September 2010

Northfield News

A Newsletter for the Friends and Clients of Northfield Information Services

Northfield for Everyone: Analytics for Private Wealth

By Dan diBartolomeo

Ever since our founding, Northfield has been keenly attentive to the special needs of asset managers such as trust departments and family offices that handle private wealth. Recently, we decided to expand our offerings in this area to include a new range of asset allocation and fund selection tools that are appropriate to the needs of small RIAs, consultants and retail financial advisers. Much in the spirit of the broad asset coverage of our "Everything, Everywhere" risk model, we want to broaden the analytical reach of our services to include investment professionals serving "Everyone."

One of our first clients was a very prominent family office. Also, the agenda of our first research conference in Venice, Italy in 1989 had two presentations focused on the peculiarities of managing taxable portfolios. In the intervening twenty-one years, Northfield has made numerous innovations in analytical tools for the private wealth manager. In 1996, we introduced the first optimizer that provided a practical way to effectively include lot level capital gain taxes into an optimization. Our Allocation Research Toolkit service has always included both the ability to incorporate income and capital gain taxes into asset allocation decisions, and an AHP facility that can be used to go from a simple multiple choice investor questionnaire to appropriate asset allocations or fund selection decisions for individual investors.

Since the late 1990s, our MARS platform has been adopted around the world from America to Australia by many of the largest private wealth managers. MARS allows managers to bring the full range of Northfield's risk, trading cost and tax optimization models to bear on up to tens or even hundreds of thousands of customized, heterogeneous portfolios in a way that improves investment results, provides better quality assurance and decreases labor expenses. A current MARS implementation being done with Fidelity's Institutional Wealth Services division will eventually make our analytics available to thousands of independent investment advisors handling more than 1.5 Million portfolios. While we are pleased to note that the "industrial strength" of MARS is the process of choice for many top firms, we are equally disheartened by the large number of taxable account managers who continue to ignore taxes entirely in managing taxable accounts. Although it is clear to everyone in the industry that after-tax returns are what economically matter to taxable investors, many firms continue to take the view that "we can ignore taxes entirely as long as our competitor managers do the same." In our view, this position of intentionally providing less than the best available services to separate account clients is unsustainable in the long run, and borders on a breach of fiduciary responsibility.

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Special Points of Interest:

- Main Article: Northfield for Everyone: Analytics for Private Wealth
- Annual Asia Seminar Agendas
- Tech Support Tip: Multiperiod Approximation
- London Seminar-Nov.

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Inside This Issue:

Recent and Upcoming Events

Northfield Asia Seminar Series – Research on Investment Management and Risk
Hong Kong ● Singapore ● Sydney ● Tokyo

Northfield will be hosting four one day seminars in Hong Kong, Singapore, Sydney and Tokyo. The purpose of the seminars is to showcase our research on various topics in investment and risk management to our growing list of Australian and Far East clients and prospects.

Tokyo:
Wednesday, September 22, 2010, 9:00 am - 4:30 pm ● Mandarin Oriental, Nihonbashi, Tokyo

Hong Kong:
Monday, September 27, 2010, 9:00 am - 4:30 pm ● Landmark Mandarin , Central, Hong Kong

Singapore:
Friday, October 1, 2010, 9:00 am – 4:30 pm ● The Raffles Hotel, Singapore

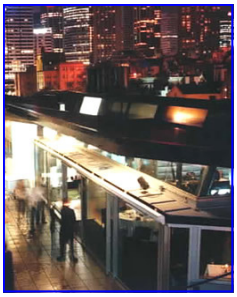
Sydney:
Tuesday, October 5, 2010, 2010, 9:00 am - 4:30 pm ● The Quay Restaurant, The Rocks, Sydney

Agenda:
The agenda will consist of six presentations. Check **http://www.northinfo.com/events.cfm** for the detailed agendas that include the presentation abstracts.

