



May 2002

Northfield News

Quarterly Newsletter for the Friends and Clients of Northfield Information Services

Northfield News Re-launch

Northfield Information Services is pleased to announce the re-launch of Northfield News, our quarterly Newsletter for the friends and clients of Northfield. The purpose of Northfield News is to keep our readers informed of *everything* that is going on at Northfield. Each newsletter will cover the latest software and product enhancements, upcoming Northfield events, new products, the latest quantitative research advances, technical support issues, industry trends, and anything else our clients feel the need for us to cover.

Longtime Northfield clients may remember that we used to publish Northfield News several years ago. In recent years, Northfield News fell by the wayside in favor of our increased focus on new product development, and enhancing our existing product line. Since so many exciting changes have taken place in the past few years, we felt the time was right to start publishing the newsletter once again.

We hope you enjoy this new version of Northfield News. If you have any suggestions of what you would like to see covered in upcoming issues, please e-mail your ideas to staff@northinfo.com.

Inside this Issue

- ▶ **Northfield News—We're back!**
- ▶ **New Research by Northfield's Dan diBartolomeo and Sandy Warwick**
- ▶ **Optimizer Enhancements**
- ▶ **New Risk Models: US Single Country, Switzerland, Australia, China**

Making Covariance-Based Portfolio Risk Models Sensitive to the Rate at which Markets Reflect New Information

By Dan diBartolomeo and Sandy Warrick

Following is an excerpt from the first draft of a new research paper which Northfield President Dan diBartolomeo will be presenting at the Southern Finance Association Annual Membership meeting this fall.

Multiple factor models of security covariance have been widely adopted by investment practitioners as a means to forecast the volatility of portfolios. In that such models arise from the tradition of Markowitz's Modern Portfolio Theory, they have generally been based on a single period assumption, where future risk levels are presumed to not vary over time. In reality, risk levels do vary substantially and modifications of the underlying assumptions of multiple factor covariance models must change to reflect this fact. Our paper reviews the way new information is absorbed by financial markets and contributes a model of how such information can be reflected more efficiently in estimates of future covariance, through the inclusion of implied volatility information. We conclude with an empirical example regarding market conditions before and after the events of September 11, 2001. Not only does this example illustrate the value of including implied volatility as a component to covariance forecasts, but also suggests that some market participants may have acted in anticipation of the tragedies.

Special points of Interest:

- ▶ **Northfield Conferences and Seminars**
- ▶ **Focus on Customer Relationship Management**
- ▶ **New London Office**
- ▶ **New Northfield partnerships: FACTSET, Checkfree, aEcho, and New Frontier**

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Upcoming Northfield Conferences and Seminars

Training Seminar: Using NFA Resampling Within the Northfield Optimizer

Northfield Offices • Boston, MA • May 23, 2002

Since the patented NFA Resampling technology was introduced as part of the Northfield Optimizer, many clients have inquired as to how to use this new portfolio construction technique to their greatest advantage. This one day seminar will cover the particular intricacies involved with using the NFA Resampling functions within the Northfield Optimizer and will address both the theoretical and operational issues involved.

The complete seminar agenda is available at www.northinfo.com/events. There is no cost of participation, but the number of attendees will be strictly limited to just thirty-five. Please RSVP to Kathy Prasad at 617-208-2020, fax 617-451-2122, or email, kathy@northinfo.com.

Newport Annual Seminar

Tennis Hall of Fame • Newport, RI • June 7, 2002

We are pleased to invite you and your colleagues to our annual summer seminar. The purpose of the seminar is to present recent research and technical advances to our clients and friends while enjoying the many pleasures afforded by our unique venue.

This year we return to the International Tennis Hall of Fame. As always, our meeting date has been selected to coincide with the US Professional Championships of Court Tennis. This year's tournament promises to be especially strong with 6 of the top 10 players in the world. After tennis on Friday evening, an oceanfront dinner party will be held at the nearby Castle Hill Inn & Resort (Ocean Drive). While there will be no tennis tournament play on Saturday, we do have another sport planned. Weather permitting; the adventurous may join in a surfing outing at Newport's Second Beach.

There is no charge for participation in any aspect of this event. Please RSVP to Kathy Prasad at 617-208-2020, or email, kathy@northinfo.com. Detailed information, and the full seminar agenda is available at www.northinfo.com/events.

Recent Northfield Conferences and Seminars

2002 Annual Research Conference: A Time to Reflect, A Time to Look Forward

Tenaya Lodge • Yosemite National Park • May 5-7, 2002

The past year has been extraordinary difficult for all the people in the world, particularly America, and even more so for the investment community. Yosemite National Park was a fitting venue that not only encouraged reflection on the events of the past, but also reveling in how the accomplishments yet to come in our field will contribute to our community and the global society.

