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Northfield News

Quarterly Newsletter for the Friends and Clients of Northfield Information Services

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Style Analysis with Confidence Intervals and Negative Weights By Sandy Warrick

Northfield's asset allocation program, formerly known as PACO (Prioritized Asset Class Optimizer) has recently received a major overhaul, including a number of new features that we believe will be useful for investment advisors, plan sponsors and consultants. Because these new features provide functionality beyond portfolio optimization, we have given the product a new name: Allocation Research Toolkit. Its new features include:

- Innovative portfolio allocation procedures that use the Analytical Hierarchy Process for both individual investors and institutional manager search.
- New fund analysis tools which include Style Analysis and the CUSUM statistic, a technique derived from statistical process control, and adapted for investment manager evaluation by IBM's Watson Laboratory.
- Improved historic simulation that includes tactical rebalancing using historic expected returns.
- Style analysis has been greatly improved with regard to its user interface and reports. This feature has been upgraded to simultaneously analyze multiple funds using both prepackaged and custom combinations of style indices that we have created for equity and fixed income domestic and international managers.
- Style exposures, alpha and tracking error have been added to the database browser, using an appropriate (but modifiable by the user) style group for each fund sector. That ensures the funds with the desired exposures are selected for analysis or portfolio optimization.

Style analysis is a form of constrained regression that uses a weighted combination of market indices to replicate, as closely as possible, the historical return pattern of an investment portfolio. [Sharpe 1998, 1992] The resulting coefficients, called Sharpe style weights, are used to form inferences about a portfolio's behavior and composition. The original Sharpe paper used spanning indices from distinct asset classes.

When using typical style classes, multicollinearity becomes an important issue, and the results become less certain, particularly with regard to the detection of style drift using rolling periods. Nevertheless, this technique has been widely adopted in the investment

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Recent and Upcoming Events

Half-Day Seminar on Asset Allocation, Style Analysis and Manager Search

Northfield Offices • Boston, Massachusetts • July 16, 2004, 8:30-11:15 a.m

Who should attend: plan sponsors, consultants and asset managers

We are pleased to invite you to a half-day seminar on recent advances in methods for asset allocation, style analysis and manager search. Dan diBartolomeo, President, Northfield Information Services, Inc will discuss new, innovative analytical approaches to asset allocation, style analysis and manager search work. We'll also touch on how these techniques have particular relevance to hedge fund investing. The sessions will be in a classroom setting, with Q&A after each topic outlined below. There is no cost of participation, however, we will be accepting donations of behalf of the Pine Street Inn, a Boston homeless shelter. The number of attendees for this event will be strictly limited to just thirty-five, so a prompt RSVP is suggested.

After the seminar, you are also invited to join us for lunch at **Fenway Park's** VIP area, the .406 Club (transportation will not be provided). During the luncheon, there will be a talk by Lou Gorman, General Manager of the Red Sox from 1984 though 1993. In addition, everyone will get a guided walking tour of Fenway Park, one of baseball's most revered venues.

The agenda is as follows:

9:00 a.m. - The CUSUM Technique Applied for Manager Search

CUSUM is a technique originally developed for the study of digital signals. It has been successfully adapted for use in monitoring the returns achieved by active managers. The method involves calculated the rolling sum of standardized active returns, and then identifying key inflection points in this time series. We can then analyze returns subsequent to the key inflection point as being the most relevant for making judgments about manager performance.

9:45a.m. – Style Analysis With and Without Confidence Intervals

Sharpe's method of returns-based style analysis is widely used to monitor and analyze the returns and stylistic characteristics of actively managed funds. Unfortunately, many implementations of this analysis fail to recognize the estimated nature of the results, and represent results without proper consideration of the confidence intervals. We will show that this failure often leads to misleading and incorrect conclusions about style profile of fund, and the returns attributed to various aspects of active management.

10:30 a.m. – Using the Analytical Hierarchy Process for Asset Class and Managed Fund Selection

AHP is a technique in operations research that allows decision makers to have a means to apply their expert knowledge to complex problems in a consistent fashion. Unlike traditional approaches, AHP allows for qualitative, as well as quantitative inputs to be brought to bear on the problem. We will demonstrate how AHP can be used to tackle two common problems, asset allocation and selection of managed funds. The session will conclude with a general discussion covering the weaknesses inherent in certain widely used analytical approaches to the asset allocation problem in the marketplace today.