Sydney and Tokyo
- Incorporation of Strategy Risk into Portfolio Assessment and Optimization
- First-Passage Probability as a Measure of Intra-Horizon Risk
- Incorporation of Liquidity Risks Arising from Expected Trading Costs into Equity Risk Estimates
- Improving Portfolio Construction through Adjustment for Parameter Estimation Error: an empirical comparison of the recent performance of four approaches in Asia equity markets
- The Discretionary Wealth Hypothesis in an Arbitrage-Free Term Structure Approach to Asset-Liability Management
- Equity Risk, Credit Risk, Default Correlation and Corporate Sustainability

Hong Kong and Singapore
For the Hong Kong and Singapore seminars, the "Improving Portfolio Construction through Adjustment for Parameter Estimation Error" presentation is replaced with "The Stakes Go Up in Social Investing: New Evidence, New Controverise" which will be presented by guest speaker Lloyd Kurtz, CFA, Chief Investment Officer at Nelson Capital.

Contact Nick Wade in Tokyo if you would like to attend, **+81.3.5403.4655** or e-mail: **nick@northinfo.com.** There is no cost for registering for any of the seminars.


Quay Restaurant


Mandarin Oriental


Landmark Mandarin


Raffles Hotel

Northfield Webinar: The Central Paradox of Active Management

October 19, 2010 • 11:00 a.m, E.S.T.

Northfield President Dan diBartolomeo will be hosting a webinar presentation on The Central Paradox of Active Management, on Tuesday, October 19th at 11:00 a.m., Eastern Standard Time. This presentation will be the first installment of what will be an ongoing series of monthly webinars and workshops.

There is no charge to participate. To register, and view the detailed abstract for the presentation visit **https://northinfoevents.webex.com.**

Northfield Annual European Investment Seminar

Le Méridien, Piccadilly, London • November 9th, 2010

Northfield will be hosting our annual European Investment Seminar on November 9th. The purpose of the seminar is to showcase research on various topics in investment and risk management to our European clients.

Further details will be posted to **http://northinfo.com/events.cfm** as the agenda become finalized. Contact Northfield's London office for further details, **neil@northinfo-europe.com, rupert@northinfo-europe.com, david@northinfo-europe.com,** or +44-(0)-20-7801-6027.

Le Méridien, Piccadilly

2010 Northfield Annual Research Conference Wrap-up

The BRO^{A}DMOOR • Colorado Springs, Colorado • August 30th-September 1st, 2010

Northfield held its 23rd annual research conference at the BRO^{A}DMOOR, a five star resort located on 3,000 lush acres under the shadow of Cheyenne Mountain in the Colorado Rockies.

The conference presented recent research and technical advances to a sold out audience of Northfield clients and friends. The agenda consisted of thirteen presentations. Topics included: "How to Respect the Principle of Equal Opportunity in Currency Investing," "A New Approach to Measuring Volatility," "Comovement, Cross-sectional Volatility and the Potential for Active Management," "Motivational Performance Measurement," "The Decomposition Verses The Decision-Evaluation of Active Risk-Adjusted Returns," "Carrier Portfolios and Exotic Index Replication," "A Note on the Returns From Minimum Variance Investing," "Getting the Information Edge with News Flow," "High-Frequency Equities Trading and Microstructural Cost Effects for Institutional Orders," "Problems with Using Four-Quarter Trailing Numbers in Investment Models," "Portfolio Construction and Asset Allocation," "Return Forecasting by Quantile Regression," and "Equity Risk, Credit Risk, Default Correlation and Corporate Sustainability."

The conference started on Sunday evening with the "Unofficial" welcome cocktail party and dinner. Monday morning was reserved for recreational pursuits. Conference attendees had a choice of taking a mountain helicopter tour, Colorado River rafting, hiking in Cheyenne Canyon, golf or a Jeep tour.

Monday evening featured the traditional Northfield elegant "black tie" gala. This year's gala featured a live band playing contemporary rock and pop. Following dinner, the party kicked into high gear with music, drinks and dancing.