The conference took place at the Tenaya Lodge, a deluxe mountain resort property set on thirty five acres bordering the Sierra National Forest and adjacent to Yosemite National Park. This magnificent location allowed our conference participants the peaceful atmosphere conducive to full attention on the issues under discussion, while also offering immense Natural beauty and recreational opportunities.



Tenaya Lodge

The agenda consisted of 12 presentations, and was among the most rigorous Northfield ever assembled. Group activities included white water rafting, horseback riding, fly fishing, a black tie evening, and western cookout.

Complete conference proceedings are available at www.northinfo.com/papers

Long/Short Portfolios and Hedge Funds Seminar

Northfield Offices • Boston, MA • March 7, 2002

Northfield sponsored a one-day seminar on the particular intricacies of the management of long/short portfolios and hedge funds. The working sessions addressed both the theoretical and operational issues for managers and investors in this type of portfolio and paid particular attention to how some cutting edge techniques are being applied to improve the reliability and viability of hedge fund investing. Conference proceedings are available at www.northinfo.com/papers. Due to the overwhelming success of this seminar, a second is tentatively scheduled for summer 2002.

2001 Annual Conference: Dealing with Ultimate Uncertainty

Hotel Del Coronado • Coronado, CA • December 9-11, 2001



Hotel Del Coronado

World events in 2001 put investors in the position of facing newer and greater uncertainties than ever before. Terrorism and political instability helped create an atmosphere of psychological stress and negative economic expectations. At the same time, markets were adjusting to the collapse of the valuation bubble in technology stocks. Nevertheless, the process of investing continued to evolve in both methodological and technical frameworks. As such, the 2001 annual conference agenda of 11 one-hour presentations focused most of its attention on traditional investment topics, while closing with a presentation on how investment practitioners can prepare for the uncertain times ahead.

The conference took place at the Hotel del Coronado in Coronado California. The Del opened in 1888 as the epitome of American luxury and is renowned for its magnificent architecture and the lovely beachfront location.

In keeping with Northfield tradition, life outside the conference room was appropriately relaxed and fun. Activities included golf at the Coronado Golf Club, a Coronado biking tour, classic yacht sailing, a trip to the San Diego zoo, and the customary Northfield black tie evening following the end of Day 1. Following the “unofficial welcome Reception” on Saturday, the Navy Seals put on a spectacular fireworks display in Coronado Bay.

Complete conference proceedings are available at www.northinfo.com/papers

Enhanced Customer Relationship Management

New London Office -To better service the needs of our growing list of European Clients, Northfield officially opened a London office in August of 2001. The office is staffed by European Marketing Director Rupert Goodwin. Rupert has over 15 years experience in portfolio management, risk consulting, portfolio trading and financial quantitative research. Contact Rupert at Northfield Information Services U.K. Ltd, Shakespeare House, 168 Lavender Hill, London SW11 5TF, +44-(0)20-7801-6260, Fax +44-(0)20-7801-6261, rupert@northinfo.com.

Northfield online meetings: Northfield’s online meeting center is available at <http://northinfo.webex.com>. Using the WebEx online meeting system, which is freely accessible through a regular Internet browser, clients and prospects

can participate in interactive online sales demonstrations or technical support training sessions from the comfort and convenience of their own office. The complete on-line conference facility also includes special support session capabilities that allow Northfield staff to gain temporary access to a user’s computer in order to efficiently resolve technical problems.

Enhanced Technical Support: Northfield now has two full time technical support people with hours from 8:00 a.m to 6:00 p.m EST. If you need Technical Support help, or would like to schedule an online training session, call the new Technical support line at 617-205-2080 or e-mail to Howard Hoffman howard@northinfo.com, or Jennifer Eibeschitz, jennifer@northinfo.com.

Recent Enhancements in the Northfield Optimizer and Risk Models

The past year has seen an extraordinary set of improvements to the Northfield Optimizer. Our line of risk models has also been substantially expanded over the same period. Here are a few of the key enhancements:

NFA Resampling

The biggest enhancement to the Optimizer is the inclusion of a new software module that incorporates a new optimization technique called resampling into our process. We feel this inclusion is a profound improvement in the extent to which optimization can be practically applied to a wide range of portfolio problems. While some resampling techniques have been used at Northfield since 1992, New Frontier Advisers patented the current method a few years ago. Resampling allows Monte-Carlo simulations into the optimization process as a way of dealing with estimation errors. Such errors arise when we put our forecasts of return and risk into an optimization system, as the software has no way to realize that our estimates of the parameters of future return distributions are not certain and can simply be wrong.

