



June 2011

Northfield News

A Newsletter for the Friends and Clients of Northfield Information Services

Incorporating Private Equity/Venture Capital into Enterprise-wide Risk Assessments *By Dan diBartolomeo*

Special Points of Interest:

- ▶ **Main Article: Incorporating Private Equity/Venture Capital into Enterprise-wide Risk Assessments**
- ▶ **Tech Support Tip: Constraints**
- ▶ **Annual Conference Agenda**
- ▶ **New Optimizer GUI Coming Soon**
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Historically, the unobservable volatility of illiquid investments such as direct real estate, private equity and venture capital has been essentially ignored by institutional investors. At most, they would use a volatility of a private equity or venture capital index (e.g. Venture Economics) as a proxy for these risks in asset allocation exercises. For many large investors such as sovereign wealth funds, large pension funds and life insurance companies, inclusion of such assets in formal enterprise-wide risk assessments has been simply beyond their capabilities.

During the recent global financial crisis it was amply demonstrated that having formal risk management systems and practices that ignore significant portions of the overall portfolio is a disaster waiting to happen. Every commercial bank and investment bank that failed or required rescues had a formal risk system in place. In some cases those risk systems successfully measured the extreme risks being taken, but bank executives chose to proceed anyway. In many other cases, the high risk levels were poorly estimated because exotic and often illiquid portions of the overall asset portfolios were simply omitted from the risk analysis.

There have been a few attempts to quantify private equity fund risks. Kaplan and Schoar (2005) use CAPM type analysis of returns against a chosen market portfolio as way to describe the risk adjusted returns of PE/VC funds. The weakness of these processes is that the return of an illiquid fund up to the point of liquidation is largely subjective. Fund operators typically have very lax processes for “marking to market” similar to real estate appraisals. There is a large literature in both PE/VC and real estate confirming that the appraisal biases dramatically reduce the apparent volatility of such investments. Of course, the relevance of the “beta” of an investment arises from the CAPM which itself assumes that investments are fully liquid. One recent paper, Buchner (2010) suggests that the idiosyncratic risk, not the beta risk, is what is relevant for asset pricing in illiquid markets.

Phalippou and Gottslag (2007) provide two different suggestions. The first approach is to assume that the beta of a given private investment is equal to the central tendency of the beta value for public firms in the same industry. This same paper also proposes to use the observed risk characteristics of firms just after they gone public via an initial public offering (IPO) to infer risk characteristics of the firm when it was private. Another related paper, Driessen, Lin and Phalippou (2007) uses a factor model approach on fund partnership returns. Loadings to factors such “size” and “value” as defined by Fama and French (1992) are estimated via a generalized method of moments approach.

(Private Equity, Continued on page 4)

Recent and Upcoming Events

2011 Northfield Annual Research Conference

Williamsburg Lodge • Williamsburg, Virginia • June 24th-26th, 2011

We are pleased to announce our 24th annual research conference at the Williamsburg Lodge, in Colonial Williamsburg Virginia. The conference will officially begin on Friday, June 24th and end on Sunday June 26th.

The recently renovated Williamsburg Lodge puts the excitement of Virginia's colonial capital at your doorstep with a generous helping of southern hospitality with impeccable service and a choice of comfortable accommodations. As is customary at Northfield events, a complete recreational and social calendar will accompany the working sessions. Northfield will be sponsoring a variety of activities for attendees on Friday morning including kayaking, a tour of the Jamestown settlement, a boat cruise and tour of Yorktown's Victory Center, and golf.



Williamsburg Lodge

We are accepting online registrations only. To complete your online registration, hotel requirements, and to view the full agenda with detailed presentation abstracts, visit <http://www.northinfo.com/events.php>. Please note that there is an important change from prior years: all hotel reservations are to be made directly using the Williamsburg Lodge website. Contact Kathy Prasad if you have any difficulties registering, kathy@northinfo.com, 617.208.2020.

Agenda

The agenda will consist of eleven 1-hour presentations.

Simple and Robust Risk Budgeting with Expected Shortfall

Thomas Philips, BNP Paribas Investment Partners

Yet Another New Paradigm: Multi-dimensional Strategic Risk Management

Jerome L. Kreuser, The Riskontrol Group GmbH

Are Quants All Fishing in the Same Small Pond with the Same Tackle Box?

Patricia Halper, CFA, Chicago Equity Partners

Modeling Risk with Limited Internal Data

Bryan Campbell, CIRANO

The Rise and Fall of Capitalism in America

Kevin Means, Alpha Equity

Financial Averaging

Andre Mirabelli, Ph.D., Opturo

Representativeness of the Russell New Style Model with Stability Indexes

Barry Feldman, Russell Investments

The Myths and Facts about Risk Parity

Eddie Qian, PanAgora Asset Management

Global Tax Shortfalls Drive The Need For Tax Sensitive Investment Planning

David Boccuzzi, Deloitte Tax LLP

Option Prices Leading Equity Prices: Superior Information Discovery or Superior Information Processing?

