REAL WORLD OPTIMIZATION

Philip S. Wilson, President AdvisoryWorld

Optimization is the process of mathematically determining those combinations of investments (assets and/or securities) that will: (i) achieve the highest possible rate of return for any level of risk that an investor is willing to accept; (ii) include the weightings as may be defined by the advisor's minimum and maximum allowances; and (iii) include those assets/securities that are approved by and appropriate for the investor. Once we understand the risk/return characteristics of the client and their portfolio, we can turn our attention to designing truly diversified and theoretically optimal portfolios.

METHOD OF OPTIMIZATION:

ICE employs a quadratic (multi-factor) mean-variance optimization algorithm. This algorithm calculates optimal solutions using the asset and/or security rates of return, standard deviations, correlation coefficients, covariance, and any maximum or minimum constraints assigned at the asset type, asset class or security levels. An Efficient Frontier curve is displayed which includes up to 150 optimal portfolio mixes.

Optimal portfolios can be calculated using historical or forecasted rates if return and standard deviations. Users can calculate optimal portfolios on a pre-tax or after-tax basis, with management fees, or after inflation.

When using strictly historical data, the optimizer may be unequivocally relied upon to provide the optimal portfolio in terms of return and "risk" for the specified time period. For example, using a time horizon of 1985 to the present, the optimal portfolio displayed would have been the "optimal" portfolio for that time period. Unfortunately, there is no statistical evidence to support the idea that returns will ever repeat themselves at any time in the future. Therefore, it is extremely important that the advisor carefully determine the underlying assumptions that are being used in the system.

PORTFOLIO DIVERSIFICATION

It is a widely held misconception that diversification means owning a lot of different investments. Actually, owning 100 securities doesn't reduce the systematic risk (volatility) of a portfolio one iota over owning 20 securities across industry lines. Diversification is not a function of how many assets are included, but rather are they negatively correlated. In other words, are some assets rising in value when others are declining in value. In fact, a mathematically optimal mix of two perfectly negatively correlated assets (-1.0) would represent a portfolio that will exhibit zero risk and a constant and predictable rate of return. Portfolios that contain only three or four assets may, in fact, be far more diversified than portfolios that contain 10 or 15 assets. AdvisoryWorld's **ICE** application can quickly demonstrate whether or not portfolio assets have low or negative correlations to each other and how, by introducing alternative assets into the portfolio, you can increase portfolio return and reduce volatility.

MARKET AND ECONOMIC CONDITIONS CAN AFFECT CORRELATIONS AND OPTIMAL SOLUTIONS

While correlations don't tend to change over short periods of time (2-5 years), they can change over long periods of time and may be different in times of inflation or deflation. For example, during the 1970's the correlation between stocks and long-term bonds was 0.79 and during the 1980's it was 0.47. Choose the time horizon you are using carefully because, depending on the time horizon and your economic assumptions, the asset correlations and, therefore, the diversification of the portfolio may be dramatically different. There may be times when you, as the advisor, have certain knowledge or expectations that warrant the inclusion or exclusion of some assets irrespective of historical performance and correlation coefficients. A few classic examples would be excluding intermediate and long-term bonds during inflationary and rising interest periods (1975-1980), gold during deflationary periods (1980-1999) and Japanese or Pacific Rim securities in 1988 –2001. Your portfolio should include at least one asset that has a negative correlation or a maximum of 0.30 to the equity component of your portfolio and, ideally, high covariance (covariance measures the timing, direction and momentum of the movement of two independent variables). The **ICE** application permits you to select from databases of over surrogate asset classes, mutual funds, stocks, variable annuities, closed-end funds; ETFs and separate account managers to run a virtually unlimited number of scenarios during varying market and economic conditions beginning in 1968.

ARE THE CURRENT INVESTMENTS THE RIGHT ONES FOR YOUR CLIENT?