Using NFA resampling offers investment managers several key advantages over traditional optimization. The first is a more stable optimization result that changes less when we make small changes to our input forecasts. The second is the ability to view optimization results such as tracking error and security weights as distributions rather than point values. For example, instead of saying that the forecast tracking error of a portfolio is 3% per year, we can say that the central tendency of our estimated distribution for tracking error is 3%, but that there is a 90% chance that the true value is in the range of 2.1% to 4.5%. Once we have this information, we may be confronted with profound choices between different portfolios that have not only different average levels of risk, but also different worst-case risk scenarios.

Similarly, individual security weights can now be considered in terms of their distribution rather than as point values. Considering asset weights as distributions has the effect of substantially lowering turnover without reduction in expected performance. In addition, the system now contains a detailed analysis of how certain we are that a particular portfolio rebalancing will actually lead to a meaningful improvement in expected portfolio performance. Effectively, we now have a robust “when to trade” rule.

The NFA system is compatible with all existing Northfield Optimizer features and can be turned on or off during optimization at the user’s option.

Composite Asset Functions

Composite assets such as stock index futures, index options and ETFs have always been difficult to handle in an optimization framework. This is because factor risk models assume that the asset specific risk of any asset is uncorrelated to the asset specific risk of any other asset. When we include composite assets in our problems, this assumption falls apart. For example, if I own an S&P 500 index future in my portfolio, and also own Microsoft stock in the portfolio, the asset specific risk of the index contract will be correlated with the asset specific portion of Microsoft risk due to the holding of Microsoft within the S&P 500 index. While it is conceptually easy to disaggregate the index contract into its constituents for the purpose of risk measurement, actually allowing the composite asset to be traded as a single security for optimization purposes was more problematic but has now been solved.

The new functions allow our users to define “composite assets” by giving them a name, security identifier and a related file of the constituents (and weights). Once defined, the composite asset can be treated like any other security with no further effort on the part of the user, while allowing correct risk assessment and optimization.

Multiple Account Features

Users that have to run large numbers of optimization problems will appreciate our new “multiple account” feature. Our Windows user interface now includes a multiple account function that allows users to easily run batches of optimization problems. Rather than have to create any type of script, the user simply creates a one large initial portfolio input file, identifying each position by an account number. For each account number, the user can define and store all the parameters of an optimization run. Once the aggregated input file has been loaded, the system will recognize how many individual portfolios are represented and will carry out all the required optimizations.

Aggregated output reports are also new and allow users to see highlights of the output reports from all the portfolios in a batch on a single page. This greatly facilitates locating any portfolios requiring special attention within a large batch. For complex batch runs that need to interact with external applications, our NISBATCH system is still available.

Single Market Equity Risk Models

Our line of factor risk models has continued to broaden with the creation of a whole new range of models dedicated to single markets. In addition to our US and Global equity models, we now have risk models for Europe (regional) and many single countries (US, UK, Japan, Australia, Canada, Switzerland, China).

All of the Single Market models have a factor structure similar to our Global model, combining both endogenous and exogenous factors. In that our Global factor structure may omit factors that are important in a single particular market, we insure the “completeness” of the model by computing the principal components of the residual return (the returns not accounted for by the model) and including components with significant eigen values as additional factors in that particular model. This technique has another important advantage in that the “blind factors” often capture risk associated with temporary market phenomena that would otherwise be omitted from our normal factor structure. Risks associated with omitted factors are otherwise incorrectly accounted for as asset specific risk that can be diversified away through a large number of holdings.

(covariance based risk models, continued from page 1)

Introduction:

Multiple factor models of security covariance have been widely adopted by investment practitioners as a means to forecast the volatility of portfolios. In that such models arise from the tradition of Markowitz’s Modern Portfolio Theory (1952), they have generally been based on a single period assumption, where future risk levels are presumed to not vary over time. In reality, risk levels do vary substantially and modifications of the underlying assumptions of multiple factor covariance models must change to reflect this fact. Our paper reviews the way new information is absorbed by financial markets, and how such information can be reflected more efficiently in estimates of future covariance through the inclusion of implied volatility information.

To the extent that levels of risk within an investment market do vary over time, such changes are due to the arrival of new information. Such new information being absorbed by market participants can be categorized into two types, the first being “news” that is wholly unanticipated, and into “announcements” that are anticipated with respect to time but not with respect content. Conditional heteroskedasticity models (ARCH, GARCH, etc.), as pioneered by Engle and Bollerslev (1986) are often used to model changes in volatility levels. However, we argue that to properly capture the dynamics of announcement data in covariance

Everything Everywhere Model

The EE model has recently gone from “beta” status into full production. This risk model is meant to address two needs of investment firms. First, an ability to support risk measurement and portfolio construction of balanced accounts including both stocks and bonds. Secondly, it can be used to assess the “firm-wide total risk” of an entire investment enterprise such as a large pension fund or asset management firm.

