September 2015

Northfield News

A Newsletter for the Friends and Clients of Northfield

Too Big to Fail or Too Complex to Run?

By Dan diBartolomeo

During the period of the recent Global Financial Crisis (2007-2009) the phrase "too big to fail" became a prominent part of the public and professional discourse. The debate centered around whether a certain set of private financial institutions were so pervasively important to the international economy that governments had no choice but to provide massive financial rescues to prevent failures. In the subsequent years, various public policy and regulatory changes have been undertaken within specific countries such as the USA and United Kingdom, and internationally as well (e.g. revisions to Basel accords). Most of these efforts have focused around commercial banking.

We would assert that the steps taken to address "too big to fail" have left out the most important element of all necessary to enhancing stability of global financial markets. Our argument is that the precarious levels of systemic risk that led to the GFC are the joint product of both the size of financial institutions, and the complexity of their operations.

There were many financial institutions around the world (e.g. the retail savings bank operation of the Japanese Post Office) that were utterly uninvolved in the crisis despite the enormous size of their balance sheets. For many such entities, "too big to fail" was not much of a concern because their operations were sufficiently simple and transparent that risks associated with global financial markets were easily understood, and accounted for by management. In many other cases, "too big to fail" was a conceptual and semantic proxy for "too complex to run." Since the GFC Northfield has been reviewing how analytical tools for portfolio management can be redefined to meet the needs of ultra-complex entities.

Let us consider the case of AIG, the organization that many people consider the very nexus of the crisis. What most people fail to realize is the incredible complexity of running a large multi-line insurance company. At least in terms of this dimension, AIG was the top (or perhaps bottom) of the league table with more than *five thousand* separate corporate divisions. The "financial products" division of AIG that was the center of their financial woes was just one of many thousands of operating units.

In fairness, it should be noted that the byzantine nature of AIG and other large global insurance entities is largely the result of differences in the way insurance companies are regulated. Unlike global banking where international agreements (e.g. Basel) have brought about some level of uniformity in financial structure and legal process, regulation of the insurance companies is an extremely disjointed affair, with each country being an independent case. Many "wholesale" insurance entities such as re-insurers have located to jurisdictions like Bermuda, and the British Virgin Islands where regulation is perceived as conducive, and taxes are low (or non-existent).

Within the USA, the situation is even more extreme as there is minimal regulation of in-

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Special Points of Interest:

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Inside This Issue:

Recent and Upcoming Events

2015 Northfield Annual Research Conference

Loews Don CeSar Hotel • St. Pete Beach, Florida • October 29 - November 1, 2015

We are pleased to announce our 28th annual research conference at the Loews Don CeSar Hotel, in St. Pete Beach, Florida. The conference will officially start on Thursday, October 29th and end on Sunday, November 1st.

Loews Don CeSar Hotel

The Don CeSar is located on the beach on St Pete's! The beach is located steps from the hotel; warm breezes, tranquil ocean and speculator water views make the Don, as it is called by locals, a unique selection for this year's conference.

To complete your online registration and to view the full agenda with detailed presentation abstracts, visit **http://www.northinfo.com/events.php**. We are accepting online registrations only, but contact Kathy Prasad if you have any difficulties registering, **kathy@northinfo.com**, 617.208.2020. All hotel reservations are to be made directly by calling the Don CeSar Hotel, or by visiting their registration website at **https://aws.passkey.com/g/51887329**.

Agenda

The agenda will consist of twelve 1-hour presentations. The CFA Institute has approved this program for 12 CE credit hours. If you are a CFA Institute member, CE credit for your participation in this program will be automatically recorded in your CE tracking tool.

Weathered for Climate Risk (Forthcoming in Financial Analyst Journal)
Marielle de Jong, Amundi

Managing Equity Portfolios with Tax Efficiency
Vladimir de Vassal, CFA, Glenmede Investment Management

The Triumph of Mediocrity: A Case Study of "Naïve Beta"
Edward Qian, Panagora Asset Management

Optimal Deal Flow for Illiquid Assets (Winner of the American Real Estate Society Best Practitioner Paper for 2015)
Emilian Belev and Richard Gold, Northfield

Is It Worth It? Assessing the Value of Risk Managed Investing
Jerry Miccolis, Giralda Advisors

Can Financial Engineering Cure Cancer?
Roger Stein, MIT

Optimizing Value (Forthcoming in *The Journal of Portfolio Management*)
Lisa Goldberg, Aperio