Please RSVP to Kathy Prasad, 617.208.2020, fax 617.451.2122 or email, kathy@northinfo.com. Reservation forms are available for download from <http://www.northinfo.com/events>. We look forward to seeing you!



Historic Fenway Park

Newport Summer Seminar Wrap-up

Tennis Hall of Fame • Newport, RI • June 6, 2003

Northfield's annual summer seminar took place at the International Tennis Hall of Fame, in Newport, RI on June 4th. The seminar presented recent research and technical advances to an audience of Northfield clients and friends.

The agenda consisted of 6 presentations including: Confronting Trading Issues for the Buy Side, A New Kind of Returns-based Style Analysis, Summary Statistics Arising in Performance Attribution, Measuring the Risk of Directly-Owned Real Estate Using a Securities' Market Framework, Market Efficiency and Asset Allocation, and lastly, Realistic Inclusion of the Market Impact of Large Equity Trades.

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 Ruaraidh Gunn. Fahey won the match and went on to win the championship over Tim Chisholm of the U.S. 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.com>.

After tennis on Friday evening, everyone enjoyed a relaxing dinner party at the Castle Hill Inn & Resort. Complete proceedings have been posted to our website at <http://www.northinfo.com>. Northfield does not charge attendance for this event, however, we do take donations on behalf of Boston's Pine Street Inn. This years participants donated over \$5,000.

2004 Northfield Annual Research Conference Wrap-up

The Fairmont Scottsdale Princess • Scottsdale, Arizona • May 2-5, 2004

Northfield's annual Research Conference took place at the Fairmont Scottsdale Princess, in Scottsdale, Arizona. This five star luxury resort provided participants with a peaceful atmosphere and truly showcased the immense beauty and natural habitat of the Southwest.

The conference presented recent research and technical advances to a sold-out audience of Northfield clients and friends. The agenda consisted of eleven 1-hour long presentations. Topics included, Information Ratio of Active Management, Portable Alpha-Philosophy, Measuring the Risk of Directly-Owned Real Estate Using a Securities' Market Framework, The Transfer Coefficient: Implications for Portfolio Management, The Short-Term and Long-Term Market Efficiencies and Their implications, The PB-ROE Valuation Model Revisited, Top 10 Investment Modeling Mistakes, US Dollar Impact on S&P 500 and Sector Returns, Advances in Market Implied Credit Risk Analysis, Methodological Issues in Designing and Implementing Valid Backtests, and lastly, Global Equity Markets: Relationships Among Fundamental Risk, Valuation, Volatility and Risk Aversion.

As is Northfield tradition, the working sessions were accompanied by a complete recreational and social calendar. The conference started on Sunday evening with the "unofficial" welcome reception. Northfield President Dan diBartolomeo rode in on horseback to kick off the evenings festivities. The "Route 66" themed dinner buffet featured select foods from all along the route 66 highway and was accompanied by a live band.

Monday morning was reserved for recreational pursuits with outings for golf, river rafting, and a four wheel drive jeep excursion. Monday evening featured the traditional Northfield elegant "black tie" gala on the Hacienda Plaza. Dinner was accompanied by live jazz music. Following dinner, the party kicked into high gear with music, drinks and dancing until 12:00.

The final dinner on Tuesday evening featured a "Southwestern Fiesta" by the East Pool. The fiesta entertainment included music from a Mexican salsa trio and dancing by an authentic Mexican dance group. Complete seminar proceedings have been posted to <http://www.northinfo.com/papers>.



The Fairmont Princess

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industry, despite the fact that no explicit confidence interval measures have been available to describe the results.

Angelo Lobosco and Dan diBartolomeo derived an approximation for the confidence intervals of these weights and verified its efficacy using Monte Carlo simulation. [Lobosco and diBartolomeo, 1997]. The estimation of these confidence intervals can help practitioners assess the statistical significance of their results, and aids in determining which indexes to include in the analysis.

