Northfield News

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Controversial Issues in Quant Asset Management
By Dan diBartolomeo

Another thing I must point out is that you cannot prove a vague theory wrong. […] Also, if the process of computing the consequences is indefinite, then with a little skill any experimental result can be made to look like the expected consequences. —Richard Feynman [1964]

In our 2013 commentary, "The Near Death Experience of Quant Asset Management," we asserted that many aspects of the quantitative asset management process were widely misunderstood. In this article we present brief commentary on a few more of the controversial issues of quantitative asset management.

Back-testing is a Useful Measure of the Expected Performance of a Strategy

It should be logically obvious that any "back-test" is an upward biased estimate of how well a strategy could work. Having observed what strategies have worked in the past, we then construct some variation on what we already know has worked, and simulate what the past performance would have been. Unsurprisingly, our test strategies seem to have great efficiency. A measure of the degree of bias is well developed in Bailey, Borwein, Lopez de Prado, and Zhu (2014). Their paper makes reference to "financial charlatanism" with respect to most back-tests.

There is also a lack of recognition that typical back-tests do not possess a meaningful degree of statistical *power*. Put simply, the history that we have lived through is but one of an infinite number of paths that history might have taken over any given period of time. To suggest that we can construct a strategy that would have worked well on the one sequence of events that we happened to experience does not provide any evidence that our strategy would have worked well over any of the other possible sequences of events, even if we constrain the problem (not realistic) to the cases where we hold the distributional properties of the problem constant. Testing over a large potential range of alternative scenarios and paths through history is a large-scale computational exercise that most investment firms are unwilling to undertake.

An interesting aspect of the back-testing problem for equity managers is that for strategies that do not rely on very short term signals (i.e. intra-day), there *may not be any need to back-test at all* to learn whether a particular strategy is likely to produce good outcomes. Most back-tests involve some kind of return prediction model whose effectiveness can be summarized as an information coefficient (IC). There may also be time decay in the IC and variation in the IC over time. In addition, our portfolio construction process must take into account the risks of the portfolio according to some model of covariance, as well as some representation of transaction costs. Under the very reasonable simplifying assumption that the percentage market impact cost of trades is linear in trade size, a closed form solution as was derived in Sneddon (2007) for the expected value of the long term (multi-period) information ratio (IR) of any strategy, given the other inputs. An earlier version of the aforementioned Sneddon (2007) was presented at Northfield's 2005 research conference **http://www.northinfo.com/documents/180.pdf**.

Upcoming and Recent Events

2014 Northfield Annual Research Conference Wrap-up
The Stowe Mountain Lodge ● Stowe, Vermont ● October 5-8, 2014

Northfield held its 27th annual research conference at the Stowe Mountain Lodge in scenic Stowe Vermont.

The conference presented recent research and technical advances to a sold out audience of Northfield clients and friends. The agenda consisted of twelve presentations. Topics included: "AIG Before, During and After the Crisis," "A Critical Review of Correlation-based Measures of Portfolio Diversification," "Decomposing Variance Risk Measure for Long-Term Investors," "Did you choose well the when, where and to whom you were born?," "On a Positive Definition of Asset Specific Risk," "Smart Portfolios," "TRC Networks and Systematic Risk," "The Art of Tracking Corporate Bond Indices," "The Low Beta Anomaly," "To Rebalance or Not to Rebalance?," " Valuation of Asset Management Firms: Solving the HUBERMAN-Puzzle" and " What Would Yale Do If It Were Taxable?".

Stowe Mountain Lodge

The conference started on Sunday evening with the "unofficial" welcome cocktail party and dinner. Monday afternoon was reserved for recreational pursuits. Conference attendees had a choice of Northfield sponsored activities including hiking, glider rides, a Smuggler's Notch zip line tour, a kayaking wine tasting tour, and lastly, a "Taste of Vermont" tour which featured a tour of the world famous Ben and Jerry's ice cream factory.

Monday evening featured the traditional Northfield elegant "black tie" gala. The final group dinner on Tuesday featured a live band and also a fireworks display on the mountain.

The proceedings have been posted to http://www.northinfo.com/research.php.

Northfield Asia Seminars Wrap-up
Hong Kong ● Singapore ● Sydney ● November 2014

Northfield hosted our annual Asia Seminar Series with three highly successful events in Hong Kong, Singapore and Sydney. The seminars showcased our research on key topics in investment and risk management to our growing family of Australian and Far Eastern clients and prospects and broadened awareness of the range and depth of Northfield products, services, and research.