Trading Cost Models Across Multiple Asset Classes and Their Use in Investment Decisions
Robert Kissell, Kissell Research

What's Next for Retail Asset Management?
Barry Feldman, IMCI

Retirement Income Plus for the Individual Investor
John O'Brien, University of California at Berkeley

Modified IR as Predictor of Fund Performance
Joshua Livnat, New York University

Risk Model Testing, or Horses for Courses
Jason MacQueen, Northfield

Northfield Asia Seminar Series – Research on Investment Management and Risk

Hong Kong • Sydney • Singapore • November 6th, 10th and 16st

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

To register, visit **http://www.northinfo.com/events.php,** or contact Nick Wade in Tokyo if you would like to attend, **+81.3.5403.4655** or e-mail: **events@northinfo.com**. There is no cost for registering for any of the seminars.

The seminars are pending approval for CFA CE units at the time of this writing.

Venues

Singapore:

Friday, November 6, 2015, 9:00 am - 4:00 pm • The Fullerton Hotel, Singapore

Sydney:

Tuesday, November 10, 2015, 9:00 am – 4:00 pm • The Quay Restaurant, The Rocks, Sydney

Hong Kong:

Monday, November 16, 2015, 9:00 am - 4:00 pm • Landmark Mandarin Oriental, Central, Hong Kong

Agenda

The agenda for all three events will consist of six 1-hour presentations by Northfield's Dan diBartolomeo, Jason MacQueen and Nick Wade.

- Risk Systems That Read - Presented by Dan diBartolomeo
- The Choice of Model Factors under Multiple Definitions of Risk - Presented by Dan diBartolomeo
- Behavioral Aspects of Risk - Presented by Dan diBartolomeo
- Optimal Deal Flow for Illiquid Asset - Presented by Nick Wade
- Why Doesn't Skill = Outperformance? - Presented by Jason MacQueen
- Smart Portfolios - Presented by Jason MacQueen

To view the full agendas with detailed presentation abstracts visit **www.northinfo.com/events.php**

Quay Restaurant

Landmark Mandarin Oriental

Fullerton Hotel

Webinar - Behavioral Aspects of Risk

September 29, 2015 • 11:00 AM EDT

Northfield President Dan diBartolomeo will be hosting a webinar on September 29, 2015.

Abstract

Since the early work of Daniel Bernoulli in 1740, it has been widely acknowledged that investors generally do not like risk, but they are largely ineffective at describing how financial risk should actually be defined. In this presentation, we will begin with a philosophical and semantic discussion of what risk is and how investors talk about it. We will then move on to a review of plausible investor utility functions so as to have a context from which to distinguish what seems to be very sensible behavior by investors in response to investment risk, from apparently irrational behavior. The remainder of the presentation will focus on high level behavioral aspects of risk, and how the many seemingly bizarre behaviors arise from investors and managers trying to give the appearance of good risk management, as opposed to the reality of good risk management. Once this distinction is clear, we see that the attitudes which drive investor behavior regarding risk often range from "willful ignorance" to "delusion." Many regulatory schemes around the world also reinforce the irrational behavior, as risk regulations intended for commercial banking have been poorly revised for asset managers and asset owners.

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: Risk Model Testing and Regulatory Reporting

August 27, 2015 • 11:00 AM EDT

Northfield President Dan diBartolomeo hosted a webinar on Thursday, August 27th where he discussed how the Increasing regulation of non-bank financial institutions such as asset managers and pension funds, has brought many requests from clients on how to test the efficiency of the risk models they use, and how to report this information to regulatory agencies. The presentation described several different methods for evaluating the predictive power of risk models over different time horizons in the context of "model risk" as described in US Federal Reserve SR 11-7 and related UCITS requirements.

The presentation slides are available at **http://www.northinfo.com/documents/657.pdf**. Contact your Northfield Sales Representative if you are interested in viewing the full presentation recording of the event.

Webinar Wrap-up: Diversification and Real Estate, Part I

July 28, 2015 • 11:00 AM EDT

Northfield's Rick Gold and Emilian Belev hosted a webinar on Tuesday, July 28th where they discussed Private Equity Real Estate and how the reliance on appraisal-based indexes has served to propagate the myth that the asset class offers superior diversification properties. The first half of the discussion used data from two index providers to show how Private Equity Real Estate relates to the performance of other asset classes. The second half of the presentation examined the implications of the findings that show how real estate is less of a diversifier than claimed by index-based methodology proponents.