Style Analysis Examples

We initially do a long only style analysis with the following 5 domestic and 3 international style indices:

1. 3 month t-bill
2. Russell 1000 Growth
3. Russell 1000 Value
4. Russell 2000 Growth
5. Russell 2000 Value
6. MSCI Europe
7. MSCI Far East
8. S&P/IFCI Composite

We examine the following 7 funds over the period 1997 through the first quarter of 2004 using both the entire time period (for which we report style confidence intervals) and rolling 24 month periods (for which we estimate time varying exposures, alphas and tracking errors between the actual fund and the best-fit portfolio).

Fund Name	Style Wt. %	Error
Russell 1000 Value TR	0	17.52
Russell 1000 Growth TR	48.18	14.97
Russell 2000 Growth TR	51.82	10.51
Russell 2000 Value TR	0	19.01
S&P/IFCI Composite USD	0	10.73
MSCI Far East	0	10.02
MSCI Europe	0	15.89
Citi 3 Month Treasury Bill	0	11.17
Tracking Error	15.0	
Alpha	0.39	

Fidelity Aggressive Growth

This fund has the style exposures, alpha, and tracking error shown in [Table 1](#) for the 1997 to first quarter 2004 period.

The high tracking error shows that these eight indices are not appropriate benchmarks for this fund. Furthermore, the confidence intervals for all of the style weights (including those that are zero) are reasonably large, indicating several possibilities:

1. The securities in the portfolio have betas that are very different from the benchmarks chosen. Perhaps leverage (short weights and weights above 1.0) should be considered as the best way to model these funds, even if short positions are not used in the portfolio itself
2. The style exposures changed a lot during the period. This can be confirmed in [Figure 1](#), which shows the 24 month rolling style exposure variation between large and small cap growth exposure over the period.