The presentations were given by Northfield's Dan diBartolomeo, Chris Kantos, Nick Wade and James Williams. Topics included: "Does Market Efficiency Imply That Long Term Returns Must be Predictable?," "On a Positive Definition of Asset Specific Risk," "Portfolio Optimization with VaR, CVaR, Skew and Kurtosis," "Risk Decomposition of Investment Portfolios," "Risk Management Priorities for Asset Owners: What Senior Management and Trustees Need to Know" and "Understanding the Distribution of Hedge Fund Returns."

The proceedings are posted at http://www.northinfo.com/research.php.

Northfield Annual Holiday Party Wrap-up
Boston ● December 11, 2014

Clients and friends joined Northfield for our annual holiday party on the evening of December 11th.

Complimentary cocktails and and Hors d'Oeuvres were served. A band made up of students from the Berkeley College of Music provided the evening's entertainment.

This is an annual event which is open to all. Registration goes live in November, so check the Northfield website next year if you missed this year's party.

Webinar: Alpha Estimation for Quantitative Asset Managers and the Definition of Asset Specific Risk
January 7, 2015 ● 11:00 AM EST

Northfield President Dan diBartolomeo will be hosting a webinar on January 7, 2015.

Abstract

Investment models routinely make distinctions between factor and idiosyncratic (asset specific) risk. This division is enshrined in theories such as the CAPM and the APT. The estimated magnitudes of stock specific risks are also a key metric of the opportunity set for active equity managers, and are widely used in the scaling of alpha expectations (See Grinold 1994). In the conventional process of constructing factor risk models, we arrive at an estimate of idiosyncratic risk for stocks by virtue of a negative rather than positive specification. We take idiosyncratic risk of an asset to be closely related to the residual portion of the asset's observed return variance that we cannot explain by virtue of our specification of factors rather than actually trying to directly estimate what the true degree of idiosyncratic risk actually is. Such conventional processes have numerous implications that should be of interest to investors. For example, it implies that different factor specifications of risk models may arrive at different estimates of asset specific risk even with the same input data. In this presentation, we will first examine whether variation of estimates of asset specific risk across models is likely to be statistically significant or economically material. We will then consider a positive definition of specific risk at both the firm and individual security level based on imposing a no-arbitrage condition on the capital structure of a firm. Once we have a prescriptive estimate of specific risk, we will conclude with a discussion of how conditioning the estimates on alternative information sources such as quantification of text news reports can be used to capture time series variation in the true, but unobservable level of asset specific risk.

Visit **https://northinfoevents.webex.com** to register. There is no charge to register. If you cannot attend the live session, please register and we will send you the post webinar recording.

Webinar Wrap-up: Smart Portfolios
November 20, 2014

Northfield's Jason MacQueen hosted a webinar on November 20th where he discussed the popular "Smart Beta" trend in the investment community. Proponents claim that Smart Beta investment products offer the alpha promise of active managers, without the corresponding drag on performance from fees. However, there are also critics of both the underlying concept and its many implementations.

In the webinar, Jason argues that the real added value to be gained from creating Smart Beta portfolios lies in the methodology used to create the Smart Portfolio, and that this, in turn, is the end result of taking care at each step of the portfolio construction process. The talk covered several US Style strategies, each based on standard Style factors.

The presentation slides are available at **http://www.northinfo.com/documents/631.pdf**. Contact your Northfield Sales Representative if you are interested in viewing the full presentation recording of the event.

Webinar Wrap-up: Measuring Skill in Active Managers
October 1, 2014

Northfield President Dan diBartolomeo hosted a webinar on October 1st where he discussed the effective identification of skill (as opposed to luck) in investment management.

Dan presented the Northfield PWER methodology, a sophisticated multiple step process for statistical analysis of manager skill that Northfield began to develop in 2006. Within this method are approaches to creating effective peer groups, finding optimal evaluation periods, weighting past return observations, and a Bayesian construct for the consideration of luck versus skill.

Dan also showed how "fund of fund" and multi-manager funds can augment PWER scores with the concept of the Effective Information Coefficient. The presentation slides are available at **http://www.northinfo.com/documents/611.pdf**. Contact your Northfield Sales Representative if you are interested in viewing the full presentation recording of the event.

Northfield Staff Profiles

Nick Cutler - Director of Alternative Assets Consulting and Firm-wide Operations

In this position, Nick oversees all asset owner consulting mandates. Assignments include: modeling illiquid assets risk forecasts, integrating alternative assets into same risk framework as marketable securities portfolio and providing deal flow selection analytics. Mr. Cutler also provides firm-wide operational support including sales and marketing oversight. Nick joined Northfield in 2003 and provides over 35 years of experience in money management and private equity.