Joshua Livnat, Stern School of Business Administration

A New Paradigm for the Hiring and Evaluation of Institutional Asset Managers

Dan diBartolomeo, Northfield Information Services

CFA Society of Japan Conference

June 21, 2011 • Tokyo

Northfield will be sponsoring the CFA Society of Japan conference in Tokyo on June 21st. To register or to learn more, visit <http://www.surveymonkey.com/s/BQKPFBY>.

Northfield Webinar: A Detailed Examination of Minimum Variance and Low Volatility Equity Strategies: A Real Market Inefficiency or Slight of Hand?

July 12, 2011 • 11:00 A.M., E.D.T.

Northfield President Dan diBartolomeo will be hosting a webinar where he will discuss Minimum Variance and Low Volatility Equity Strategies. Registration opens on June 20, 2011. Visit <http://www.northinfo.com/events.php> to view the full abstract and to register.

Attilio Meucci's Advanced Risk and Portfolio Management Bootcamp

August 15-20, 2011 • Baruch College • New York City

This six-day bootcamp covers all aspects of quantitative risk and portfolio management from the foundations to the newest developments. Visit <http://www.northinfo.com/events.php> to register, and view the detailed information and agenda.

Northfield Online Workshop: Recent Product Enhancements from Northfield Research

September 13, 2011 • 11:00 A.M., E.D.T.

Northfield's Anish Shah will be hosting an online workshop where he will discuss the next generation of Northfield Risk Models and the issues motivating both the models and the most recent enhancements to the Northfield Open Optimizer. Registration opens on August 22nd. Visit <http://www.northinfo.com/events.php> to view the full abstract and to register.

Northfield Asia Seminar Series – Research on Investment Management and Risk

Hong Kong • Singapore • Sydney • Tokyo • October 12, 18, 20 and 25, 2011

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. The Sydney seminar will take place at the Quay Restaurant on October 12th. The Singapore seminar will take place on the 18th at the Raffles Hotel. The Hong Kong Seminar will take place on October 20th, at the Landmark Mandarin Oriental and Tokyo will take place on the 25th at the Mandarin Oriental.

Further details will be posted to <http://www.northinfo.com/events.cfm> as the venues and agenda become finalized. Contact Nick Wade in Tokyo if you would like to attend, +81 3 5403 4655 or e-mail: nick@northinfo.com.

Northfield European Seminar

London • November 2011

Northfield will be hosting a one day seminar in November. 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 and venue become finalized. Contact Northfield's London office for further details, +44-(0)-20-7801-6260, rupert@northinfo-europe.com, or neil@northinfo-europe.com

2011 Newport Annual Summer Seminar Wrap-up Tennis Hall of Fame • Newport, Rhode Island • June 3, 2011

Northfield's annual summer seminar took place at the International Tennis Hall of Fame, in Newport, RI on June 3rd. The seminar presented recent research and technical advances to an audience of Northfield clients and friends.

The agenda consisted of 8 presentations including: "High Frequency Trading, Algorithmic Buy-Side Execution and Linguistic Syntax," "An Introduction to Model Based Clustering," "The Real Earnings Management," "Making Risk Management an Actionable Concept," "Strategy Risk and the Central Paradox of Active Management," "Real Estate: A review of real estate's contribution to portfolio risk and return in the new world financial (dis)order" and "A Detailed Examination of Minimum Variance and Low Volatility Equity Strategies: A Real Market Inefficiency or Slight of Hand?"

As is customary, the seminar coincided with the USA Professional Championship of Court Tennis. Following the presentations, attendees viewed a court tennis demonstration by Northfield President Dan diBartolomeo, and then a Semi-Final Match between world champion Rob Fahey of Australia and U.S. competitor Camden Riviere. Riviere defeated Fahey in straight sets. Court Tennis, or "real tennis" is the medieval sport that is the progenitor of all modern racquet sports. To learn more, visit the US Court Tennis Association site at <http://www.uscourttennis.org>.

After tennis on Friday evening, everyone enjoyed a relaxing oceanfront dinner party at Ocean Cliff in Newport. The complete proceedings have been posted to our website at <http://www.northinfo.com/research.php>. Northfield does not charge attendance for this event, however, we do accept donations on behalf of the Pine Street Inn, Boston's primary homeless shelter. This year's attendees donated over \$3,000.

Northfield Webinar: Optimization for Northfield Users May 10, 2011

Mike Knezevich, Northfield's Director of Technical Services, hosted a webinar presentation on May 10, 2011. The webinar was a Northfield-centric description of optimization. Mike discussed the tenets of modern portfolio theory as it is incorporated in Northfield's Optimizer and discuss the maximization of the utility function subject to different constraints and how the Optimizer mitigates constraint conflict during the optimization process.