The presentation slides are available at **http://www.northinfo.com/documents/656.pdf**. Contact your Northfield Sales Representative if you are interested in viewing the full presentation recording of the event.

Webinar Wrap-up: Assessment of Corporate Credit and Counterparty Risk Using News Flow and Sentiment

June 30, 2015 • 11:00 AM EDT

Northfield President Dan diBartolomeo hosted a webinar on Tuesday, June 30th where he discussed how the Global Financial Crisis of 2007-2009 greatly reduced institutional confidence in the traditional credit rating agencies. The presentation offered an alternative to the traditional rating process by illustrating Northfield's proprietary RISK SYSTEMS THAT READ℠ process of news flow and sentiment statistics which calibrate and update the credit risk of corporations and financial institutions in real time.

The presentation slides are available at **http://www.northinfo.com/documents/654.pdf**. Contact your Northfield Sales Representative if you are interested in viewing the full presentation recording of the event.

Northfield Staff Profiles

Richard Pearce - Client Relations - North America Region

Richard has been with Northfield in Boston since 1997, maintaining North American client relationships and promoting products and services to new prospects.

Richard first worked as an investment analyst for a London stockbroker, followed by a portfolio management position at the Bank of Bermuda. Prior to joining Northfield, Richard worked as marketing director for Irwin Tepper Associates, a Boston firm specializing in defined benefit asset/liability analysis.

Richard holds an honors degree in Mathematics from the University of Kent, England. He also holds the diploma in Finance and Investment from the Institute of Actuaries, London, as well as the UK equivalent of the CFA qualification.

Arun Soni - Client Relations - EMEA Region

Arun's investment management experience spans roles in quantitative equity research at Morgan Stanley (UK) Ltd. in London, UK and at Commerzbank Asset Management in Frankfurt, Germany. His primary expertise was in the construction of stock selection models as well as in the development and maintenance of the data and systems infrastructure of the quantitative research team.

He then co-founded a technology venture that leveraged India's large pool of IT savvy specialists to provide offshore technology services to clients in North America and Europe.

Subsequently, Arun has acquired significant experience in sales and relationship management with leading providers of portfolio risk management solutions (MSCI Barra & Axioma) and financial data vendors (Standard & Poor's). Arun is highly entrepreneurial and follows a consultative approach for business development that draws heavily on his experiences in quantitative equity research and technology services.

Arun holds a Master of Science in Finance and a Bachelor of Science in Accounting.

James Williams - Client Training and Support Consultant – Asia Pacific Region

James Williams joined Northfield's Asia office in August 2007 and is responsible for supporting and training clients on Northfield's range of risk models as well as risk analysis, optimization and investment performance services. In addition, he works closely with the regional offices of Northfield's partner companies in managing support issues of mutual clients and delivering presentations on new risk model developments.

Prior to joining Northfield, he held client support roles with the Japan office of the quantitative modeling firm Starmine Inc. (sold to Thomson Reuters in 2007), as well as with the financial data department of NIKKEI Inc. in New York City. He has also worked as a Series 7 & 63 licensed financial advisor with Raymond James Financial, Inc. and on the equity research sales desk of the NYC branch of Schroder & Co. Inc.

A graduate of the University of Southern California with a B.A. in East Asian Studies & Political Science, James also holds a M.B.A. degree in Finance & Corporate Accounting from the William E. Simon Graduate School of Business at the University of Rochester. James is a member of the CFA Institute and local CFA Society in Japan.

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surance companies at the federal level. Instead, each of the fifty states has their own regulatory system of rules and requirements some of which are much tougher than others. For example, it is widely believed that Connecticut is home to a very large insurance industry because many companies found the regulatory and tax regimes in the traditional financial center of New York not to their liking.

To further compound the difficulty, each type of insurance line (life, annuity, property, automobile, etc.) may have much more heterogeneous regulatory requirements for things like capital reserves than would a bank that chose to make home mortgages, credit cards and auto loans. Often each separate line of insurance in each separate jurisdiction is incorporated as a legally distinct entity, leading to situations like AIG with thousands of legal entities. As companies create financial innovations like credit default swaps, there simply were no regulations in many jurisdictions. Most swap transactions had previously been explicitly exempted from regulation at the US federal level. These entities are also domiciled separately meaning that the payment of taxes may involve adherence to hundreds of different tax regimes that vary from country to country, and state to state. Insurers have large incentives to endure complexity so as to locate various business units here regulation is most favorable.