Based on the client's risk tolerance and economic situation, the advisor should recommend those assets that, based on historical or forecasted performance, will provide the highest possible rate of return without exceeding the client's tolerance for potential loss. Avoid recommending superfluous assets. If two assets are highly positively correlated, and one has a lower historical or forecasted rate of return and a higher standard deviation, ***the latter investment should be excluded from consideration***. The time period required to meet the client's financial goals is also important when determining which investments should be included. Short-term goals require assets with high liquidity and low risk. Long-term investments can be more volatile and require higher returns that should generally exceed the inflation rate by around 3.00%. If capital is allocated properly to diversified assets, the portfolio will be balanced, portfolio returns will generally be higher over the long-term, and portfolio volatility will be lower.

You **NEVER** want to guess at how assets will perform relative to other assets in the portfolio or how any combination of investments are likely to perform under varying market and economic assumptions. Use the **ICE** application to review your hypothetical portfolios under varying market and economic scenarios enables you to see which ones will provide the best risk/return characteristics for your clients. The colorful and easily understood reports help you to document this analysis for the client's review and your protection. Establishing well thought out policies and objectives and using AdvisoryWorld's **ICE** application will result in portfolios with greater predictability and stability of returns.

When you and the client have decided on which assets are available for investment, you can use **ICE's** multi-factor, multi-level quadratic optimization algorithm to find the portfolio mix that should provide the highest possible rate of return within the client's tolerance for risk. To determine if this portfolio will also achieve the client's financial goals you may use **ICE's** financial planning and Monte Carlo tools.

If you believe that the next 12 -60 months will be somewhat inflationary, then you might want to use an historical time period that was, in fact, inflationary such as 1975-1980, or 1987-1990. Using this time horizon the program will calculate the correlations and standard deviations which actually may exist in this type of economic environment. In general, correlation coefficients do not change materially over long periods of time. For example, during the 10 year periods of the 70's, 80's and 90's the correlation characteristics of short-term and long-term bonds to the S&P500 did not change materially. However, the rates of return and the standard deviations did change substantially (see below). This, however, was not true for the anomalous period from 12/1999 to 8/2009. During a period of rising interest rates and rising security prices the correlation between short and long bonds to the S&P500 was negative. If you believe that the next ten years will be similar economically, then you may want to use correlation and STD values for the period mentioned: *The ICE application is the only one on the market that gives you the flexibility to deal with these issues.*

12/79-12/89	Beta	Correlation	Rate of Return	Standard Deviation
S&P 500			18.22	17.66
Salomon 1-3 yrs	0.07	0.24	12.28	4.97
Salomon 10+ yrs	0.38	0.45	14.89	15.04
REIT Composite	0.58	0.64	13.90	16.11
12/89-12/99				
S&P 500			19.89	11.32
Salomon 1-3 yrs	0.06	0.26	7.41	2.74
Salomon 10+ yrs	0.26	0.37	10.13	7.95
REIT Composite	0.46	0.33	11.63	15.91
12/99-8/09				
S&P 500			-1.45	18.49
Salomon 1-3 yrs	-0.01	-0.80	4.94	3.28
Salomon 10+ yrs	-0.05	-0.11	6.83	7.51
REIT Composite	0.92	0.69	8.12	24.45

Values above were calculated using the Security Analysis functions in the ICE application

To eliminate the problem of using historical values that may not represent your estimates for the future, you will need to forecast rates of return for the next 12-60 months. Forecasting standard deviations may also be appropriate if your forecasted returns are materially different from recent historical performance. In general, a rule of thumb would be to reduce the standard deviations proportionately (i.e. if your estimate is down 50%, then reduce the STD by an equivalent amount). This process of forecasting should give you a better scenario for the portfolio you are designing for your client. Again, there is no guarantee that future returns will actually be reflected by these forecasts or the displayed values for the portfolio.

The ICE application employs optimization to find two "optimal solutions". Optimal Portfolio - Risk, and Optimal Portfolio – Goal.