The final dinner on Tuesday evening was a cowboy themed "Rocky Mountain High Night" which featured lassoing lessons, live country music and line dancing. Animal trainers were also on hand with two friendly wolfs which attendees were allowed to pet.

The complete seminar proceedings have been posted at **http://www.northinfo.com/papersearch.cfm**

Tech Support Tip: Multiperiod Approximation

By Mike Knezevich

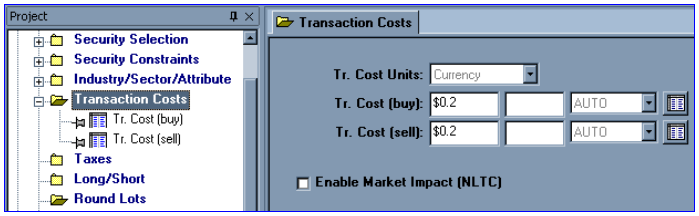
Traditionally, modern portfolio theory assumes a single holding period for an optimized portfolio. In practice this assumption is inaccurate as investors will re-balance their portfolios sometime in the near future[1]. Northfield has introduced a Multiperiod Approximation adjustment to account for anticipated portfolio re-balancing. This functionality differentiates portfolios with equal utility, preferencing the portfolio most similar to that of the initial portfolio. The idea being to keep the portfolio more closely aligned to the initial portfolio while moving gradually to optimality over time will eventually outperform due to less turnover cost and still stay consistent with the path to optimality.

This article discusses the mechanics of the Multiperiod Approximation adjustment with use of an example which may be replicated with the Northfield Optimizer.

Let's start with an initial portfolio of all cash versus a benchmark which is 50% JNJ and 50% IBM. The universe of purchasable assets is those included in the benchmark

ID	Name	InitWt(%)	BnWT(%)
*$$$	Cash	100	0
IBM	IBM Corp	0	50
JNJ	Johnson & Johnson	0	50

Transaction cost are $.20/share for both buy and sell:



First optimize the portfolio with the Multiperiod Approximation disabled. By default no adjustment is included in the optimization:

This optimal portfolio is the base case to compare the impact of the Multiperiod Approximation against:

ID	Name	Opt Wt(%)	Bn Wt(%)	Trans Buy %	Trans Sell(%)
*$$$	Cash	4.5316	0.0000	0.0000	0.0000
IBM	IBM Corp.	50.9994	50.0000	0.1624	0.1624
JNJ	Johnson & Johnson	44.4691	50.0000	0.3508	0.3508

The utility decomposition for the base case base optimal portfolio (unadjusted) illustrates that the majority of the cost to utility is transaction cost-related.

Risk(v)	
Factor	0.6100
Stock Specific	0.2800
Total	0.8900
RAP	100
Risk Cost	-0.0089
Amortized Transaction Cost %	-0.2388
Portfolio Utility	-0.2477

Next, enable the Multiperiod Approximation and set the adjustment frequency to a non-zero number. Acceptable values range between 1 and 10. Adjustment frequency determines the number of iterations between adjustments. If the adjustment frequency is set to 1, the adjustment is applied at each iteration in the optimization loop. If the frequency is 10, the adjustment is applied every 10th iteration. The more frequently (at each iteration = value of 1) the adjustment is applied, the slower the processing speed.

During the adjustment process the optimizer dynamically changes Cost Amortization until a portfolio is constructed that is more closely aligned with the initial portfolio, but similar in utility with the unadjusted optimal portfolio.

The Multiperiod Approximation adjustment process:

In this example the optimal portfolio has already been determined, although this article demonstrates the step-by-step adjustments occurring during the optimization.

1.) Determine the utility z-score of the adjusted optimal portfolio at the k^{th} iteration (Z_k) versus the initial portfolio.

$$Z_k = [(U_k - U_i)/S_{ik}] * \text{sqrt}(100/TA)$$

Where:

U_k = Portfolio Utility of the k^{th} iteration
U_i = Portfolio Utility of the initial portfolio
S_{ik} = Tracking error between initial portfolio and the k^{th} iteration portfolio
TA = Cost Amortization, the default of 100 is used

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a.) The optimization summary report in the optimizer supplies the utility for the initial and the adjusted optimal portfolios.