In such an environment it is not difficult to imagine that there is the potential for things to "fall through the cracks." In a presentation at the 2014 Northfield client conference, the then AIG chief investment officer stated that only about one hundred fifty credit default swap transactions caused the massive losses that destabilized the firm, and required the massive rescue by the US government. He went on to describe the management and procedural changes at AIG that led to a strong turnaround at the firm. In the end, the US government exited the AIG rescue with a profit of more than $20 Billion. Ironically, the lovely hotel and ski resort where the conference took place remain holdings in the AIG real estate portfolio.

While the systemic risks associated with "too complex to run" seem to have eluded the decentralized regulatory environment, investors seem to have been taking notice all along. In diBartolomeo (*Journal of Investing*, 2010) an analytical model is presented to assess bankruptcy risk, as a "market implied expected life" of the firm. When credit ratings based on this method were constructed back to 1992, it was noticeable that as early as 2004 AIG's expectation of survival time was below the median for financial institutions despite the fact that it then held a AAA rating from the major rating agencies. A closely related method is used by Northfield to assess credit risk of corporate bonds, counterparty risk and some sovereign credit risk.

Northfield has three areas of work that are intended to address the massive complexity of these organizations. The first is our "Everything, Everywhere" multi-asset class factor model that has been available since 2001. Over the years, we have created extensions of the model that allow for the *risk characteristics of all assets across a complex organization to be examined in a single, coherent factor structure.* For the first time, large entities can look at their entire financial exposure to risk across equities, bonds, structured fixed income, derivatives and illiquid assets such as real estate and infrastructure financing. As risk is always in the future, the model allows the risk forecast to be done over time horizons as short as ten days, or as long as one year. A companion "bootstrap simulation" tool can be used to extend the analysis even further into the future.

Our second effort in this area was the creation of the MARS-ERM analytical application. This relatively new application allows a large firm to carry out risk management tasks at various levels of aggregation across thousands of business unit level portfolios of both assets and liabilities. In concept, MARS-ERM was adapted from the original MARS application which is used by numerous large asset managers as their basic operational platform for their private wealth practices. In some ways, having five thousand different investment portfolios for five thousand business units is quite similar to wealth management where a single team may manage portfolio wealth for tens of thousands of separate households.

The third effort is another parallel to the private wealth world. In private wealth, one of today's popular concepts is "householding" wherein multiple portfolios held by different family members are analytically joined together so that the aggregate portfolio is optimal for the family as a whole. For example, a single family might have both taxable and tax deferred portfolios (e.g. 401K retirement). In addition, different family members such as parents might have very different levels of risk tolerance, liquidity needs, tax circumstances, and legacy portfolios.

We can think of optimizing a large set of divisional portfolios for a complex insurance entity as a giant version of the "householding" problem. We first presented an analytical approach to this problem in our May 2005 newsletter, **http://www.northinfo.com/documents/133.pdf**. In this method, we were also very careful to have means to address the "wash sale" problem for related securities or among related parties. When considering a complex corporate entity as a household, the problem is computationally larger but still very tractable with modern computers. The key to understanding the approach is that our optimization software allows for multiple instances of an "almost identical security." For example, we can not only define a security such as IBM shares, we can separately define IBM shares held

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Tech Tip: Model Testing and Validation

By Steve Dyer and Dan diBartolomeo

The Northfield support desk has received an increasing volume of requests for model testing and validation analytics, which we are happy to provide to clients by request. One of the motivating forces behind these requests has been regulatory compliance, or external directives like SR 11-7 from the Federal Reserve, *Guidance on Risk Management*.[1] In particular, this directive advises the following step in the model validation process:

"*Outcomes Analysis*. This step involves comparing model outputs to corresponding actual outcomes. Back-testing is one form of outcomes analysis that involves the comparison of actual outcomes with model forecasts during a sample time period not used in model development at a frequency that matches the model's forecast horizon or performance window."

What follows is an example of the testing and reporting that Northfield can provide for your model validation process.

In general, there are no particular magnitudes of output values that are "good" or "acceptable." By defining the parameters of the test in different ways, we can make the output numbers more or less favorable. For example, the predictive results in a US model would look a lot better if we limited the universe to the S&P 500, as opposed to including lots of random, small firms that the model construction process isn't specifically tailored to. Similarly, using only capitalization weighted portfolios and benchmarks emphasizes large firms, which might be sensible in a "long only" portfolio with a traditional benchmark but less appropriate to a long/short portfolio with a cash benchmark. In the example data in **Table 1**, 100 portfolios and benchmarks between 30 and 230 assets were created by random selection from the universe of 230 securities in the US REIT model, and tested for the 12 month period ending 30 June 2015. The portfolios and benchmarks were randomly assigned to be equal weighted or capitalization weighted.