Prior to Northfield, Nick was a partner and Chief Operations Officer at Darby Investments, Ltd., a global private equity firm based in Washington, DC (sold to Franklin-Templeton Investments in 2003) and prior to Darby, Vice President at Putnam Investments where he shared responsibility for institutional defined benefit and defined contribution consultant relations. Nick received a B.A. from the University of Vermont.

Rick Gold - Senior Risk Analyst

Richard Gold is a senior risk analyst at Northfield focusing on the company's risk modeling for private and public real estate as well as infrastructure and private equity. In addition, he is also responsible for Northfield's Global and U.S. REIT models.

Prior to joining Northfield, Richard was Senior Director-Real Estate Research and Investment Strategy for Grosvenor Americas and Grosvenor Investment Management USA. He was responsible for promoting the company's research perspective both internally and to the company's clients as well as managing new product development.

From 1994 to 2001 he led the Real Estate Equity and Business Applications Modeling Team at Lend Lease Real Estate Investments, with a team that developed both economic and spatially-based (GIS) real estate market and portfolio forecasting models for commercial real estate investment funds. Richard has held senior real estate research positions at Aetna Life & Casualty Co. and Unum Life Insurance. Early in his career, he developed one of the first commercial real estate econometric forecasting models for F.W. Dodge and was a senior regional economist at DRI, one of the nation's foremost economic forecasting companies. He has numerous academic, magazine, and newsletter publications and was an editor of the Journal of Real Estate Research. He has a BA in Political Science from the University of Redlands and Masters Degrees from Ohio University in both International Studies and Economics.

Nick Wade - Asia Region Marketing Director

Nick is the Marketing Director for Asia and is responsible for managing Northfield's operations in that region. As well as managing the sales and marketing effort he manages existing client relationships in the region and plays a key role in many of our global consulting projects.

Previously with Northfield, Nick has been responsible for researching and developing many of our new analytical models, and continues to be actively involved in this area. Various examples of his research are available in the research papers section of Northfield's website.

Prior to joining Northfield he designed risk management systems as a consultant with AMS UK Ltd. and was a Quantitative Analyst with Grantham, Mayo, van Otterloo & Co. Nick holds an honors degree in theoretical physics from the University of York, England, and an MBA from Northeastern University, Boston USA.

Nick serves on the board of the CQA in Asia and is a frequent presenter at industry events. He teaches a quant workshop for the CFA in Singapore, and has also guest lectured at universities including Hitotsubashi, Kyoto University, Monash, RMIT University and Singapore Management University

The Alpha Model/Risk Model Alignment Problem

It has been widely argued to quantitative asset managers that the material impediment to portfolio performance is the "misalignment" between alpha models and risk models. An interesting aspect of this argument is that there is limited simulated evidence that the problem actually exists to a degree that is statistically significant or economically material. It may be of interest to note that the landmark paper on alpha scaling, Grinold (1994), was published with the subtitle "Real Alphas Don't Get Eaten."

Another paper addressing this issue is Stefek and Lee (2008) in which benchmark relative expected return (alpha) is decomposed into factor and residual components using a procedure similar to that proposed in Bulsing, Sefton and Scowcroft (2004). Stefek and Lee argue that if the risk model is complete in the sense that residual returns are uncorrelated, any *residual alpha arising from a common factor has to be an estimation error within the alpha model.* Ceria, Stubbs, Renshaw and Schmieta (2006) come at the problem from the opposite direction, assuming that residual alpha is not an estimation error in the forecast returns *but rather arises from an omitted factor in the risk model.* In both papers, a penalty is introduced into the optimization objective to compensate for the assumed bias. It should be noted that to the extent that the manager's return forecasts are based on security specific (i.e. fundamental) analysis rather than common factors, these methods may detract from returns by compensating for a non-existent bias.

In Ceria, Saxena and Stubbs (2012) empirical data is presented on the usefulness of assuming that the risk model is at fault (systematic risks being treated as residual), and correcting such fault by two different means of augmenting the risk model. They also derive a metric for the degree of "misalignment." One way to think of this issue is that the risk of a given factor may be different for different managers. For example, if we have a P/E factor in our risk model and also in our alpha model we are asserting that we have some ability to predict when the returns associated with the P/E factor will be positive and when those returns will be negative. As such, the uncertainty of the returns of the P/E factor are lower for "us" than for other market participants. However, as noted in Active Portfolio Management by Grinold and Kahn, the reduction in perceived risk due to predictive power is usually very small. If there is 10% correlation between our forecasts and outcomes of the period by period P/E factor return, the variance (risk) associated with the P/E factor declines by 1% which is far too small to be material.