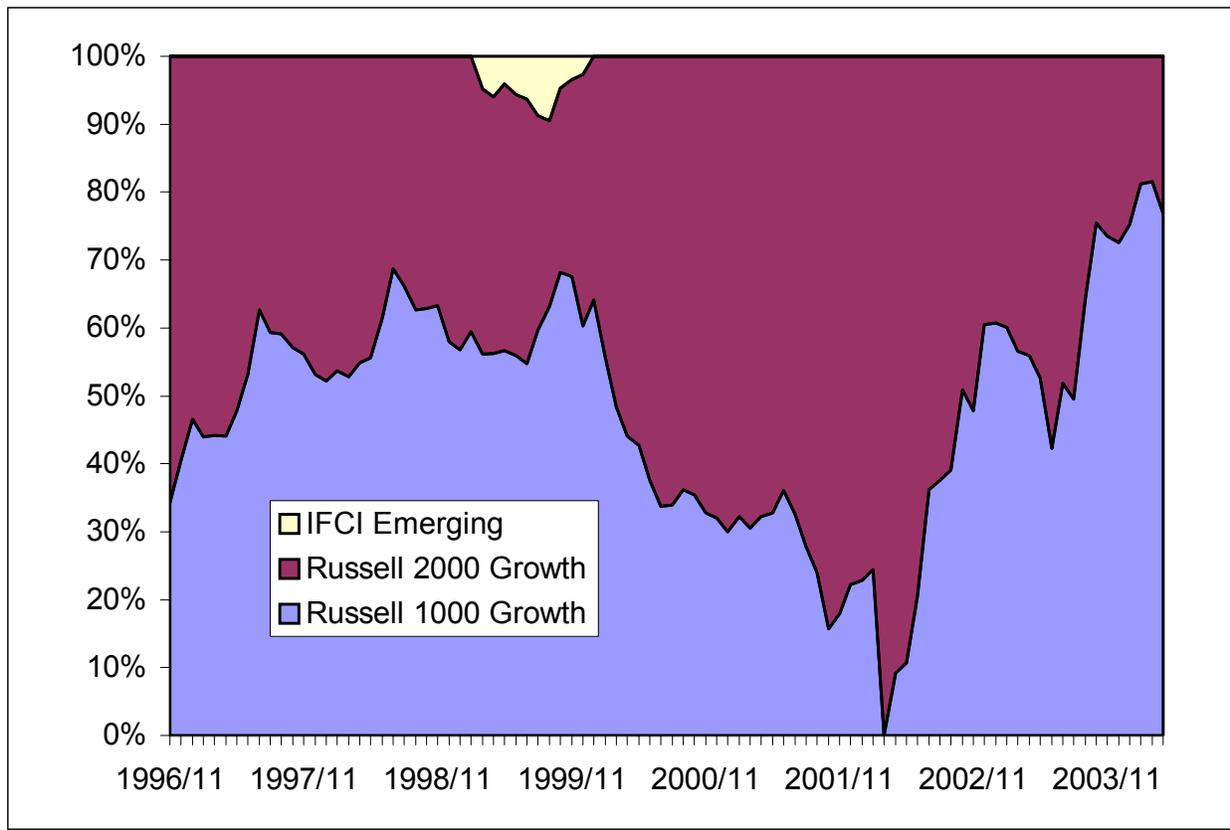


Figure 1: Fidelity Aggressive Growth Style Exposures

Table 2: Fidelity Aggressive Growth: Short Sale Unconstrained

Fund Name	Style Wt. %	Error
Russell 1000 Value TR	15.88	20.44
Russell 1000 Growth TR	71.11	18.19
Russell 2000 Growth TR	85.18	14.58
Russell 2000 Value TR	-68.33	22.32
Citi 3 Month Treasury Bill	-13.47	10.69
MSCI Europe	9.92	13.45
MSCI Far East	-0.3	8.2
Tracking Error	11.11	
Alpha	3.30	

To appreciate the impact of the “short sales constraint” we relax this constraint and redo the analysis for this fund in Table 2, which shows that the “best match” style was 68% short in small cap value stocks, and 13% short in cash. The tracking error to this style dropped considerably and the high alpha (3.3) can be seen to exhibit a high level of stock selection skill. The high level of MSCI Europe may be puzzling, although it is possible that a long position in tech stocks such as Nokia contribute to this exposure. On the other hand, the confidence interval indicates that this exposure is not statistically significant.

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Table 3: Fidelity Equity Income

Fund Name	Style Wt. %	Error
Russell 1000 Value TR	93.27	3.05
Russell 1000 Growth TR	0.00	2.61
Russell 2000 Growth TR	0.00	1.83
Russell 2000 Value TR	0.00	3.31
S&P/IFCI Composite USD	1.73	1.87
MSCI Far East	2.49	1.74
MSCI Europe	2.51	2.76
Tracking Error	2.6	
Alpha	-0.7	

Fidelity Equity Income

At the opposite end of the spectrum from the Aggressive Growth fund is the Equity Income fund whose exposures are shown in [Table 3](#). As can be seen, the confidence intervals are relatively small, indicating that there is a predominant exposure to large cap value, with small (and not highly significant) exposure to European, Far East and Emerging Market indices.

Table 4: Fidelity Low Priced Stock

Fund Name	Style Wt. %	Error
Russell 1000 Value TR	11.98	4.43
Russell 1000 Growth TR	0.41	3.79
Russell 2000 Growth TR	5.05	2.66
Russell 2000 Value TR	58.34	4.81
S&P/IFCI Composite USD	4.77	2.71
MSCI Far East	0.00	2.54
MSCI Europe!	4.29	4.02
Citi 3 Month Treasury Bill	15.17	2.82
Tracking Error	3.8	
Alpha	5.1	

Fidelity Low Priced Stock

Fidelity's Low Priced stock fund, (which concentrates on stocks that are priced below \$35) has performed very well over the 2000 to 2003 period, leading to Fidelity's decision to close this fund. Although this is not strictly a value fund, the funds concentration has typically been in small cap value stocks, as can be seen in [Table 4](#).

As can be seen in the table, the confidence intervals are relatively small, indicating that the fund's style is predominated by small cap value, with exposures of about 12% to large cap value. The 15% exposure to cash may indicate a high exposure to low beta stocks relative to style indices. Nevertheless, the high IR (5.1/3.8) indicates a high level of stock selection skill. The small level of exposure to MSCI Europe is not statistically significant, but the 5% exposure to emerging markets is significant at the 90% confidence level.