At Northfield, we assume our models are being used by asset managers, and that the risk values are expressed in annual units because users are actually interested risk magnitudes in the year-ahead. We think this makes sense because portfolio turnover in a typical institutional equity account is typically much closer to 100% per year than 100% per month or 100% per week. The models have an explicit one year forecast period, so we compare the initial risk forecast from the model to what actually happened over the following year, since model tests should reflect the investment style and horizon being implemented.

Correlation between predicted and actual risk	Tracking Error	Portfolio Risk	Benchmark Risk
Average Realized	3.08	14.23	14.42
Average Predicted	3.79	11.82	12
Average Initial	3.95	11.8	12.05
Correlation Realized to Initial	0.82	0.64	0.59
Correlation Realized to Average	0.84	0.67	0.64
Standard Error Correlation (Initial)	0.03	0.06	0.06
T Statistic of Initial	27.46	12.14	10.69
% Bias	22.97	-16.79	-16.46
Confidence	0.79	0.72	0.89
% Confidence	20.85	6.09	7.38
Residual Normality Test			
Average Monthly Residual Mean for next 12 months	0.02	0.156	0.147
Average Monthly Residual for next 12 months	0.832	1.125	1.123
Exceedance Risk			
Expected exceedence 95%			
Percent passing exceedance test for	99%	100%	99%
Percent passing exceedance test for	100%	100%	100%

* using a T distribution with 5 degrees of freedom

Table 1. Results for 100 randomized portfolios and benchmarks for the 12 months ending 30 June 2015 using the Northfield US REIT model.

We have implemented three basic concepts to test if a model works:

1) **Cross sectional discrimination.** If we have a large set of portfolios (e.g. 250), can we predict which portfolios are low risk and which are high risk? We believe this is the key metric for practical use in asset management because managers are normally constrained to be invested, so the

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best they can do to mitigate risk is to move from a high risk portfolio to a low risk portfolio. They cannot normally cease investing and hold cash except for very short periods. Statistically, we describe the ability of the model to distinguish between high and low risk portfolios as the probability that the correlation between predicted and realized risk is significantly different from zero. In **Table 1**, this is described by the correlation of realized risk to the initial risk estimates (0.82), and the T-stat for this value, which is 27.46. A T-stat above 2 tells us the model was statistically likely to successfully discriminate between a high risk and low risk portfolio, so we are confident in saying that the model is effective in discriminating between high and low risk portfolios.

2) Estimation error. When we compare a risk forecast to the risk level that was actually realized, were the two numbers close together? This is a less important test because unpredictable large events can occur in the realization period (Tsunami in Japan, Lehman collapse). Nobody has a crystal ball to tell the future and the predicted and realized values will be close if and only if nothing really extreme happens. For the sample period May 2014-June 2015, the standard error of the correlation between predicted and realized risk values was 0.03.

3) Bias. If the risk forecasts are not going to be perfect, are they generally too high or too low? Given that the purpose of the model is to manage risk, we would rather forecast to high than too low. Some of our competitors seem to prefer to give out lower values on the grounds that it is what clients want to hear. In the example in **Table 1**, we can see that tracking error in this test was upwardly biased by about 23%, while the risk for the portfolios in absolute space was under predicted by about 17%.

We test for the above three properties on three types of return data (absolute portfolio returns, absolute benchmark returns, active returns (portfolio-benchmark)), so at the end we have nine basic numbers for each time period studied (three properties on three return sets).

Residual Normality

Other risk model providers prefer a different type of test that is more suited to a one month time horizon. In this test, we take all the risk forecasts for a given return type (e.g. tracking error for active returns) and convert the value to a one month equivalent at a given moment in time. We then observe the return for the subsequent one month, and form the ratio of the return divided by the risk value. The expected distribution of this ratio is unit normal (mean zero and standard deviation one). If the standard deviation of the ratios is less than one the model is overestimating risk. If the standard deviation of the ratios is greater than one, the model is underestimating risk. In this example, the standard deviation of the ratios was 0.83, which corroborates that the model slightly overestimated benchmark relative risk in this test.