A recent study by Menchero (presented London Quant Group, 2014) showed that customizing a risk model to be consistent with an alpha model can add modestly to the information ratio of a strategy, but that the much larger negative impacts to the information ratio can arise from improperly including an alpha model factor to a risk model. This study also illustrates that both the benefits and risks of aligning the two models become small and generally immaterial in the presence of typical constraints on portfolio construction such as position size limits.

The most crucial point to consider is that "aligning" the alpha and risk model processes may be counter to the intended purpose of a risk model. If we change our risk model to have the same factors as our alpha model, we are creating a situation any estimation errors are likely to be pervasive across both models. This creates the perverse situation that *the risk model will not work well when the alpha model is not working well which defeats the purpose of having the risk model in the first place.* Conversely, the risk model will work well when our alpha model is working well, which is precisely when we don't need the risk model to control risk. *This brings forward the central paradox of active management. All active managers must believe they are going to obtain above average returns, but it should be obvious that roughly half of those beliefs must be wrong.* From the standpoint of the actual investor (rather than the manager) such aggregation of estimation errors is likely to be counterproductive.

Leveraged Index ETFs Leverage Returns to the Underlying Index

ETFs traded on stock market indices have become extremely popular financial instruments providing a low cost way for retail investors to own broadly diversified equity portfolios. An increasing number of ETFs involve more exotic processes like leverage, short positions and so on. For example, one might hold an ETF for a "three times levered S&P 500." The equity portfolio for this security is a vanilla S&P 500 index fund that is intended to track the S&P 500 from day to day, matching period by period arithmetic returns. However, retail investors are generally unaware that such ETFs cannot possibly provide a cumulative return of three times the index return over a prolonged period. The accumulation of wealth in an investment is a function of the geometric mean return. The geometric mean return is roughly equal to arithmetic mean return minus half the variance of the return (the square of the volatility). In an "X times" geared investment, the arithmetic return for the ETF will be "X times" the arithmetic return for the underlying index, but the variance of the returns will be "X squared times" the variance of the underlying index. As such, the geometric mean for the "X times" levered ETFs will always be less than "X times" the geometric mean of the underlying index. Similar arguments can be made for the implicit gearing when short positions are involved. A detailed analysis of this issue was presented in Qian (2012), **http://www.northinfo.com/documents/514.pdf.**

More Frequent Updating of Models is Necessarily Better

It is widely held that investment models should contain all useful information available, and therefore it is necessarily

the case that updating models more frequently is better than updating less frequently. At the conceptual level, there are two important issues to consider. The first is that the broad consensus of evidence is that the distributional properties of security returns are markedly different when viewed at a high frequency (e.g. daily), as compared to lower frequency observations (e.g. monthly). Implicit in the typical application of portfolio theory is that security returns can be described as a "random walk" (geometric Brownian motion) with normal distributions, consistent volatility and no serial correlation. An enormous literature summarized in diBartolomeo (2007) shows conclusively that these attributes for the process would be uniformly rejected in empirical testing. Observing returns more frequently may give us more raw information but without suitability to the general purpose to which the information will routinely be put.

The second is that in the context of risk models, there are many obvious examples of where higher frequency observations cannot clearly add any more information. For example, consider fundamental factor models with factors like P/E, P/B or dividend yield. Given that in no country are the accounting variables like earnings updated more often than quarterly (and often as rarely as annually), daily time series variation in such factor exposures is merely a manifestation of price changes, so our factor model is a noisy tautology. We are explaining security returns with security returns. A simple price momentum variable, already existent in most such models carries the relevant information. By over-fitting, we both reduce the stability of the risk forecasts and potentially incur trading costs to adjust the portfolio for what is actually random noise. For more "top down" models it should be intuitive to see that the factor exposure of something like ExxonMobil to oil prices is unlikely to change materially from day to day, and there is something intrinsically wrong with the models if such changes were observed.

When dealing with short horizon risk forecasts, over a day or a week it is clear that risk models should reflect all material information that can be obtained. For example, if the CEO of a company was just killed in a plane crash, that will certainly have relevance to the idiosyncratic risk of their stock. Similarly, macroeconomic events such as the recent rapid decline in energy prices will have pervasive effects on the behavior of many firms. Two approaches to this issue are described in diBartolomeo and Warrick (2005) and diBartolomeo, Mitra and Mitra (2009). In related work, Renshaw (2008) tries to address the issue of "staleness" of risk models but with mixed results. His results show that estimated risk levels will necessarily move more when estimated more frequently (obviously if you don't change the model, the risk estimates don't change). However preponderance of the weekly change in estimated risk in the chosen sample period (during the GFC) arose from changes in the factor covariance matrix. Contradictory influences for changes in factor exposures are illustrated in Figures 1 and 2 of the Renshaw paper.