Table 5: Fidelity Diversified International

Fund Name	Style Wt. %	Error
DJ ESTOXX Large Growth USD	33.84	7.65
DJ ESTOXX Large Value USD	0.00	7.82
DJ ESTOXX Mid Growth USD	9.92	10.82
DJ ESTOXX Mid Value USD	5.86	12.63
DJ ESTOXX Small Growth USD	0.00	6.82
DJ ESTOXX Small Value USD	0.00	11.53
MSCI Far East	27.73	4.39
S&P/IFCI Composite USD	7.87	5.46
Citi 3 Month Treasury Bill	14.78	4.46
Tracking Error	4.8	
Alpha	7.2	

Fidelity Diversified International

For this fund, we use non-US indices that help determine the style exposures characterizing this manager. In order to help determine the size and style of the European exposures, we use DJ ESTOXX size and growth/value indices, as shown in [Table 5](#). We also use the MSCI Far East and S&P/IFCI emerging market indices, which showed 28% and 8% exposures respectively. The analysis also showed 15% (statistically significant) exposure to cash.

Table 6: Fidelity Export and Multinational

Fund Name	Style Wt. %	Error
Russell 1000 Value TR	28.2	9.0
Russell 1000 Growth TR	25.3	7.7
Russell 2000 Growth TR	25.8	5.3
Russell 2000 Value TR	0	9.7
Citi 3 Month Treasury Bill	5.1	5.8
MSCI Europe	15.3	8.1
S&P/Topix USD	0	4.3
Tracking Error	7.5	
Alpha	6.1	

Fidelity Export and Multinational

This fund is supposed to benefit from stocks that will benefit from US exports. Large cap value, large cap growth and small cap value have essentially equal weight in this analysis, and MSCI Europe is also statistically significant, as seen in [Table 6](#).

Table 7: Fidelity New Millennium

Fund Name	Style Wt. %	Error
S&P/BARRA 500 Growth	1.48	16.78
S&P/BARRA 500 Value	0.00	29.28
S&P/BARRA Midcap 400 Value	0.00	25.92
S&P/BARRA Midcap 400 Growth	59.89	19.73
S&P/BARRA 600 SmCap Value	0.00	25.74
S&P/BARRA 600 SmCap Growth	35.93	17.90
MSCI Europe	0.00	16.31
MSCI Far East	0.00	10.14
S&P/IFCI Composite USD	2.69	10.46
Tracking Error	15.4	
Alpha	5.6	

Fidelity New Millennium

Fidelity's New Millennium fund's concentration has typically been in mid and small cap growth stocks. Therefore, for this fund we use a set of style indices that include S&P large cap, mid cap, small cap and emerging country equity indices, as listed in [Table 7](#). The confidence intervals are relatively high, consistent with the high tracking error of this fund. All foreign indices show zero style exposure with the exception of the very low and insignificant exposure to emerging markets.

A Long-Short Manager

Concluding this analysis, we examine a manager who, we are told, is pursuing a long-short stock strategy, with positions in all domestic size and style sectors. The question is:

1. How much performance is due to a strategic (> 6 months) positions in asset classes.
2. How much performance is due to tactical (< 3 months) positions in asset classes.
3. How much performance is related to security selection or investments in other asset classes outside the chosen style indices?

Initially, all we know is this manager has an excess return (above t-bill) of about 10% per year with an excess return volatility of 7.6%. This results in a very high Sharpe ratio of about 1.3 during a period where most indices experienced considerable negative returns and high volatility. Using Style Analysis, we hope to help determine whether these results were due to asset allocation policy or other factors. In [Table 8](#), we model the portfolio's returns using style index weights constrained between 0 and 1.

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Table 8: Unknown Manager, Long Only Style Analysis

Fund	Style Weight	Error
S&P/BARRA 500 Growth	0	11.4
S&P/BARRA 500 Value	0	19.2
S&P/BARRA Midcap 400 Value	0	19.9
S&P/BARRA Midcap 400 Growth	0	15.6
S&P/BARRA 600 SmCap Value	9.9	16.6
S&P/BARRA 600 SmCap Growth	0	17.0
Citi 3 Month Treasury Bill	90.0	6.8
Tracking Error	7.3	
Alpha	8.0	

If we can only maintain this index constraint, Table 8 shows the manager had an average 10% exposure to small cap value. This reduces the tracking error to 7.3% and the alpha to 8.0, because this asset class had an average annual return of 12% over this period. However, this 10% exposure is not significant, either due to the fact that the net position in small cap value changed over the period or this position was normally hedged by highly correlated asset classes (such as small cap growth or mid cap value).