OPTIMAL PORTFOLIO – RISK:

When using the optimization function the application will first find the optimal portfolio that will achieve the highest possible rate of return without exceeding the Minimum ROR specified for the client. This value is the greatest amount of downside risk (real or nominal loss of principal) in any 12 month period that the client is willing to accept.

OPTIMAL PORTFOLIO – GOAL:

In addition to finding the Optimal Portfolio-Risk, ICE will find the optimal portfolio that will achieve the client's financial goals. Using the Cash Flow & Financial Plan Analysis tools the advisor can set all of the client's financial goals such as college education, major purchases, retirement, leaving money to heirs and any other cash flow contributions and/or withdrawals for any time period. The Optimal Portfolio – Goal is the best portfolio alternative for achieving the client's financial goals with the least amount of risk (volatility).

SETTING CONSTRAINTS

Advisers can specify whether or not certain minimum or maximum constraints are to be applied to the allocation of capital. For example, some individuals cannot, or will not allocate more than 15 to 25% of their capital to real estate. If the client owns the property and building in which he does business, then that proportion of capital will remain a minimum allocation to real estate. Some clients wish to maintain certain minimum levels of capital in cash or cash equivalent accounts thereby requiring a minimum allocation to cash equivalent assets.

It is important not to arbitrarily constrain the portfolio unless absolutely necessary. Allow the optimization models to construct alternative portfolios first, then, if necessary, apply additional constraints on the optimization process. For example, if the optimal portfolio includes a 50% allocation to International Equities, and the adviser or the client do not believe such a concentration of capital in International Equities to be prudent at this time, the adviser may over-ride the model by re-constraining the optimization to a minimum percentage which is acceptable. As you would expect, in most cases where the optimal portfolio is re-constrained you will sacrifice some return and increase the portfolio standard deviation.

USING THE EFFICIENT FRONTIER AS A SALES TOOL

In general, optimal portfolios will always be displayed with a higher return and lower volatility. If both portfolios (the current and proposed) are using the same asset classes, it is important to note that both portfolios have precisely the same probability of achieving the displayed returns and volatility. Therefore, all things being equal, there is no reason for selecting a portfolio other than the more efficient proposed portfolio.
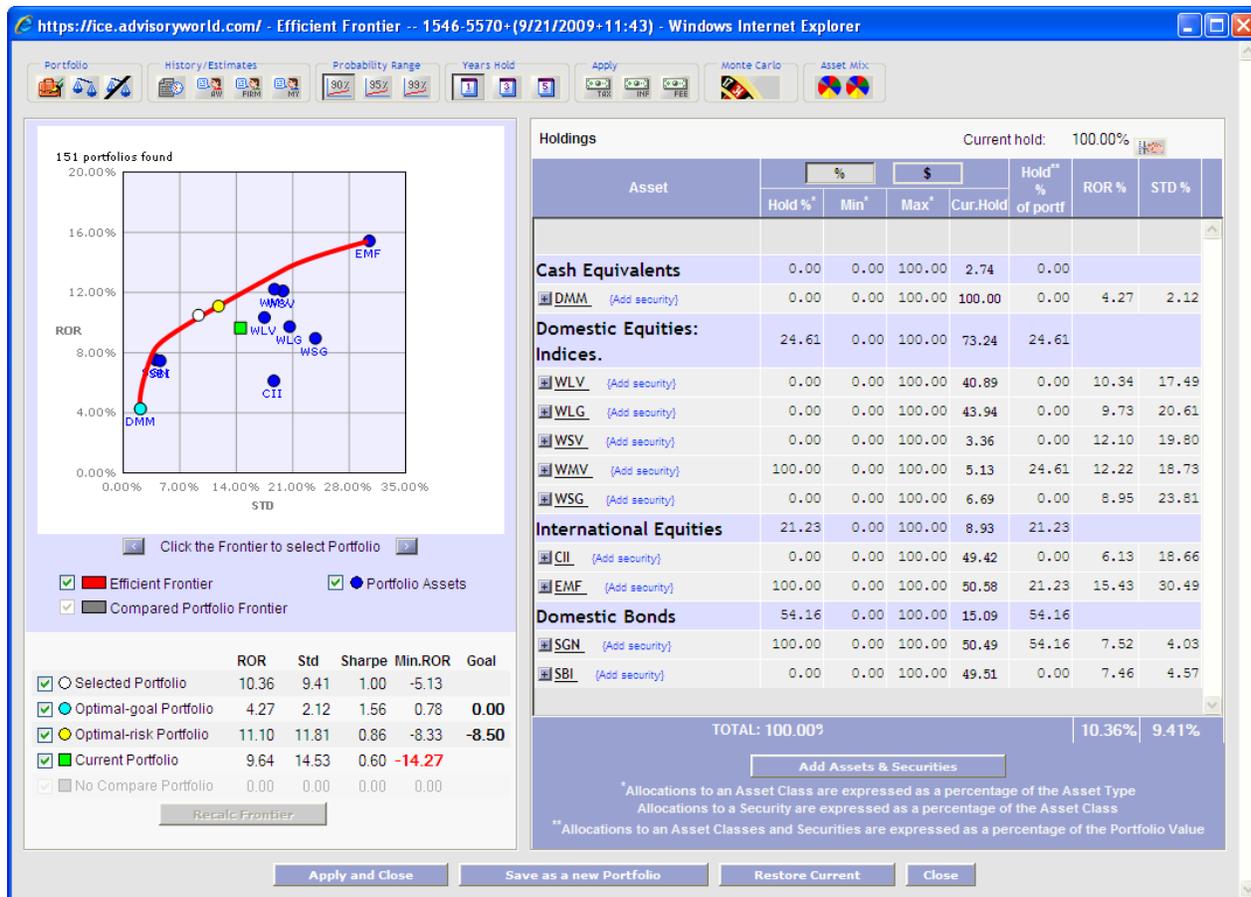
I HAVE ALWAYS CALLED THIS GRAPHIC THE "GET THE CHECK GRAPH". THIS MAY BE THE MOST POWERFUL GRAPHIC PRESENTATION YOU CAN SHOW CLIENTS AS EVIDENCE THAT YOUR RECOMMENDATION IS THE CORRECT ONE.