Optimization Summary

	Initial		Optimal	
	Return	Risk(v)	Return	Risk(v)
Factor	0.00	291.01	0.00	1.87
Stock Specific	0.00	40.33	0.00	0.85
Total	0.00	331.34	0.00	2.72
Tracking Error	18.20		1.65	
Portfolio Utility	-3.31		-0.25	

b.) Setting initial vs. the adjusted optimal portfolio, a Run0 provides the tracking error number:

Tracking Error	17.00

The z-score calculation:

$$Z_k = [(-.25 - (-3.31))/17] * \text{sqrt}(100/100) = 0.18$$

2.) Determine the cumulative probability distribution for the z-score using the NORMSDIST functionality in Excel:

$$\text{NORMSDIST}(0.18) = 0.571424$$

3.) Calculate the Adjusted Transaction Amortization (ATA):

$$ATA = 100/0.571424 = 175.0015$$

This adjustment is illustrated in the Cost Amortization Chart. **(See Graph at bottom of page)**

Adjusted Transaction Amortization affects the utility function by increasing the importance of transaction cost.

$$U = a - (Var/ RAP) - ((C + T) * ATA)$$

Comparing the optimal portfolio under the default assumption of TA = 100 versus the adjusted optimal portfolio with ATA = 175, the utility remains relatively indifferent while the breakdown between risk and transaction cost have changed.

1.) There is greater risk cost (Total Variance/RAP) versus the benchmark for the adjusted optimal portfolio. **(see 1 below)**

2.) Cost is amortized at a higher rate. Although the transaction cost per share doesn't change the amount recognized does. This in turn leads to a lower level of turnover. **(see 2 below)**

Transaction Amortization (TA)	100	175	
Factor	0.6100	1.8700	
Stock Specific	0.2800	0.8500	
Total	0.8900	2.7200	
RAP	100	100	
Risk Cost	-0.0089	-0.0272	(1)
Amortized Transaction Cost %	-0.2388	-0.2255	(2)
Portfolio Utility	-0.2477	-0.2527	

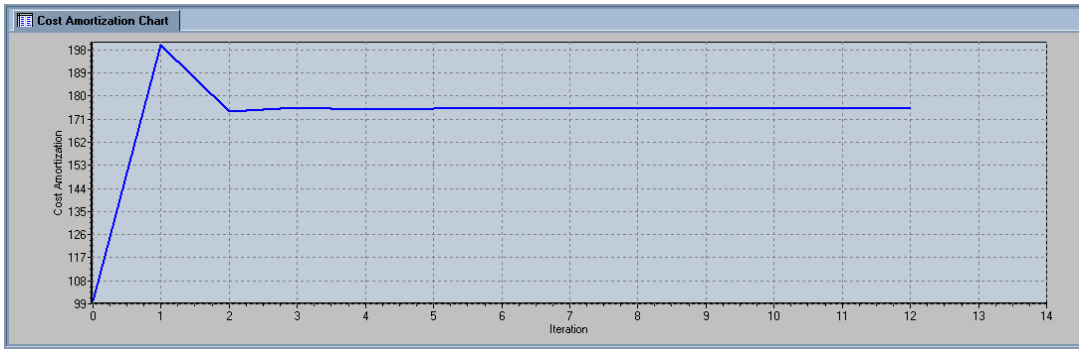
The resulting adjusted optimal portfolio is more highly correlated to the initial portfolio and has a higher tracking error to the benchmark with less turnover. This portfolio could eventually be re-balanced closer to the unadjusted optimal portfolio over multiple periods.