The event recording can be viewed at:

<https://northinfoevents.webex.com/northinfoevents/lr.php?AT=pb&SP=EC&rID=3704242&rKey=5cc9ede5cdd30dcf>

(Private Equity, continued from page 1)

The European Private Equity and Venture Capital Association has circulated draft guidelines suggesting ways to estimate risks for PE and VC portfolios. One suggestion is to use discounted cash flow analysis to examine each of the underlying company investments within a PE/VC fund portfolio. This approach as described will be insufficient. To understand how the changes in net present value of each investment is correlated to the changes in the net present value of other investments, a detailed analytical model is required. The other suggestion is to simply observe the time series of returns based on fund net asset values provided by general partners, similar to the academic papers described previously. The first is that only a very small fraction of general partners create return estimates based on valuations consistent with the FASB 157 (mark to market) accounting standard. The second is that even when marks to market are done, the valuations are based largely on appraisals rather than transaction values. There is an

extensive academic literature showing that such appraisal based processes tend to smooth volatility and artificially induce seasonality in the return time series. The draft guidelines also have brief suggestions as to the issues of liquidity risk and funding risk in that an investor might sustain a loss under partnership rules if they were unable to meet a commitment for a future cash infusion into a fund.

One way to handle PE/VC risk that is viable would be to do the firm by firm discounted cash flow analysis within the context of a Monte-Carlo simulation wherein the parameters of the valuation of each firm such as expected firm growth rates, the discount rate (interest rate plus an uncertain risk premium), and the timing and valuation at liquidation could all operate as random variables. By coordinating the various across the portfolios firms, we would also be able to estimate the correlation of the unobservable returns of each portfolio company. A framework similar to this was proposed by Cheung, Kapoor and Howley

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(Standard and Poors, 2003) for rating credit default obligations on bonds issued by PE funds in order to leverage their portfolio. However, we should keep in mind the rather poor track record of the rating agencies with respect to CDOs during the recent financial crisis.

We believe the best way to handle PE/VC risk is with a “matched pair” analysis. This analysis takes advantage of the fact that the predominant exit strategy for PE/VC funds is to sell the company in which they have invested to a public company or undertake an initial public offering. For each investment within the PE/VC fund, we first select a publicly traded company that is the most similar to the private portfolio company. For example, if our PE portfolio company is a supermarket chain in Europe, we identify the most comparable public company. The risk characteristics of the matched public company are immediately accessible within our risk models to act as baseline risk estimate for the private firm. The factor structure of the model allows for immediate analysis of the unobservable correlation between private firms.

Our next step is to adjust the risk exposures of the private firm away from those of the public firm given any specific information we have relating to the structure of the private firm. For example, if we know that the private firm has a debt/equity ratio of three, while the matched public company has a debt/equity has no debt, we need to make appropriate changes. Given the very large number of public firms available in our equity risk models, the cross-sectional relationships between key fundamental variables and factor exposures are readily statistically estimated.

The third step in the process is to adjust the estimated beta and firm specific risk of the private entity to compensate for the particular sensitivity to the IPO market. We know that the IPO market is largely inactive during stock market declines, removing this mechanism as a potential exit strategy. The estimated beta of the private firm must be increased to reflect the high sensitivity of the IPO market to general stock market performance. We also assume that the firm specific risk is comparable to the highest specific risk value observed in our models within a country/sector cohort, as the transition from private to public firm often involves extensive internal stress on company operations.

The fourth and final step is to adjust each private firm level risk estimate within the portfolio for both the illiquidity of investing in private firms, and for any special liquidity constraints arising from the PE/VC partnership structure (e.g. lockup provisions). At the firm level, we accomplish this by including a potential “fire sale” scenario into the risk process (e.g. there is a 1% per month chance that the firm

would have to be sold at two thirds of current estimated value). There is an extensive literature relating to “fire sales” of other illiquid assets such as houses. At the fund level, we recognize that the even if we choose to express risk in annual volatility units, a typical PE/VC partnership may have lockup provisions that require investors to keep their money in the fund for five years or longer. Over such an extended period, the potential for a fund to have a large drawdown for at least one moment of time will accumulate. In essence, we have to worry about “first passage” rather than “end of period” risk. For more information on first passage risk, see diBartolomeo (Investment and Wealth Monitor, March 2011). The risk of future funding commitments can be modeled as well as a long/short portfolio that is long “generic” equity and short a bond. In essence, the investor has made a promise of future cash to the partnership in return for additional participation in the equity partnership. To the extent that the future firm level investments of the partnership are unknown at present, we can only use a generic representation.

Once each firm level investment within a PE/VC fund has been evaluated, we construct a “composite asset” to represent the fund and all of its constituents within the Northfield risk model framework. At this point, any risk analysis or optimization task can be performed on the investor’s entire portfolio (multi-asset class) inclusive of the PE/VC fund components.