Northfield to acquire the asset management risk model business of R-Squared Risk

Northfield Information Services, Inc. is pleased to announce a final agreement with R-Squared Risk Management Ltd. (UK) to acquire the asset management risk model business of R-Squared. The consolidation of activities will include all rights and related intellectual property for the R-Squared business line of multi-factor risk models, client customized risk models, and the PRISM analytical software application. The transaction is expected to close December 30th.

R-Squared will remain a separate legal entity, and will continue to provide consulting to asset management firms on investment strategies. Founder and industry pioneer Jason MacQueen, and several other senior staff members of R-Squared will be devoting the preponderance of their time to Northfield related matters. The integration of the richly experienced R-Squared staff with the already deep Northfield team creates an organization of unprecedented skill and tenure in the risk management and portfolio construction aspects of the asset management process. It is expected that Jason and the other R-Squared staff will also take key roles in Northfield's ongoing empirical research, and our client education program of seminars.

This combination will have immediate benefits for clients of both firms. For Northfield clients, there will be access to an ever-broader range of perspectives coming from competently constructed analytical models of portfolio risk, and risk reporting and attribution analysis available within the PRISM application. The addition of the R-Squared team will also provide Northfield with the additional personnel depth to offer risk model customization and a broader range of bespoke quantitative research. The clients of R-Squared will benefit from access to Northfield's sophisticated optimization capabilities, a broad range of both single asset class and multi-asset class risk models, trading cost analytics, and a 24 hour a day global support operation.

For further information, please contact your local Northfield Sales Representative.

Arun Soni Joins Northfield

As part of the consolidation of the R-Squared risk business line, Arun Soni will be joining the Europe/Middle East sales effort from our London office. Arun's quantitative experience with investment firms such as Morgan Stanley, Commerzbank and Fidelity Investments have honed an acute understanding of the investment process, while roles with R-squared, MSCI and Axioma give him a unique perspective on client needs.

Arun can be reached in our London Office, +44 (0) 20 3714 4130, asoni@northinfo.com.

# Technical Support Tip: Northfield Excel Add-in
By James Williams

With the December 2104 model update (to be released in early January 2015), an updated excel add-in will be provided in the Northfield Investment Suite. The updated add-in, Northfield.xla will replace the current add-ins (northfield.xla and northfieldbatch.xla). The new add-in has been improved to provide more stability, compatibility with Excel 2007 and later as well as a feature that allows the add-in to be called from VBA. The add-in will be installed automatically and overwrite the existing add-in when users download the nissuiteYYYYMMDD.exe file, run WebInstall or LiveUpdate.

Excel add-in Background

Since 2006, Northfield has provided an Excel add-in that allows users to run risk analysis and "what if" scenario analysis quickly and easily without leaving the familiar Excel environment. Recent improvements include the ability to automate the Excel add-in; which makes scheduling risk analysis possible. This technical support tip will discuss the Excel add-in capabilities in general and more specifically the automation feature.

Once installed, the Excel add-in is added to the ADD-INS tab from the Excel Ribbon. Selecting the "Nfield" icon expands the list of menu options available as seen below:
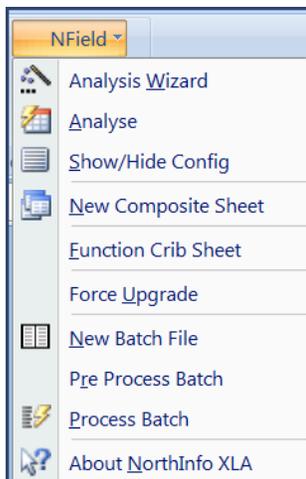
Key Benefits of using the Excel Add-in

- Excel interface for portfolio and benchmark holdings
- Ability to use data links from external sources to populate holdings and price data.
- Composite asset utility to create fund-of-funds, ETF holdings, stock index derivate composites, etc.
- Output reports consistent to what is produced by the Northfield Open Optimizer
- Batching reporting capability to support multi-portfolio and/or multi-model risk reporting, time series risk analysis.
- Automation of risk analysis via VBA code.