"Exceedance" Tests

Financial regulators (that often have experience in banking) often require "exceedance" tests which we believe are very inappropriate for asset management. The idea behind these tests is to determine how frequently the realized risk level is observed to be greater than the forecast. For example, we could say "given our volatility risk forecast of X at a moment in time, we are 95% confident that any realized loss R in the next period will be less than a risk estimate Q." If R turns out to be greater than Q more than 5% of the time the model is judged to be underestimating risk.

This is not an appropriate way to look at risk for a long term investor. Here is a stylized example of why: imagine a Supreme Being exists in the universe, and tells you "the future risk of your portfolio will be exactly 9 units on average but will bounce back and forth randomly between 7 and 11 each day. In order that the realized risk is not bigger than the *risk estimate* Q more than 5% of the time, we need to pick a value for Q that is something close to 11, say 10.5. However, if we manage our portfolio assuming the risk is 10.5 every day, we know that we are overestimating risk on average since the Supreme Being has already told us the true average value is 9.

In the example test in **Table 1,** we just compared each month's return R to the risk estimate for that month (in monthly units) using a T5 distribution, and 99% of the time R was less than Q.

If you are interested in model validation for your organization, contact Northfield Technical Support. In Boston, 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.**

Endnotes:

See also
diBartolomeo, Dan. "Risk Model Testing and Regulatory Reporting." Webinar. 27 August 2015. **http://www.northinfo.com/documents/657.pdf**. Contact Northfield Sales for video recording information.

[1]Board of Governors of the Federal Reserve System. "Guidance on Model Risk Management." April 4, 2011. **http://www.federalreserve.gov/bankinforeg/srletters/sr1107.htm**

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by one business unit as distinct from IBM shares held in the portfolio of another business unit. This allows us to formulate business unit level portfolio constraints (position size, liquidity, tax lots) while optimizing the aggregate portfolio as a whole. Different tax rates and degrees of risk aversion are also computationally accommodated.

While the above process is a traditional quadratic optimization problem, we have also developed a related linear optimization approach to the same issue of dealing with the joint portfolio across related entities. In this process we first form a single optimal portfolio for the entity as a whole, and use this as a benchmark. We then form a vector distance metric (a risk weighted form of "active share") describing the differences between the current portfolio and the target. The vector of trades that would move the aggregate portfolio from the current composition toward the target benchmark portfolio, and each possible trade is classified into a sorted hierarchy based on whether the trade would be tax favorable (i.e. harvest tax losses) or not, and whether the trade would move the portfolio closer to or further from an business unit level constraints (e.g. cash reserves).

It is our belief that the complexity of financial entities is more important than sheer size in understanding the systemic risk implications of organizations. The decentralized nature of the regulatory structure of the insurance industry has contributed to the enormous complexity in firms like AIG. We assert that it is in the interest of company managements, shareholders, and regulators that some modern tools should be brought to bear in managing the assets and financial dealings of such entities.

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Northfield Research Directors Receive Award

We are very proud of Northfield's own Emilian Belev, CFA, ARPM and Rick Gold, Senior Real Estate Research Analyst whose paper, "Optimal Deal Flow for Illiquid Assets" was named the **ARES Practitioners Award/Best Research Paper** by a Practitioner for 2015, by the American Real Estate Society.

Winning this award illustrates just how advanced our work in illiquid investments is. It is also a critical step in modeling the entire plan sponsor portfolio with the same level of robustness as we are doing for marketable securities.

Visit **http://www.northinfo.com/docs/optimaldeal.pdf** to read the full research paper. Contact your Northfield Sales Representative if you would like to learn more about our multi-asset class modeling capabilities for plan sponsors.

Staff Speaking Engagements

On September 15th, Northfield President Dan diBartolomeo spoke at the London Quant Group Annual Seminar, in Cambridge, UK. The topic was "Risk Systems That Read."

Dan presented "In the Eye of the Beholder? Behavioral Aspects of Risk" at the CFA Global Investment Performance Standards Conference in San Diego on September 18th.

On October 5th, Dan will be presenting "Seeing the Really Big Picture: The Impact of Conflict and Corruption on Long Term Financial Markets," at the Journal of Investment Management/MIT Conference, in Cambridge, MA.

Northfield's Emilian Belev and Rick Gold presented their award winning "Optimal Deal Flow for Illiquid Assets" paper at the Boston QWAFFEW Meeting on September 15th.

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

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