Table 9: Unknown Manager, Long-Short Style Analysis

Fund	Style Weight	Error
S&P/BARRA 500 Growth	12.3	11.9
S&P/BARRA 500 Value	-22.6	16.5
S&P/BARRA Midcap 400 Value	-11.0	19.3
S&P/BARRA Midcap 400 Growth	23.0	14.0
S&P/BARRA 600 SmCap Value	67.8	15.8
S&P/BARRA 600 SmCap Growth	-66.5	16.1
Citi 3 Month Treasury Bill	96.9	6.0
Tracking Error	5.7	
Alpha	5.6	

With the system's ability to specify short positions and leverage, we see the full long-short analysis in Table 9, and we can begin to understand more about the manager's process.

Looking at these style exposures, we can hypothesize how this portfolio was constructed:

1. A small bet that large cap growth would outperform mid cap value.
2. A medium bet that mid cap growth would outperform large cap value.
3. A large bet that small cap value would outperform small cap growth.

This analysis shows that both the tracking error (7.3 to 5.7) and the alpha (from 8.0 to 5.6) decrease when short style exposures are taken into account.

The results of the style analysis help determine the cause of the manager's performance. The alpha estimated by the long-short style analysis decreased in relation to both the cash only metric and the long index only analysis. Therefore, some of the performance was due to a persistent style bias.

More detailed insights in to the manager's performance can be developed through the investigation of the rolling period analysis. This will help determine if the manager's performance is due to tactical rotation. If the average alpha for the sequential rolling periods is lower than that alpha for the entire period, then one can conclude that style rotation was the source of some of the alpha. Another way to interpret this result uses the CUSUM statistic, which we will discuss in our next newsletter.

References

Lobosco, Angelo and DiBartolomeo, Dan, "Approximating the Confidence Intervals for Sharpe Style Weights," *Financial Analyst's Journal*, July/August 1997, Volume 53 Number 4.

Sharpe, William F., "Determining a Fund's Effective Asset Mix," *Investment Management Review*, December 1988, pp. 59-69.

Sharpe, William F., "Asset Allocation: Management Style and Performance Measurement," *The Journal of Portfolio Management*, Volume 18, Winter 1992, pp. 7-19

Technical Support Tip: Choosing Risk Acceptance Parameter

By Dan diBartolomeo & Jennifer Gerber

What is RAP?

Investor utility is usually expressed as $U = R - LV$ where R is the return and V is the variance (in decimal terms) or it can be expressed as $U = R - V/RAP$ where R is return and V is the variance (in percentage terms) hence $RAP = 100*(1/L)$.

The expected value for the annual compound rate of return is equal to the expected value of the arithmetic mean rate of return minus one half of the variance (assuming all terms are in decimal form). Although the relationship is only true exactly for an infinitely long time period, it usually converges in 25 to 30 years for most empirical problems. This is covered in "Variance Drain", Tom Messmore, Journal of Portfolio Management, 1995.

Choosing the RAP Value: A Rule of thumb

In theory, investors should be able to specify their willingness to specify their Risk Acceptance Parameter from their own understanding of their willingness to trade additional risk for additional expectations of return. Unfortunately, many investors don't really think this way and rely on simply setting some sort of volatility (or tracking error) limit for the portfolio. As such, we tried to develop a way to come to a sensible RAP value directly from a specified risk limit.

Here's the idea:

We know that if an investor had an infinite time horizon and wanted to maximize their terminal wealth, the appropriate RAP is 200. This is called growth optimal investing. This comes from the relation:

$$C = A - (S^2)/2$$

where C = compound annual rate of return in decimals
 A = the arithmetic mean rate of return in decimals
 $S^2 = V =$ variance of the annual return, in decimal $\%^2$

This is covered in a paper by Messmore (Messmore, Tom "Variance Drain," Journal of Portfolio Management, 1995, v21 (4), 104-110.) It's derived from a Taylor series expansion of the logarithm of wealth. If we have returns in % rather than decimal form, this just becomes

$$C = A - (S^2)/200$$

This should look like the first couple terms of our Optimizer utility function with RAP set to 200, because that's exactly what it is.