The EE model combines our Global equity risk model with three additional factors used to quantify the term structure of interest rates. This model also makes extensive use of a “building block” approach to allow for risk assessment of complex instruments such as callable, convertible corporate bond. Such a bond could be analyzed as a portfolio containing a risk-less bond, a credit swap, interest rate options (the call feature) and an equity warrant (conversion to equity). Of course, the tricky aspect of such a portfolio is that some of the portfolio pieces disappear when the option features are exercised. For details on the new approach we have introduced to handle convertible bonds, see the related presentation from the proceedings of our recent conference at Yosemite at www.northinfo.com/papers.

models, methods incorporating data on implied volatility is necessary, and that use of implied volatility data is also the preferred approach to properly reflecting wholly unanticipated news in such models.

One practitioner model of equity security covariance incorporating implied volatility information has been commercially available for a few years. The model has been used by numerous hedge funds since 1999. We present the estimation process for this model as an example of how such incorporation is possible, and to highlight some of the related difficulties.

Finally, we will turn to an empirical example. We will illustrate how quickly the model was able to adapt to the changes in the apparent risk levels of various US stock market sectors connected with the tragic events of September 11, 2001. A surprising aspect of this example is the emergence of data suggesting that some market participants may have acted in anticipation of these tragedies.

We conclude that both a growing body of finance literature and the practitioner experience support the usage of implied volatility information in the estimation of future portfolio risk levels.

The complete text of this paper can be found on the Northfield Website at www.northinfo.com/papers.

Northfield Partnerships

Northfield solutions have become more visible in the marketplace recently as a result of our renewed partnering efforts. With the increased interest in investing by the retail segment, we have sought to expand our brand by partnering with other parties that are interested in embedding our products into their online applications to differentiate their offerings and enhance their customers' investment experience. Our partnering strategy has focused on working with companies positioned to expand their own reach by utilizing Northfield tools that both complement and enhance their own marketing strategy and product suite. This has involved relationships with partners on both a disclosed and non disclosed basis depending upon their own particular marketing approach.

One of our most important partners is [Factset Research Systems](#) on the research and portfolio structuring side of the business, a relationship that has resulted in increased business and exposure to new clients and new business areas within existing clients for both companies. Clients of Northfield on Factset have grown fourfold since early 2001. Furthermore it has expanded Factset's perception to be one of both a data and analytics provider while giving Northfield an expanded client base. Planned enhancements to Northfield on Factset this year include the availability of Northfield risk analytics to client's of Factset's Portfolio Managers Workstation.

In the managed accounts space, our partnership with [Checkfree Investment Services](#) has begun to bear fruit. This happened as a result of our development of an application that embeds Northfield's risk and optimization engines to address automation of the managed accounts process with another partner, [Softpak Financial Systems](#). The link to and from Checkfree's portfolio accounting and order routing system has been integrated within the application by Softpak to make the process seamless to users. In addition Softpak has built a front end that allows users to easily group accounts by sponsor or model portfolio and process them in large batches using Northfield risk and portfolio construction engines.

Additional functionality for back testing and performance attribution will be available within the same platform later this year.

The release of the Northfield optimizer with our partner [New Frontier Advisors'](#) efficient re-sampling in August 2001 coupled with a choppy market has given many firms an incentive to take a closer look at their rebalancing strategies. Efficient re-sampling gives managers the ability to assess whether rebalancing makes sense by providing the manager with a signal within a given confidence interval regarding the viability of rebalancing thus reducing transaction costs. We believe that efficient re-sampling will have a significant impact on the transaction costs for those quantitatively oriented managers in the managed accounts space and to an even greater extent as other managers rely more on quantitative methods as part of their managed accounts process.

On the international scene, as you may know the People's Republic of China was admitted to the World Trade Organization in December 2001. Northfield quickly took advantage of this opportunity by partnering with [aEcho Communications Ltd.](#) to develop an equity risk model to address the specific requirements of the Chinese market. aEcho provides products and services to the financial community of China and is Northfield's exclusive agent for distribution of our products to the Chinese market including the newly available China equity model. We think that this is an exciting time for China's financial markets as they evolve and Northfield is proud to be a participant.

On the enterprise risk management front, Northfield risk models will be made available through Sungard's Panorama risk management system to present risks as viewed from an asset management perspective in their enterprise wide platform. This development is the result of our partnership with [Alpha Strategies LLP](#), a quantitative investment firm providing customized analytical solutions to the financial community.



184 High Street, 5th Floor
Boston, MA 02110

Phone: 617.451.2222
Fax: 617.451.2122
Sales: 617.208.2050
Tech Support: 617.208.2080