			Unadjusted Portfolio		Adjusted Portfolio	
ID	Init Wt(%)	Bn Wt(%)	Opt Wt(%)	Trans Cost(%)	Opt Wt(%)	Trans Cost(%)
*$$$	100	0	4.5316	0.0000	7.9302	0.0000
IBM	0	50	50.9994	0.1624	51.7473	0.1624
JNJ	0	50	44.4691	0.3508	40.3225	0.3508

The Multiperiod Approximation adjustment available in the Northfield Optimizer takes into account the inevitable reality that investors will trade their portfolios in the future. By incorporating a higher level of amortization in the transaction cost the optimizer chooses a portfolio closer to the initial portfolio with similar utility to the unadjusted optimal portfolio allowing for lower transaction cost and a gradual move to the optimal portfolio.

[1] If inputs are independent over a series of optimizations then this assumption would be perfectly correct.

Dan diBartolomeo http://www.northinfo.com/documents/329.pdf



(Private Wealth continued from page 1)

Starting in 2004, Northfield has also provided real estate risk analysis. As noted elsewhere in this issue of our newsletter, we have also recently expanded staffing the area of real estate risk. We believe this point should be welcomed by private wealth managers, as a large fraction of the wealth of high net-worth households is held in the form of real estate. The recent financial crisis amply demonstrated real estate values do indeed go down as well as up across the US and around the world. Trust companies and family offices can count on Northfield to provide robust analysis of real estate risks for their client portfolios in ways that can be aggregated with market security risks into a single integrated risk picture. In related work, our Everything, Everywhere model provides issue level coverage of the more than one million US municipal bond issues. Our work with municipal bonds is based on a proprietary model of credit risk that models the tax revenue streams of about one hundred regional economies (all states and major cities) as a function of the economic makeup of the local area.

Along with our technical innovations, Northfield has also been a thought leader in the area of private wealth. I have published several papers on tax optimization and related topics in professional journals and textbooks. In addition, I was one of three co-authors (with Jarrod Wilcox and Jeffrey Horvitz) to write the CFA Institute handbook on "Investment Management for Private, Taxable Wealth" in 2006. This short volume provides an excellent reference for all aspects of "best practices" for private wealth management in the modern era. Several other Northfield staff and affiliated academics have contributed to the financial literature of private wealth. One such effort was a paper by Sandy Warrick and Professor Paul Bolster of Northeastern University in the Journal of Wealth Management. This paper used our AHP method to create customized asset allocation for individual investors and household. This new method combined mean-variance optimality with a non-parametric approach to selecting investments to match an investor's "suitability" profile. Northfield's commercial applications of this "dual goal" approach went live during the "dot.com" era. Another academic, Chris Petruzzi, who has done consulting work for Northfield in the past, holds a patent on an asset allocation technique that operates on different preferences of private and institutional investors given their different needs for tax avoidance, liquidity and risk aversion. Chris presented on this work at our annual research conference back in the 1990s.

In the upcoming year, Northfield will be introducing an online application of a profound concept in private wealth investing. In 2003, my CFA handbook co-author Jarrod Wilcox published a paper called "Harry Markowitz and the Discretionary Wealth Hypothesis" (DWH) in the Journal of Portfolio Management. We believe this is the first method to provide a robust, theoretical answer to the question of how aggressive or conservative an investor ought be given their particular financial circumstances. In short, the approach summarizes an individual's financial position in the form of a balance sheet (including the present value of future retirement and other consumption spending and the present value of expected future savings). From this balance sheet, it is possible for the financial professional to analytically derive the optimal degree of risk aversion for their investment clients, and vary that degree of risk aversion over time as financial markets and changes in personal financial circumstances require. In short, we finally have a way to disentangle the shape of the mean-variance efficient frontier (based on the financial advisers capital market expectations) and where a particular investor should be located on that frontier given the financial picture of their household. The new service will also be ideal for corporations seeking to provide meaningful and unbiased analysis to employees participating in defined contribution retirement plants.

This new suite will also include a second powerful innovation. The ability to separately define the same asset class across taxable, tax deferred and tax exempt accounts *so as to simultaneously solve for both optimal asset allocation and asset location* (which type of investments to hold in which accounts). This same capability can be applied to solve for optimal "household level" asset allocation across the heterogeneous tax circumstances and risk aversion of multiple family members.