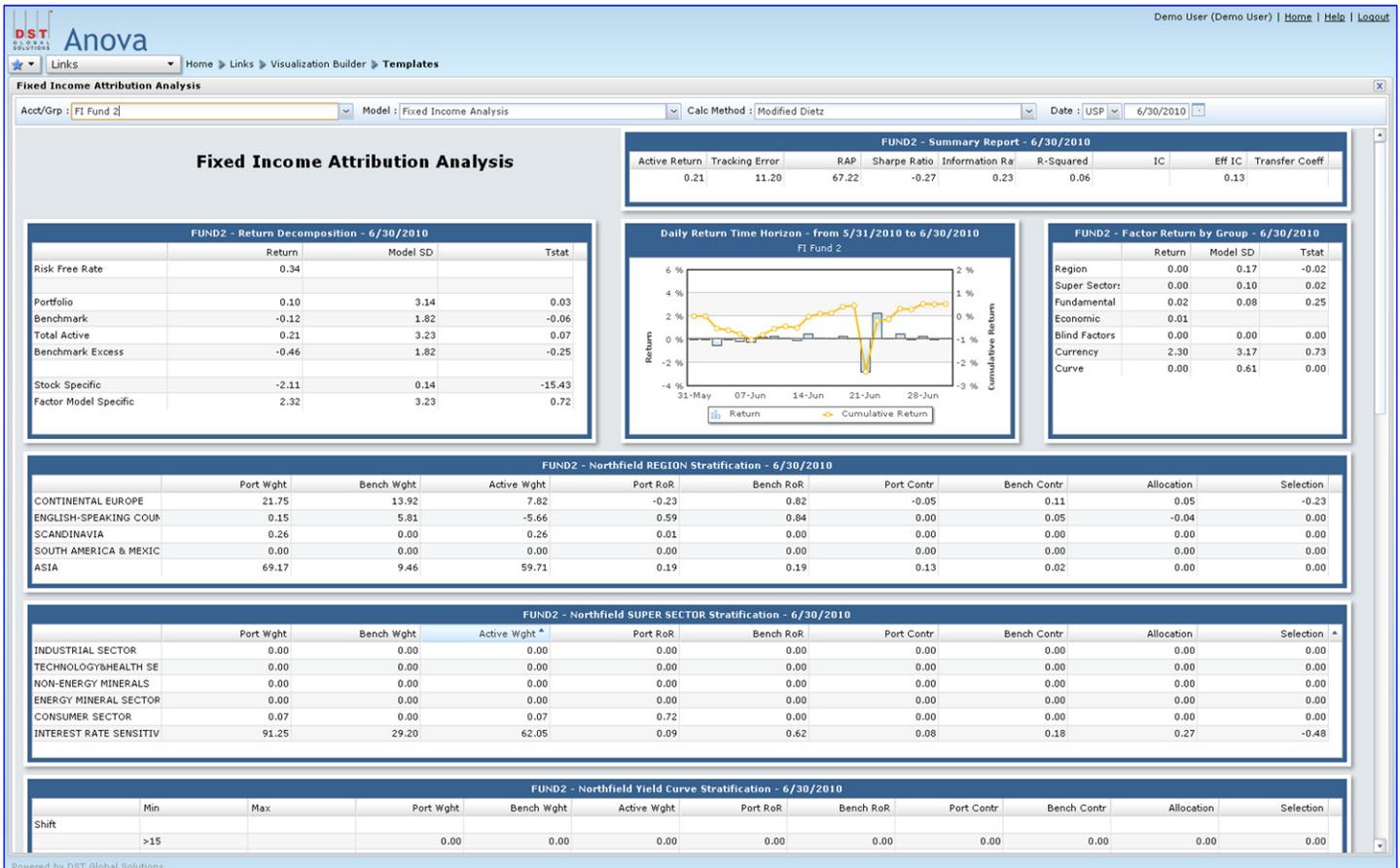
Northfield hopes to garner significant cooperation from private equity and venture capital general partners in this effort. We have discussed creating a standardized process by which general partners and the companies in which they have invested could submit relevant information through an online web portal to minimize the amount of manual data collection required of Northfield and our clients. Since any one partnership will have many limited partners, a vast amount of duplicate effort can be avoided in this fashion. It would also afford general partners to provide meaningful risk and correlation estimates for each of their partnerships. By having greater transparency around risk, there should be more comfort for institutional investors leading to larger allocations of capital to private equity and venture deals. At least one Boston-based venture capital firm has agreed to participate in this process, and we in preliminary discussions with several more firms around the country.

Northfield Partnership with DST Global Solutions

By Russ Hovanec

This spring, Northfield joined forces with DST Global Solutions to integrate Northfield analytics and risk models within DST's suite of products. The initial effort integrates Northfield's Open Performance Attribution engine and ex-poste risk models into DST's Anova platform. Target clients include investment managers and pensions who face the challenge of analyzing ex-poste risk and attributing performance for diverse portfolios across countries and currencies containing all asset classes. The first offering, fixed income attribution, utilizes Northfield's Everything Everywhere (EE) risk model to provide a consistent risk

framework across asset classes to address the impact of global as well as traditional fixed income factors while aligning the attribution process to the client's investment style. Anova provides a rich set of reports and graphs (example below) to satisfy clients' back and middle office reporting requirements. Please contact your Northfield sales representative or anova@dstglobalsolutions.com for more information.