In the real world, most investors don't have an infinite time horizon and do care about what their wealth is during the investing period, not just at the end, so no one really acts this way. Jarrod Wilcox suggests that investors have a floor value of their wealth below which they are unwilling to risk losses. Jarrod Wilcox, "Better Risk Management," Journal of Portfolio Management, 2000, v26 (4, Summer), 53-64],

For example, an investor might say "I want to maximize my long-term growth in wealth, subject to a limit of never losing more than 20% of my initial wealth". So the investor has separated their current wealth into two portions, a portion on which they are willing to take no risk (RAP = 0) and another portion on which they are trying to maximize the long-term growth (RAP = 200). So RAP for this investor would be:

$$RAP = (D/100)*200 + (1-D/100)*0$$

If $D = 20 = (20\% \text{ of wealth I'm willing to lose})$ this equates to a RAP of 40

If returns are normally distributed, we can think of a loss of D% of wealth, as a particular number of standard deviations. For example, if you tend to think of "worst case scenario" events in terms of a three standard deviation event, since three standard deviations cover about 99% of the events in a normal distribution. So we can substitute

$$D = 3*S$$

Simplifying this expression, we are left with

$$RAP = 6*S$$

For more information on RAPs or various other topics in regards to the Optimizer please visit the FAQ section of the Help file. The FAQ section can be found by opening the Northfield Optimizer and clicking on Help Contents and then simply scroll down to FAQ.

To contact Technical Support, e-mail to support@northinfo.com or call 617.208.2080 between the hours of 8am to 6:30pm EST Monday through Friday. European clients can contact Christine Milne in our London office, christine@northinfo-europe.com or by calling +44 (0)20 7801 6260.

Northfield Staff Speaking Engagements

Northfield President Dan diBartolomeo spoke on May 18th at the Performance Measurement, Attribution and Risk conference in New York. The topic was on the issues of daily versus monthly performance attribution. Visit <http://www.spauldinggrp.com/pmarconf/index.shtml> for more information.

Dan presented at the Greene Mountain summit on Investor Responsibility in Stowe VT. The subject was a comparison of the characteristics of five US stock indices used as benchmarks for “socially responsible” equity managers. Dan also spoke on June 15th at “fuzzy day”, the annual meeting of the Society of Quantitative Analysts. The subject was on the “History of Risk Management.”

Dan spoke at the New Frontier Advisor’s Portfolio Optimization and Asset Management in Practice conference on June 21st. The topic was how epistemology (the study of the limits of human knowledge) impacts investment decision making.

On June 23rd, Dan gave a presentation at the Morningstar Investment Conference in Chicago. The topic was “Tools for Selecting and Monitoring Mutual Fund Managers.” <http://advisor.morningstar.com/productpages/conference/agenda.asp> for more information.

Lastly, Dan will be presenting most of the content at Northfield’s Half-Day Seminar on Asset Allocation, Style Analysis and Manager Search on July 16th.

Northfield’s Nick Wade presented at the 2004 Beijing International Workshop on Debt Capital Market and Financial Innovation in Beijing, China. The topic was on Credit Risk and Market Risk.

Security Identifier Legal Issues

As you may know, the London Stock Exchange and Standard & Poor’s have stepped up their collection of fees from financial institutions, service and data providers for use of their respective security identifiers (i.e. Sedols, CUSIPs and ISINs).

This situation brings up several points of which you need to be aware:

1. Our agreements with both providers require that Northfield clients have a valid license from the applicable providers above to use their respective identifiers before we can distribute them with Northfield data to you.
2. We are in the process of completing our arrangements with both providers which means that your firm will continue to be legally able to receive Northfield data as per your Northfield license agreement.
3. Despite these rather significant additional fees, we're happy to say that at this point we have chosen not to pass on these costs to our clients.

If you have any suggestions of what you would like to see covered in upcoming issues, please e-mail your ideas to staff@northinfo.com

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