Along with making a profound step forward in asset allocation methods for private wealth, we will also be introducing an AHP based service module that helps advisers match particular funds, ETFs and other financial products to their clients in order to provide a complete solution to individual investor portfolio formation that is both analytically robust and able to be fully automated. Advisers will be able to make better investment decisions with less time and effort, creating a significant advantage to both investor and adviser. Finally, we have extended the DWH concept to include a more sophisticated approach to discounting future liabilities to present value. I presented on these concepts at our most recent Newport seminar. The proceedings have been posted to **http://www.northinfo.com/papersearch.cfm?.** I will also be presenting this research at the CFA Private Wealth conference in Singapore at the end of September.

(Private Wealth, Continued on page 7)

(Private Wealth, continued from page 6)

We are currently open to interested parties to act as "alpha" and "beta" testers for these new services and invite all of our clients that manage private wealth to investigate what we believe are substantial investment and business advantages of our range of services. The new tools provide literally state of the art approaches to asset allocation and financial product selection. Used in combination with the MARS platform that can rebalance portfolios optimally down to the specific tax lot level, private wealth managers can have unprecedented ability to manage a large book of private client accounts with the highest possible level of both rigorous financial analysis and operational efficiency.

Northfield Partner Update

Thomson Reuters Quantitative Analytics

Northfield risk models are now available through Thomson Reuters Quantitative Analytics, a suite of solutions for quantitative research. Northfield risk models are available in QA Direct, a normalized financial database which can be accessed directly from Microsoft SQL 2005 or Oracle. MarketQA also offers access to Northfield risk models through the same normalized database and includes a proprietary scripting language that utilizes the Northfield Open Optimizer and risk analytics. Both platforms are targeted towards quantitative analysts at hedge funds and institutional managers that want to embed Northfield tools within their own custom analyses. Please contact Thomson Reuters Quantitative Analytics for more information: **http://interact.thomsonreuters.com/quantitativeanalytics/**

Opturo

Opturo, a Boston based financial software and service firm, has integrated Northfield risk models for measuring and monitoring portfolio level risk and risk based performance attribution within their web-based ODIN and plug & play VIA platforms. Opturo provides solutions that assist in optimizing the investment processes of quantitative managers and hedge funds. Please contact Opturo sales **sales@opturo.com** for more information.

Dan Featured in CFA "Take 15" Interview

Northfield President Dan diBartolomeo was interviewed by Steve Horan for a CFA "Take 15" interview at the CFA Institute Annual Conference. Dan discussed how to estimate market sentiment and how to incorporate it into portfolio management and use it to estimate volatility. The recorded interview can be accessed at: **https://www.cfawebcasts.org/modules/catalog/CourseDetails.aspx?ProductGroupID=7771**.

Northfield Speaking Engagements

Northfield President Dan diBartolomeo spoke at the September 9th IMN Investment Conference in Cape Town South Africa. The topic was Risk and Attribution in the Post-Madoff World.

On September 13th, Dan conducted a joint presentation with Northfield staffer Chris Kantos at the London Quant Group Annual Conference in Cambridge, UK. The topic was "Incorporating Liquidity Risk from Expected Trading Costs into Portfolio Risk Assessments." Dan will be presenting this same presentation at the December 1st PRMIA Seminar, in Montreal, Canada.

Dan presented The Discretionary Wealth Hypothesis in an Arbitrage-Free Term Structure Approach to Asset-Liability Management on September 14th at the OptiRisk ALM Seminar, London, UK.

On September 24th, Dan presented at the Tokyo Quant Network Forum. The topic was "Incorporation of Strategy Risk into Portfolio Risk and Optimization."

Dan will be presenting "Asset Liability Management for the Private Client." at the CFA Institute Private Wealth Conference, in Singapore on September 29th.