Anova Fixed Income Attribution Results Page

New Optimizer GUI Coming Soon

The standalone version of the Northfield Open Optimizer will be getting a new and improved GUI design. The release is scheduled for August 30, 2011. The design has been improved with a focus on offering more user friendly features. Some of the enhancements include:

- Application Button - Click to get a full menu of the system
- Quick Toolbar- User 'favorite buttons,' this will be customizable so you can pick the buttons of your choice
- Launch Buttons-invokes a dialog with more detailed specifications for a group

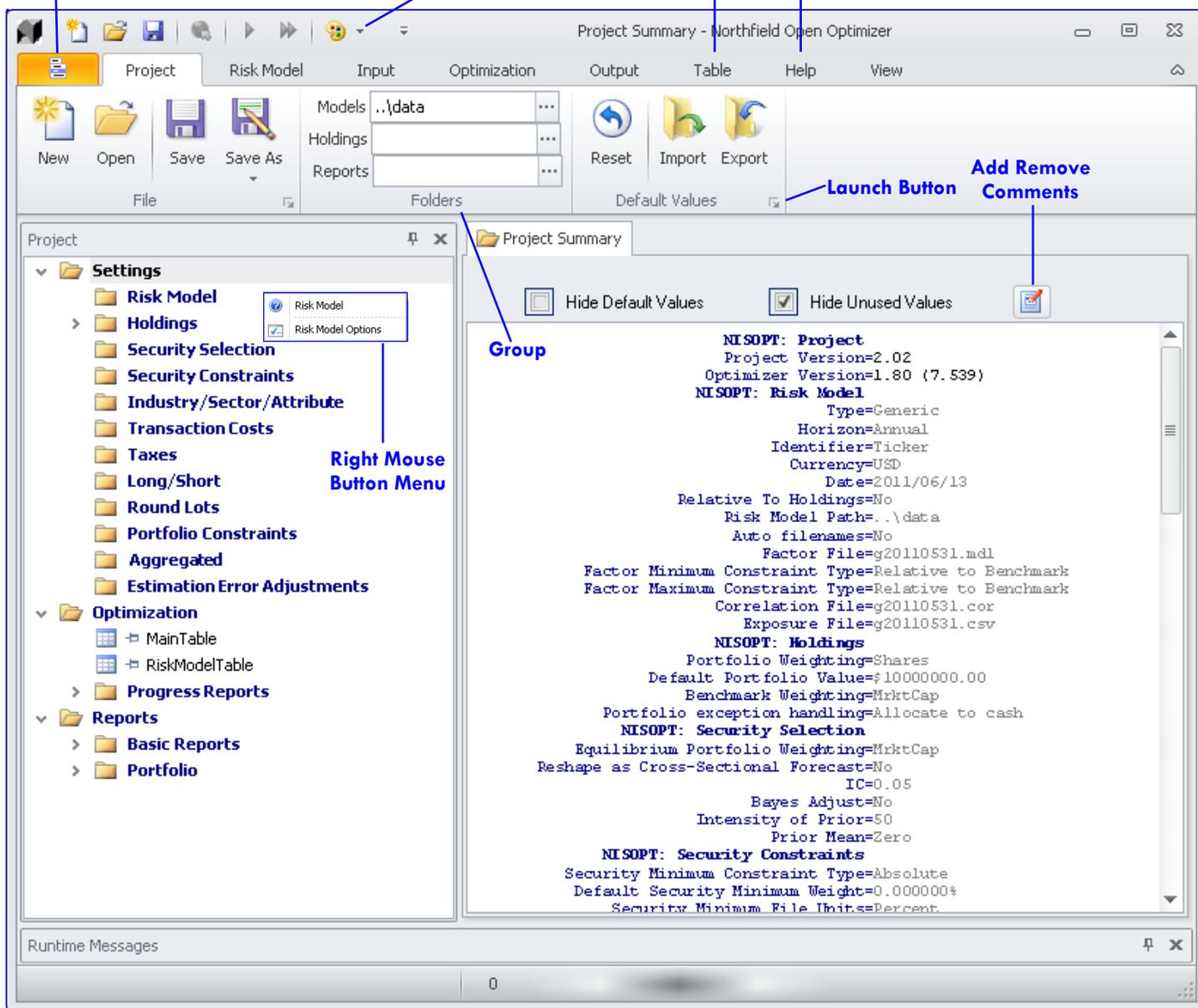
- Add/Remove Comments- allows users to add comments to the project.
- Predefined Paint Screens
- Autoload Button:- This allows the automatic downloading of the selected risk model files from Northfield's servers.
- Right Mouse Button Context Menus

Please note that the new Optimizer GUI is 100% compatible with the current version, so there will be no conversion tasks for existing files or projects. Contact your Northfield Sales Representative if you have further questions.

Application Button

Quick Toolbar

Page Page



Tech Support Tip: Constraints

By Mike Knezevich

In its simplest form, an optimization seeks to maximize the risk return trade-off, constructing the most efficient portfolio possible given user inputs. Often portfolio construction may be impacted by various limitations or desired portfolio characteristics that cannot be expressed in the utility function. Such restrictions are implemented during the optimization via constraints.

Constraint misuse is the largest contributor of failed optimizations and may hamper the optimizer's ability to obtain maximum utility as defined by the user. The greatest level of utility is achieved with an unconstrained portfolio allowing the maximum trade-off between inputs. Certain constraint settings could move the final portfolio away from the unconstrained optimization results, likely causing the final portfolio to be sub-optimal with respect to the inputs. Due to this profound impact, it's important to understand the different constraints and how they may affect the optimization.

This article discusses three different categories of constraints which may be applied during the optimization.