AT ADVISORYWORLD, OUR PRIMARY OBJECTIVE FOR THE PAST 21 YEARS HAS BEEN TO HELP FINANCIAL ADVISORS ACHIEVE SUCCESS. DURING THAT TIME WE HAVE LEARNED MANY OF THE "DO'S AND DON'TS" IN APPLYING INVESTMENT THEORY AND EFFECTIVELY USING SOPHISTICATED FINANCIAL TOOLS.

If you would like more information on "**Real World Optimization**", or if you'd like to discuss our products and services, please feel free to contact us.

Philip Wilson
President, AdvisoryWorld
(818) 999-0015x101
pwilson@advisoryWorld.com

Ed Fahlstrom
ICE National Sales Manager, AdvisoryWorld
(818) 999-0015x103
efahlstrom@advisoryWorld.com

Mr. Wilson has been in the investment business for 44 years. He has provided investment strategy and related advice to, among others, Sears Pension, Allstate Insurance, Bank of America, and The University of Chicago. He has developed some of the most powerful investment tools currently available including performance evaluation, portfolio analysis, portfolio optimization, wealth accumulation, retirement planning, portfolio hypotheticals and mutual fund hypotheticals programs. He is listed in Barron's Who's Who In America's Pacific Rim as a recognized specialist in portfolio optimization methodologies, has been a guest lecturer on asset allocation and investment strategies throughout the United States, Europe and Australia and was recognized by Investment Advisor Magazine for his contribution to the financial services industry in promoting Modern Portfolio Theory. Mr. Wilson has also written or co-authored articles for the Journal of Accountancy, Investment Management & Research, Wealth Magazine, Financial Advisor Magazine and Investment Advisor Magazine, has been widely quoted in many other investment books and news publications and most recently was a guest on CNN.