Dan will be presenting at two CFA Society events in Brazil in October. The presentation for both will be "Equity Risk, Credit Risk and Corporate Sustainability." The CFA Society of Rio de Janiero event will take place on the 21st. The CFA Society of San Paulo event will take place on the 22nd. Dan will be giving this same presentation at the December 8th, QWAFAFEW meeting in New York.

Dan will be conducting a panel discussion at the MIT Program on Investment Technology, Cambridge MA on November 3rd.

Dan will be giving a presentation at the Independent Research Provider Conference, London, UK, on November 11th. The topic is to be announced.

On November 13th, Dan will be at the University of British Columbia Investment Conference, Vancouver Canada. He will be presenting "Ethical Considerations in Investment Management: Post-Madoff."

Steve Dyer Transitions to Technical Support

Steve Dyer has transitioned to Northfield Technical Support where he will be offering technical assistance and training to Northfield's US clients.

Steve joined Northfield in a part-time research role in the summer of 2009. Before coming to Northfield, Steve did nutritional epidemiology research at Tufts University's Jean Mayer Human Nutrition Research Center on Aging.

Steve holds bachelor's degrees from Tufts University in Biology and Spanish. He is fluent in Spanish which should prove valuable for Northfield's upcoming planned expansion into Latin America. Steve can be reached at 617.208.2080, **support@northinfo.com**.

Northfield In Latin America

Effective October 2010, Northfield will formally begin to provide our services in Latin America. To start the effort off, Dan diBartolomeo and Ian Bomberowitz will be taking a trip to Brazil to initiate Northfield's sales push in the region. Dan will be giving a talk "Equity Risk, Credit Risk, Default Correlation and Corporate Sustainability" at the CFA breakfast on October 21st in Rio de Janeiro and then again on the 22nd in Sao Paulo for the CFA's monthly lunch. Ian and Dan will also be visiting prospects that week. Although the sales mandate is Latin America, Brazil has the most sophisticated and robust economy in the region so that is where Northfield's initial service efforts will begin. Northfield is currently able to cover Brazilian equity instruments, bonds issued in Brazil that are denominated in major world currencies, and by the start of the new year, bonds denominated in Brazilian Reals. Looking forward into the future, the plan for Latin American sales will expand into Mexico City, Peru, Chile, and Argentina. The trip in October and Dan's talks to the CFA societies in Rio and Sao Paulo should be a great launching pad for Northfield's entrance into serving both local firms and the Latin American operations of our global clients. Interested parties should contact Ian at our Boston office for more information. Ian can be reached at 617.208.2041, **ian@northinfo.com**.

Rick Gold Joins Northfield

We are pleased to announce that Rick Gold has joined the Northfield research team. Rick has been a friend of Northfield for over fifteen years and has spoken at a number of Northfield conferences previously. Rick's primary responsibilities will be to help expand Northfield's real estate public and private sector practice capabilities including our U.S., Global REIT, and Private Equity real estate risk models. Rick will also serve as a real estate modeling product specialist supporting Northfield's sales and client service efforts.

Prior to joining Northfield, Rick was Senior Director at Grosvenor Investment Management and Grosvenor Americas' which are wholly owned subsidiaries of Grosvenor Group of London, UK. Previously, Rick has held senior research positions at Lend Lease, Aetna as well as REIS, F.W. Dodge, and DRI. In addition, he was editor of the *Journal of Real Estate Portfolio Management* and has authored a number of real-estate related publications ranging from how uncertainty affects the efficient frontier to the use of Parkinson's measure of extreme volatility in geospatial modeling.

Rick has a B.A. from the University of Redlands and Master's Degrees in Economics and International Studies from Ohio University. Welcome Rick Gold to Northfield. Contacts: 617.208.2025 or **rick@northinfo.com** .

Northfield Now on LinkedIn

Northfield has now been established on the LinkedIn business oriented social networking site. The group currently has over 120 members. To become a member of the group, visit **http://www.linkedin.com/groupInvitation?groupID=2228261**

For a complete index of all former Northfield News articles, visit http://www.northinfo.com/documents/314.pdf

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