1. Quadratic Penalties are costs that impact the utility function to shape the portfolio to desired characteristics. The further away the portfolio moves from its goal the more negatively utility is effected.
2. Class 1 Constraints are all limiting portfolio characteristics that can be expressed as a linear combination of security weights (asset min wt/max wt, factor loading, industry weights, sector weights, etc.).
3. Class 2 Constraints are all constraints that cannot be expressed as a linear combination of security weights such as the max number of portfolio assets, turnover or minimum trade sizes.

The bulk of the newsletter content will focus on the quadratic penalties and class 2 constraints since class 1 constraints are very straightforward.

Quadratic Penalties:

Quadratic penalties generate a cost which is directly accounted for in the utility function. This cost is in itself a function of the portfolio's current exposure, the user's desired exposure and a scalar which applies a level of importance to the variable. Penalty costs grow quadratically as the portfolio exposure moves further from the goal while

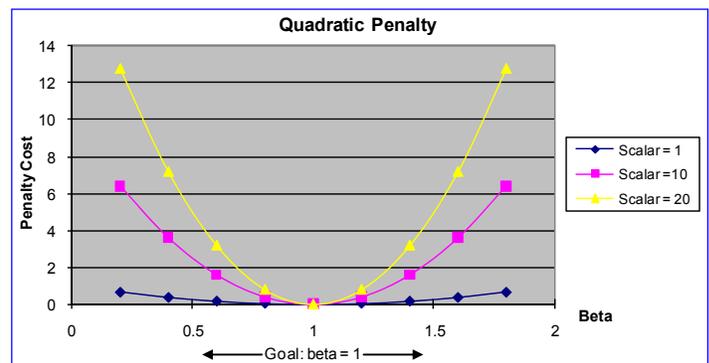
the scalar controls the magnitude. The penalty cost function is expressed as:

$$\text{PenaltyCost} = \text{Scale} \times (\text{Goal} - \text{Current})^2$$

An example can best illustrate the quadratic penalty cost. Lets assume we want to construct a portfolio with a goal of beta = 1. When portfolio beta differs from the goal of 1 in either direction there is a cost to utility. Let's say the current beta = 1.5 and the scale = 1, the penalty cost is calculated as:

$$\text{PenaltyCost} = 1 \times (1 - 1.5)^2 = 0.25$$

We can graphically demonstrate the shape of the quadratic penalty cost function of betas differing from our goal and the impact of different scalars (1, 10, and 20) on the magnitude of the cost:



As the graph illustrates, the higher the scalar, the greater the penalty cost in either direction, but scalars are not the only input affecting the magnitude. Units used in measuring the exposures also have an impact. For example, the typical stock P/E ratio falls between 10 and 17. Let's say we have a goal of P/E = 15 and are currently at 10.

$$\text{PenaltyCost} = 1 \times (15 - 10)^2 = 25$$

Just based on the larger units, the penalty cost for P/E ratios is already much higher than the beta example above by a factor of 100.

Penalties may be applied to:

- Industries/Sector where the goal is the benchmark weight
- Any factor attribute for which a user can supply data which provides the flexibility to set any goal

For more information on applying penalties, please see "Technical Support Tip: How to Use Penalties", <http://www.northinfo.com/documents/190.pdf>

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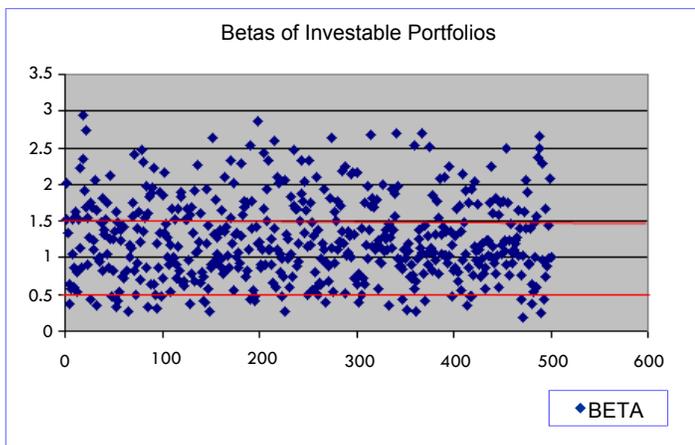
Class 1 (Linear) Constraints:

Class 1 constraints fit the traditional definition of a constraint by eliminating portfolios which violate desired criteria. Exposures are asset weights or a linear combination of asset weights.

Class 1 constraints are of the highest priority during the optimization and include (in order of importance):

1. Position limits
2. Group constraints such as Industry and Sector limits
3. Factor exposure
4. Attribute file variables

For example say we have an investable universe of 500 portfolios, but decide to limit the acceptable beta range for the portfolios to be between .5 and 1.5. This effectively eliminates about 200 portfolios from the investable universe. Only those portfolios falling within the range can be held.



Class 2 Constraints:

Class 2 constraints are applied after class 1 constraints have been applied and utility has been maximized. Class 2 constraints use a heuristic process to re-shape the optimal portfolio.