Holdings Data

Holdings data is entered in table format within a single worksheet or across worksheets (separate sheet for portfolio, benchmark, industry, and sector). **Screenshot 1** shows the portfolio holdings (GLB_Account001), benchmark data (GLB_Benchmark), composite asset (ETF_EM_Composite) and industry and sector tables (Industry_&_Sector_Table) all created in separate worksheets. The industry and sector data can also be accessed from separate files instead of being created in the same workbook as the other holdings data.

An advantage of using the Excel add-in is that ability to link all or some input data from outside sources. For example, users may have a link to FactSet, Bloomberg or other 3rd party applications that automatically updates holdings data or price information.

Composite assets **(screenshot 2 at the top of the next page)** can easily be created within the add-in and the risk of the underlying assets will be properly evaluated as done within the Northfield Open Optimizer.

Screenshot 1

	A	B	C	D	E	F	G	H	I	J
1	ID	Name	Weight	Price	Industry ID	Shares			Portfolio Name	Global_Account_001
2	AAPL	Apple Inc	2.7399245	118.93	s3-c29	115,191				
3	*$$$	US Dollar	2.4821309	1	CASH	12,410,654			Portfolio Value	$ 500,000,000
4	MSFT	Microsoft Corp	1.9574067	47.81	s3-c29	204,707				
5	GE	General Electric Co	1.9188067	26.49	s1-c29	362,176				
6	XOM	Exxon Mobil Corp	1.8063346	90.54	s6-c29	99,753				
7	JPM	JPMorgan Chase & Co	1.6358337	60.16	s4-c29	135,957				
22	7103065	Novartis AG	1.0684035	97.0413	s7-c27	55,049				
23	6900643	Toyota Motor Corp	1.0245215	61.6253	s1-c15	83,125				
24	7110388	Roche Holding AG	1.0181466	300.361	s7-c27	16,949				

GLB_Account001 / GLB_Benchmark / ETF_EM_Composite / Industry_&_Sector_Table

Screenshot 2

User Configuration Information	Complete as appropriate
Long Name	Emerging Market ETF
Short Name / ID	ETF_EM
Industry ID	ETF
Price	25
Market Cap	7530297.12
Holding Type	Percent

ID	Name	Price	Shares	Weight	Industry
BMMV2K8	TENCENT	15.9896	9367.33877	2.081977551	s3-c12
BC9ZH86	RICHTER GEDEON N	15.6063	186.3747333	0.086977551	s7-c41
6073556	China Mobile Ltd	12.321	20389.65993	1.847977551	s3-c12
6889106	TSMC	4.57226	25929.6278	1.659977551	s3-c31
B0LMTQ3	CCB-H	0.75822	240417.0294	1.547977551	s4-c39
B1G1QD3	ICBC-H	0.67827	86794.04957	1.374977551	s4-c39
TSM	TAIWAN SEMIC-ADR	23.47	5185.726459	1.318977551	s3-c29

Output Reports

There are five output reports created by the Excel add-in risk analysis process. The output can be saved in the existing workbook or saved to a separate Excel workbook. The reports are similar to what is produced in the Northfield Open Optimizer and are provided for each type of risk model selected; Long Term, Short Term (biweekly near horizon adaptive model), Blended.

• **Summary Report** - Tracking Error, Security Specific and Factor Risk, Total Risk, Portfolio beta and liquidity adjusted risk. The report also includes some VaR numbers, calculated simply from total risk, and a summary of any exceptions found.

• **Exceptions** - Any missing securities, with their name and weight, found in the portfolio, benchmark or composite assets.

• **Risk** - This is similar to the risk decomposition report in the Northfield Open Optimizer. It also lists the top 5 and bottom 5 risk factors by percent of variance contribution.

• **Stock** - shows the stock specific risk information for each security in the portfolio, as in the Stock Marginal Contribution report in Open Optimizer.

• **Penalties** - the weight in each of the industries and sectors used – Northfield or user-defined.

• **Main Table** - this contains all the underlying data about each security represented in both the portfolio and the benchmark – exactly as seen in the Open Optimizer.

(Screenshot 3 is an example of the summary output report)

Screenshot 3

NORTHFIELD modeling financial markets worldwide

Portfolio: Global_Account_001 : Benchmark: Global_Benchmark : Report Created 13-Dec-2014 00:40:34

Number of unrecognized stocks in the portfolio:	0
Number of unrecognized stocks in the benchmark:	0
Number of unrecognized stocks in composite assets:	0

Percent unrecognised in Portfolio	0
Percent unrecognised in Benchmark	0

Summary Information

Factor Tracking Variance	1.5884
Stock Specific Tracking Variance	1.0717
Total Tracking Variance	2.6601
Tracking Error	1.6310
% of Tracking Variance Factor Related/Systematic	59.71%
% of Tracking Variance Stock Specific	40.29%
Active Risk	1.97
Total Risk of Portfolio	13.1363
Total Risk of Benchmark	12.0796
R-Squared	0.9903

Portfolio Beta	1.082190941

(Tech Tip, continued from page 8)

Batch Reporting

The Excel add-in can also be run as a batch process for a number of different objectives such as the regular risk analysis of multiple portfolios, what-if scenario tests, comparison of different risk models and time-series risk analysis to name a few.

