

When talking about asset allocation in an investment portfolio whether it be for an institutional client or individual is that diversification across assets that don't typically move in the same direction at once (uncorrelated) is key.

The mantra is asset allocation, as opposed to individual securities selection, drives more than 90% of performance. And this has been proved empirically over the years. What is also hugely important in conjunction with making these decisions is assessing the risk-adjusted returns for a portfolio or individual investment.

This part of the conversation is often when those less experienced investors' eyes glaze over as the terminology and concepts are a little complicated, but a basic understanding is vital in truly understanding the level of 'risk' in your self-managed superannuation fund, investment portfolio or managed fund.

Risk-adjusted return measures how much risk is involved in producing that return, and is generally expressed as a number or rating. Some common risk measures include alpha, beta, the Sharpe ratio and standard deviation. When comparing potential investments, an investor should compare the same risk measures to each different investment to get a relative performance perspective.

What follows is a 'risk-adjusted returns for Dummies' gleaned from a combination of sources that should provide you with tools to have a more meaningful discussion with your advisor or a fund manager.

Fund managers often talk about their quest for alpha in their portfolio, for example an Australian stocks portfolio. This is easily understood as alpha measures the performance of an investment against a market index used as a benchmark. In our example, this could be the S&P/ASX200. The excess returns of a fund relative to the return of a benchmark index is the fund's alpha. Underperformance means the portfolio has recorded negative alpha.

Another common term is beta, which is a measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole. Beta is used in the capital asset pricing model (CAPM), which calculates the expected return of an asset based on its beta and expected market returns. *Expected returns is something that most good fund and portfolio managers should have under review at present as a decade of near zero interest rates globally and abnormally low interest rates domestically might have affected long-term return expectations.*

Expected return is the amount of profit or loss an investor anticipates on an investment that has various expected rates of return. It is calculated by multiplying potential outcomes by the chances of them occurring, and summing these results. For example, if an investment has a 50% chance of gaining 50% and a 50% chance of losing 30%, the expected return is $(50\% \times 50\% + 50\% \times -30\%)$, or 10%.

R-squared is a little more complicated but is worth understanding the basics. It is a number that represents the percentage of a fund or security's movements that can be explained by movements in a benchmark index. R-squared values range from 0 to 1 and are commonly stated as percentages from 0 to 100%. An R-squared of 100% means all movements of a security are completely explained by

movements in the index. A high R-squared, between 85% and 100%, indicates the fund's performance patterns have been in line with the index.

Standard deviation is something many investors and those that remember high-school mathematics should remember and is a measure of the dispersion of a set of data from its mean. If an index is, for example, three standard deviations away from its mean the inference may be that it should revert to the mean in the future. This is by no means guaranteed but it is part of portfolio managers' processes.

The Sharpe Ratio is exceedingly important and has become the industry standard for the calculation of risk adjusted returns. It is the average return earned in excess of the risk-free rate – in simple terms investing in government Treasury bills or cash - per unit of volatility or total risk. What the ratio does is show the performance associated with risk-taking activities, and therefore whether a manager is managing their risk in a prudent fashion and being rewarded for doing so.

Hence, a portfolio engaging in a "zero risk" investment, such as the purchase of Australian 90-day bank bills (the expected return is the risk-free rate) has a Sharpe ratio of exactly zero. The greater the value of the Sharpe ratio, the more attractive the risk-adjusted return. The only caveat with the application of the ratio is that it can be inaccurate when applied to assets that don't have a normal distribution of expected returns such as hedge funds, or portfolios that use derivatives.

Alternative risk-adjusted return methodologies have emerged over the years, including the Sortino Ratio, Return Over Maximum Drawdown (RoMaD), and the Treynor Ratio.

The Sortino ratio is a variation of the Sharpe ratio that differentiates harmful volatility from total overall volatility by using the asset's standard deviation of negative asset returns, called downside deviation. The Sortino ratio takes the asset's return and subtracts the risk-free rate, and then divides that amount by the asset's downside deviation. The ratio was named after Frank A. Sortino.

The Sortino ratio is a useful way for investors, analysts and portfolio managers to evaluate an investment's return for a given level of bad risk. Since this ratio uses the downside deviation as its risk measure, it addresses the problem of using total risk, or standard deviation, as upside volatility is beneficial to investors.

Whether to use Sharpe or Sortino is a matter of preference. The former punishes the investment for good risk, which provides positive returns for investors. However, determining which ratio to use depends on whether the investor wants to focus on standard deviation or downside deviation.

Just like the Sharpe ratio, a higher Sortino ratio is better. When looking at two similar investments, a rational investor would prefer the one with the higher Sortino ratio because it means that the investment is earning more return per unit of bad risk that it takes on.

So how does this play out? Using these tools for assessing risk adjusted returns feeds into Modern Portfolio Theory, which states that adding assets to a diversified portfolio that have correlations of less than one with each other can decrease portfolio risk without sacrificing return.

Such diversification will serve to increase the Sharpe ratio of a portfolio. So-called covariance provides diversification and reduces the overall volatility for a portfolio and is a statistical measure of how two assets move in relation to each other. A positive covariance indicates that two assets move in tandem. A negative covariance indicates two assets move in opposite directions.

In the construction of a portfolio, you are attempting to reduce overall risk while allowing for a positive rate of return.