Class 2 constraints include:

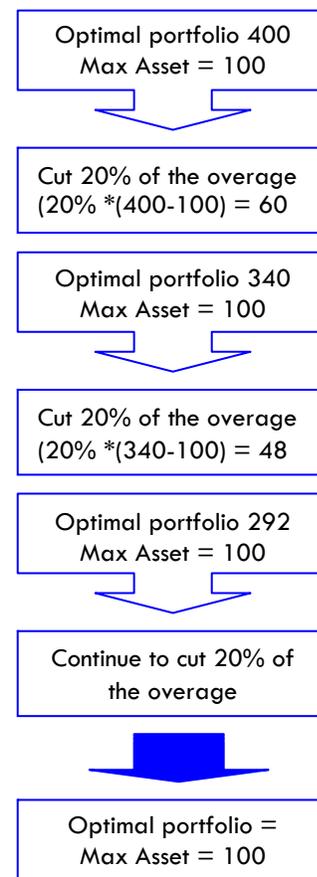
- Maximum number of assets
- Maximum turnover
- Minimum trade sizes
- Maximum realized capital gain
- Holding threshold

A contrived example using a max asset constraint can best illustrate the impact of class 2 constraints. All other class 2 constraints are computationally solved in a similar fashion.

A manager currently holds a 500 asset passive portfolio versus the S&P500, but wants to re-construct the portfolio to be more active with max assets = 100, any asset in the benchmark can be held, RAP is set to 10 (see Tech Support Tip: Risk Acceptance Parameter (RAP), <http://www.northinfo.com/Documents/413.pdf>) and alphas are provided, ranging from +/-1%.

Contradictory objectives have purposefully been chosen to exaggerate the impact of the max asset constraint. The relatively small alphas indicate the manager is not confident in the amount of information, thus the best risk-return trade-off would be to continue to hold a well diversified portfolio. However, we are arbitrarily limiting the manager to hold only 100 assets.

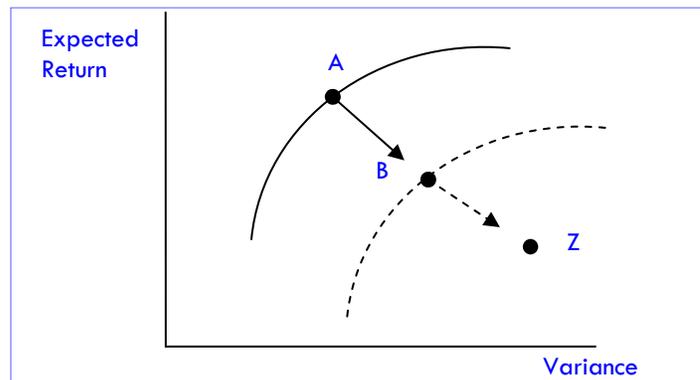
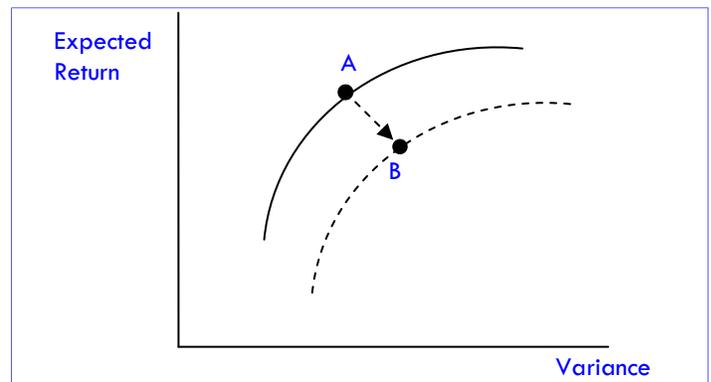
Let's say the optimizer hypothetically constructs a portfolio containing 400 assets. The max asset heuristic must remove 300 assets from the optimal portfolio. The heuristic begins by ranking assets in the optimal portfolio according to weight and then cutting 20% of the smallest holdings above the 100 maximum. During the first iteration, the portfolio would go from 400 names to 340 names ($400 - 0.2 \cdot (400 - 100) = 340$). These 340 assets are re-optimized and then ranked again according to weight with 20% of the assets above 100 being removed. This process continues as illustrated below until the 100 asset maximum is met:



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The possible impact on utility of the max asset constraint is graphically represented in the figure below. User supplied inputs construct the efficient frontier represented by the solid black line. Portfolio A represents the unconstrained optimal portfolio which maximizes utility but contains 400 assets. Since portfolio A violates the max asset constraint, the max asset heuristic is invoked. During the process the portfolio moves along the path from the optimal portfolio A to portfolio B by cutting assets and re-optimizing as described above. This process continues until we ultimately reach the 100 asset portfolio Z.



As assets are removed, the final portfolio increasingly becomes a subset of the optimal portfolio as defined by the inputs. Hence, given the contradictory preferences for number of assets and alphas, the final portfolio Z has a lower utility and exist below the efficient frontier. Alternative methods have been proposed for resolving class 2 constraints, but whichever method is employed to move from point A to Z, Z is still a subset and will be at least equivalently efficient as or less efficient than the unconstrained optimal portfolio.