Screenshot 4 below shows an example of six portfolios being compared with the Long Term Northfield Global risk model as well as with the blending (20% blending of the short horizon and long horizon versions) of the Northfield global risk model.

The batch analysis output **(Screenshot 5)** shows top-level risk statistics for a quick comparison of the risk across portfolios. The "Term" column describes the model horizon period being used: LT for the 12 month time horizon, ST for the bi-weekly (10 trading day) time horizon and BL for blending of both the LT and ST time horizon models.

VBA integration Batch Automation

The "Function Crib Sheet" icon in the Northfield add-in menu provides a sheet with a list of functions that can guide VB developers in automating the execution of the add-in from their own code, for full integration within Excel. In addition the following line can be added to VBA code to automate the production of the batch process:

sResult = Application.Run("Northfield.xla! RunProcessBatch", sBatchFile)

The optional parameter sBatchFile is the full path/name of a valid Batch File sheet. If you do not pass this parameter, this function will attempt to process the active sheet as if it is a batch file sheet. If you do pass the parameter the function will open the file name passed, process it and then close it, saving any changes. Do not pass the name of an open file – this will not work. If you do not pass the parameter then the active sheet will be processed (if possible) but not saved or closed.

Screenshot 4

Output in this File?		**YES**		Last Run Date						
Output File Name:										
Nisopt Run0 Path and FileName:		**c:\northinfo\nisopt\run0.exe**								

Reference	Path	FileName	Include?	Long Term?	Short Term?	Blended?	Blend Date	Blend Percent	Use EOM Files?
Global_Model_Sample_1	C:\NorthInfo\Nisopt\Samples\Global_Model\	Global_Model_ExcelAddIn_Sample_1.xlsx	Y	Y	N	Y	20141130	20	Y
Global_Model_Sample_2	C:\NorthInfo\Nisopt\Samples\Global_Model\	Global_Model_ExcelAddIn_Sample_2.xlsx	Y	Y	N	Y	20141130	20	Y
Global_Model_Sample_3	C:\NorthInfo\Nisopt\Samples\Global_Model\	Global_Model_ExcelAddIn_Sample_3.xlsx	Y	Y	N	Y	20141130	20	Y
Global_Model_Sample_4	C:\NorthInfo\Nisopt\Samples\Global_Model\	Global_Model_ExcelAddIn_Sample_4.xlsx	Y	Y	N	Y	20141130	40	Y
Global_Model_Sample_5	C:\NorthInfo\Nisopt\Samples\Global_Model\	Global_Model_ExcelAddIn_Sample_5.xlsx	Y	Y	N	Y	20141130	20	Y
Global_Model_Sample_6	C:\NorthInfo\Nisopt\Samples\Global_Model\	Global_Model_ExcelAddIn_Sample_6.xlsx	Y	Y	N	Y	20141130	50	Y

