

In addition, we wanted to develop a self-contained system that could be distributed to any of the BBH offices around the country. The GAUSS Engine was the perfect solution for us since it offered a simple way to add the necessary optimization functionality to our application and make it distributable across the firm.

Since we wanted to use VBA/Excel as the front end for the system, we had to write a DLL that would link the Engine to VBA. While this took some trial and error on our part, the functionality that Aptech had already written for linking the Engine with C++ got us a good portion of the way there. The technical support team at Aptech was invaluable in helping us through the more difficult technical parts of that process.

We ended up with a tool that delivered on all of our needs and was flexible enough to allow for quick implementation of future enhancements.

This project also served as a prototype for other similar applications. We have found that Excel offers a good interface for the developer or modeler and are now building other GAUSS Engine applications for our own use in Quantitative Research.

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