Alternatively, alphas which more accurately represent the desired level of active management can be provided. Let's say that range is between -5% and 5%. This time the optimizer constructs a hypothetical portfolio containing 125 assets. In this alternative scenario there are still 25 assets that must be cut.

Graphically (see top of next column) the portfolio moves from portfolio A with 125 assets to portfolio B with 100 assets, the level of utility remains relatively higher than in the previous example while the resulting portfolio characteristics should be closely aligned to that of the unconstrained optimal portfolio. This is expected as the unconstrained portfolio more correctly reflects the user's desire for an active portfolio and removing the 25 assets does not have as a profound impact on the resulting portfolio.

Constraint Priority:

Dependent on constraint settings, an optimization has at least one or possibly multiple optimization iterations, referred to as a "loop" in the runtime messages:

- Main loop: During the main or initial loop, utility is maximized while class 1 constraints must be adhered to.
- Threshold loop: During the post-optimal or threshold loop(s) the optimizer attempts to apply as many of the class 2 constraints to the optimal portfolio without violating any class 1 constraints.

Constraint classes are applied during different steps in the optimization process. A portfolio is considered "infeasible" if any of the constraints are violated.

- Step 1: The optimizer must start from a feasible position. If the portfolio is infeasible the optimizer must first attempt to find a portfolio that meets all class 1 constraints with the least amount of turnover possible. Turnover during this step is included in the over-all turnover. This feasible portfolio is the real starting portfolio for the optimization.
- Step 2: During the main optimization loop the optimizer's goal is to maximize the utility function subject to class 1 constraints according to priority. The optimization may complete prematurely if a class 2 constraint is met that is a stopping criteria, such as max turnover or max capital gains.
- Step 3: The threshold loop begins once the portfolio has been optimized. Assets are trimmed from to optimal portfolio to adhere to class 2 constraints while remaining within class 1 constraints, which still have priority. There is no specific priority among class 2 constraints, so if a constraint conflict exists the optimizer seeks a reasonable compromise based on the objective function.

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Constraint violations occur most frequently during the threshold loop with class 2 constraints if they drive the portfolio too far away from the unconstrained optimal state. Forcing resolution of Class 2 violations gives the user false confidence in the results while masking serious economic conflicts in the input specifications.

Having a better understanding of constraints is useful to users in setting realistic optimization objectives. With the various constraints available to shape an optimization, the setup can easily become complicated, possibly resulting in the utility function becoming of secondary importance. Considering when and how constraints are applied and the different priorities provides insight as to constraints' impact on the portfolio construction process, while constraint violations provide insights as to possible conflicts amongst the different settings' objectives.

WealthBalancer Release Coming Soon

Northfield's new WealthBalancer Service will be released in the 3rd quarter of 2011. WealthBalancer is a robust, flexible toolkit using Northfield's tax optimizer and innovative financial planning techniques to help the wealth advisor manage client portfolios. WealthBalancer uses a "life balance sheet" approach to initiate and then maintain the portfolio construction process for individual investors. Our extended balance sheet methodology captures a client's entire financial picture in the present and future. We believe the Advisor will be better positioned to offer more suitable risk-return investment advice by incorporating tax sensitivity into the analysis up-front before re-balancing asset allocations. Discretionary wealth (total assets minus total liabilities) is used to enhance individualized risk management.

Northfield has created a demonstration video which outlines the features and benefits of this new service. The video is viewable from the homepage of our website, www.northinfo.com, in the new products section. Contact your Northfield Sales Representative for further information.

Northfield Staff Speaking Engagements

Northfield President Dan diBartolomeo presented "The Central Paradox of Active Management," at the May 16th London Quant Group in London.

On May 24th, Dan presented "Incorporating Quantified News into Algorithmic Trading," at the Ravenpack Conference in New York.

Dan and Northfield Staff member Chris Kantos discussed Equity Risk Credit Risk, Low Volatility Investing and the "Value" Premium at the Chicago Quantitative Alliance Technology Conference in New York on June 15th.

On June 17th, Dan will be presenting "Lies, Statistics and Performance Attribution," at the London CFA Society, in London.

On June 21st, Dan will be at the CFA Society of Denmark, Copenhagen. The topic will be "Asset/Liability Management for Private Wealth."

Northfield Asia's Nick Wade presented "Short Term Risk from Long Term Models" at the Thomson Reuters events in Sydney on June 7th, Singapore June 9th, and Tokyo June 16th.

Northfield Asia's James Williams also presented "Short Term Risk from Long Term Models" at the Thomson Reuters seminar on June 14th in Hong Kong.

Northfield Website Update

Dan diBartolomeo has written a new essay which has been posted to the Essay and Commentary section of the Northfield Website. The essay titled "The Tech 40 and Influencing Institutional Investing," discusses Dan's thoughts on his being named to the Institutional Investor's "Tech 40" list. The honor is bestowed upon the forty executives with the greatest influence on financial technology used by the institutional investing community. The essay is available at: www.northinfo.com/Documents/421.pdf.

There is a new section on the website under the Research tab called "Books, Book Sections, and Journal Pages." This new section lists all of Dan diBartolomeo's publications and will allow anyone to send an email to Northfield to request a copy of a specific publication.

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

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