Screenshot 5

Batch Processor Report Created 13-Dec-2014 00:40

Reference	Portfolio Name	Benchmark Name	Term	Tracking Variance			Tracking Error	% Tracking Variance		Active Risk	Total Risk		R-Squared	Portfolio Beta
				Factor	Stock Specific	Total		Factor Related	Stock Specific		Portfolio	Benchmark		
Global_Model_Sample_1	Global_Account_001	Global_Benchmark	LT	1.59	1.07	2.66	1.63	60%	40%	1.97	13.14	12.08	0.99	1.08
Global_Model_Sample_1	Global_Account_001	Global_Benchmark	BL	1.55	1.09	2.64	1.62	59%	41%	1.96	12.92	11.89	0.99	1.08
Global_Model_Sample_2	Global_Account_002	Global_Benchmark	LT	4.46	2.89	7.35	2.71	61%	39%	3.27	14.10	12.08	0.98	1.16
Global_Model_Sample_2	Global_Account_002	Global_Benchmark	BL	4.35	2.93	7.29	2.70	60%	40%	3.26	13.88	11.89	0.98	1.16
Global_Model_Sample_3	Global_Account_003	Global_Benchmark	LT	3.86	7.32	11.18	3.34	35%	65%	4.04	10.96	12.08	0.93	0.87
Global_Model_Sample_3	Global_Account_003	Global_Benchmark	BL	3.85	7.42	11.27	3.36	34%	66%	4.05	10.78	11.89	0.92	0.87
Global_Model_Sample_4	Global_Account_004	Global_Benchmark	LT	4.93	11.31	16.24	4.03	30%	70%	4.87	14.53	12.08	0.94	1.17
Global_Model_Sample_4	Global_Account_004	Global_Benchmark	BL	4.68	11.65	16.33	4.04	29%	71%	4.88	14.08	11.69	0.94	1.17
Global_Model_Sample_5	Global_Account_005	Global_Benchmark	LT	8.45	2.66	11.11	3.33	76%	24%	4.02	9.87	12.08	0.95	0.80
Global_Model_Sample_5	Global_Account_005	Global_Benchmark	BL	8.21	2.70	10.91	3.30	75%	25%	3.99	9.73	11.89	0.95	0.80
Global_Model_Sample_6	Global_Account_006	Global_Benchmark	LT	2.31	20.88	23.19	4.82	10%	90%	5.81	4.82	-	-	-
Global_Model_Sample_6	Global_Account_006	Global_Benchmark	BL	2.61	21.60	24.21	4.92	11%	89%	5.94	4.92	-	-	-

(Tech Tip, Continued from page 9)

The function returns a string which contains output and/or error messages. This will always be non-zero in length. For example, the batch process can be called from a macro that is scheduled to run at a certain time of day/night and when activated, will produce the batch summary report and automatically send out an email with an Excel attachment of the batch summary report.

We hope that this article has provided some insight into the capabilities of the Excel add-in. This tool is very user friendly and works quite well with numerous portfolios and can also run time series and multi-model risk analysis without a lot of setup required. Examples of the Excel add-in will be provided for the Northfield risk models and can be found in the **\\…Northinfo\Nisopt\Samples** folder.

In addition, updated documentation will be available in the **\\...NorthInfo\Nisopt\Doc\English** folder.

Technical Support in Boston can be reached at: 617.208.2080, **support@northinfo.com.** European clients can contact: **support-europe@northinfo.com** or call +44 (0) 17 2244 RISK. In Asia, call +81(0)3 5403 4655 or +61(0)2 9238 4284 or **support-asia@northinfo.com.**

Staff Speaking Engagements

Northfield President Dan diBartolomeo and Attilio Meucci will be presenting at the Society of Actuaries Investment Symposium in Philadelphia on March 26th. The topic will be "Identifying Regime Distributions with Flexible Probabilities."

Northfield's Chris Kantos presented "Incorporation of Text News into Security Risk Estimates" at the Pittsburg QWAFAFEW meeting on December 9th.

Northfield's Emilian Belev presented "A Structural Model of Sovereign Credit and Bank Risk," on September 10th, at the Boston Economic Club meeting, in Boston.

Emilian presented "Integrating Physical Real Estate and Infrastructure Assets In Enterprise Risk Management" at the International Enterprise Risk Management Symposium in Chicago on September 30th.

New Northfield Partner

Murex and Northfield have joined forces to offer an enriched risk management offering to the Buy-Side. This preferred partnership will enable investment professionals to natively access Northfield risk models and portfolio construction tools from the MX.3 platform. This enriched portfolio management solution will be available worldwide to asset managers, hedge funds, pension funds, insurance companies and private banks.

The integration of Northfield products is an attractive solution to those clients that want their portfolio analytics and rebalancing capabilities integrated into a single platform which provides the front, middle and back office functions required to support their business. This partnership enables them to choose from a broad palette of risk models and optimization tools to constantly keep on top of new challenges and new regulatory requirements.

The result is a platform that simplifies the data management needed in order to perform analyses that add value at various stages of the investment management process. Please contact Northfield sales at **NISSales@northinfo.com** or Murex sales at **info@murex.com** for more details.

New Bundling Options for Clients

Northfield offers clients a variety of options to bundle risk models for the same base price. For those qualifying clients, you can now bundle the US Fundamental Model, your choice of the US Macroeconomic Model or the US Single Market model, and our monthly Transaction Cost model for the base fee. In addition, we will provide access to the daily updated "Near Horizon" versions of the selected models at no additional cost. The Near Horizon version of the models focus on a forward risk horizon of ten trading days, as compared to the regular models that operate with a forecasting horizon of one year. To see if you qualify for these options, please contact your Northfield sales representative at **NISSales@northinfo.com**, 617.208.2050, to learn more.