

## Quantal Models Economic Effects on Securities Pricing

BERKELEY, Calif. — Fast-moving electronic markets underscore the need for a timely understanding of the risks inherent in various portfolio securities. While some hedge funds and top-tier money management firms have developed proprietary analytics to this end, **Quantal International Inc.** of Berkeley, Calif., offers investment solutions that provide accurate and up-to-date risk forecasts and risk models for global managers, featuring a multi-factor risk model and optimizer as part of the firm's flagship product, Quantal PRO (Portfolio Risk and Optimization).

Some providers of econometric structural models for equity risk focus on companies that are in the same industry and have the same earnings volatility and cross-sectional characteristics that they call factors, says Quantal President and CEO Terry Marsh. They group stocks by these characteristics with the idea that they will have similar risks. But many different types of firms may be included in an industry category in certain industry classification systems. A technology firm and an industrial old rust-belt company, for instance, could both be classified as industrial. They have different risks, but the limitations of the explicit classification scheme will result in their having similar industry classifications and to a large extent similar risk forecasts.

“At Quantal, we look for clusters of stocks that tend to move together which the market is treating as similar in risk,” says Marsh. “We look at relatively recent price behavior, and the (Quantal

PRO) engine enables us to define and accurately predict risk. A system that relies on cross-sectional characteristics to classify risk is not going to be as adaptive as the market changes,” he suggests. “Once risk structure for stocks has been predicted, we can relate the portfolio risk exposure to any observable characteristic of stocks.”

Quantal models determine the exposure of a portfolio to an industry, its exposure to companies that have high book-to-market ratios or small market caps, and soon will determine exposure to term structure movement.

Quantal PRO may be of interest and value to managers in the pre-trade space, including managers of large index funds, transitions business and long-short hedge funds. “Quantal has been very good about collaborating with us and helping us in the transition management space,” says John Sacks, Manager of Quantitative Research at **Russell Implementation Services**. “We pride ourselves on risk management,” says Sacks. “Our clients hire us to transition assets from legacy portfolios or to target portfolios. The goal is to maximize risk-adjusted performance for our clients. We are able to accomplish this through products such as Quantal.”

Russell Implementation Services, a division of **Russell Investment Group**, Tacoma, Wash., uses Quantal as a sounding board, Sacks says. “They are collaborative in helping develop products that meet the demands of our unique strategies.”

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Quantal models can help the user determine the exposure of a portfolio to an industry and its exposure to companies that have high, book-to-market ratios or small market caps.

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Over the past year, Quantal has been working on research to extend its global equities expertise across global term-structure and credit risk in a multi-factor model. “The factors that are driving term structure overlap the factors that are driving equities,” says Marsh. A plan sponsor who has both term structure and equity investments, for instance, can account for the interdependency between those, he adds. “Many vendors assume the correlation is zero or fixed,” he says. “It varies quite a bit over time. Since our specialty is up-to-date factor structures, we can capture that shifting variation.”

A multi-factor model enables asset-class convergence and cross-asset trading, as in understanding the impact of a company’s credit risk on its equities, or studying the relationship between its stocks and bonds. A Monte Carlo type simulation might include a 10-factor model controlling everything that affects equities, things like interest rates and oil prices. “Not surprisingly if all the factors are known with perfect accuracy in advance, investors could do a slightly better job of predicting by using the Quantal methodology of looking at stock price behavior and factors of those price movements,” says Lawrence Tint, Board Chairman of Quantal.

However, if there really were 11 factors, the error ratio in using an explicit factor model could be much higher. Quantal offers an implicit model where the factors are determined by looking at the behavior of the securities. In a situation where there is a new factor, and there are always new factors, if you try to use an explicit model, the error rate goes up by 300 to 400 percent, he suggests. If any factor affecting equities causes a group of stocks to behave a certain way, the manager gets the chance to decide if that behavior is rational and to protect the portfolio.

Smart users often run both models, especially if they are managing a sizeable portfolio. Sacks says Russell’s emphasis on risk control is one reason

the firm uses both types of models. “We have a platform for transitions called Portfolio Attribution and Risk Management System (PARMS),” he says. “Quantal is one of the statistical or implicit models we use in our suite. We also have fundamental factor or explicit models. We don’t want to put all our eggs in one basket. If we can look at the world of risk from various different dimensions, we feel we are looking at risk in the soundest way for our clients. Quantal has a very responsive short-term model. This is particularly important in the transition space, as most of our assignments are short-term. We need a model that is reactive to market changes.”

Russell Implementation Services uses Quantal in several ways, Sacks notes. “One is in basket or program type trades where we are trading from a basket of stocks to another basket of stocks,” he says. “We create an optimized trade that minimizes the tracking error per unit traded given the trading constraints. We call this a smart trade.”

Quantal’s Global Multi-Factor Model will be valuable for an overall portfolio view that includes fixed-income and equity selections. “A large sponsor, for example, will have a cross-asset-class portfolio, with equity managers, portfolios of governments and credit risk, and will do risk budgeting,” says Marsh. “Our vision is to integrate these models across the asset classes; the equity component, the term structure component, the credit default component,” he says. In a scientific sense, Quantal may be seen as closest to a hybrid model.

“We have one large state fund for example, that replicates a big index with fewer securities, to minimize tracking error,” says Marsh. “We have traditional investment managers who use Quantal PRO to optimize their requirements and measure the risks of their portfolios and to determine if those risks are appropriate. We have quite a few long-short equity hedge funds.” □