

## Look for the signal amongst the noise

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### BACKGROUND

When disappointing performance occurs, alarm bells will typically ring in the minds of investors, advisers, asset consultants and (perhaps) the managers themselves. Investing has only ever been a long game. But thanks to the internet, the 24-hour news cycle, social media, etc it appears that all success must occur quickly – including with investing. Investors today have such an enormous selection menu and if one strategy doesn't appear to be working out, it's not difficult to find another... and this has been further enabled by the reduction of transaction costs.

Investment performance analysis has two major problems:

1. Analysis timeframes are too short; and,
2. Only performance (or benchmark relative performance) is observed.

Looking at pure investment performance (or benchmark–relative performance) on a day–by–day, month–by–month and even year–by–year basis a somewhat redundant analysis exercise, as it is mostly noise. Different styles, risks, industries, sectors, and markets constantly go in and out of favour and performance analysis over these short timeframes is typically a waste of time that can lead to high transaction costs and, potentially, even worse performance.

The purpose of this paper is simple. It takes a back–to–basics approach to performance analysis and demonstrates, using a simple case study, one approach of how to cut through the noise to find the signal.

The signal defines what is really happening. The signal is the bigger picture investment view that enables us to undertake better investment analysis and therefore construct better investment portfolios.

### THE SHORT OF IT

The goal of the case study is to analyse two real, actively managed Australian equity strategies – renamed Blue Fund and Orange Fund – to determine their respective suitability for an investment portfolio.

Let's begin with some quick simple statistics for each fund. The average monthly return and volatility (i.e. standard deviation) over time is shown in Figure 1. On this basis, the best

performer is Blue Fund, followed by the Benchmark, and then Orange Fund. Low volatility is typically preferred and despite performance the volatility results are in the same order – Blue Fund, Benchmark, Orange Fund – which is somewhat counter to the old adage that higher return requires higher risk.

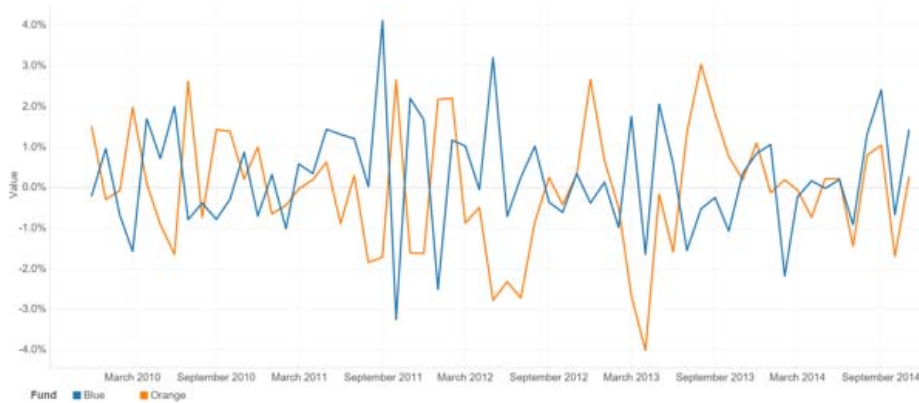
Based on this simple analysis, many would conclude that Blue Fund is superior based on the higher level of return per unit of volatility (similar to Sharpe Ratio). However, Figure 1 also suggests that the average monthly returns of the funds and Benchmark are not statistically different, due to the high levels of volatility.

**Figure 2: Monthly returns and Standard Deviation**  
(Jan 2010 – Sep 2014)

	Blue Fund	Orange Fund	MSCI Australia GR
Average Monthly Return	0.88%	0.60%	0.64%
Volatility (Std Deviation)	2.58%	4.32%	3.58%

The statistical lack of difference between returns is supported by Figure 2, showing the monthly excess returns of each strategy compared to the MSCI Australia GR index. There is no pattern and no one data point is likely to be predictive of the future. Sometimes, Blue Fund outperforms Orange Fund and, sometimes, vice versa. They both outperform the Benchmark at different times. Due to the short time period used for this analysis (monthly returns), Figure 2 provides little to no useful information. It is a very good demonstration of noise with no obvious sign of a signal.

**Figure 2: Excess Returns over 1-month periods**  
(Jan 2010 – Sep 2014)

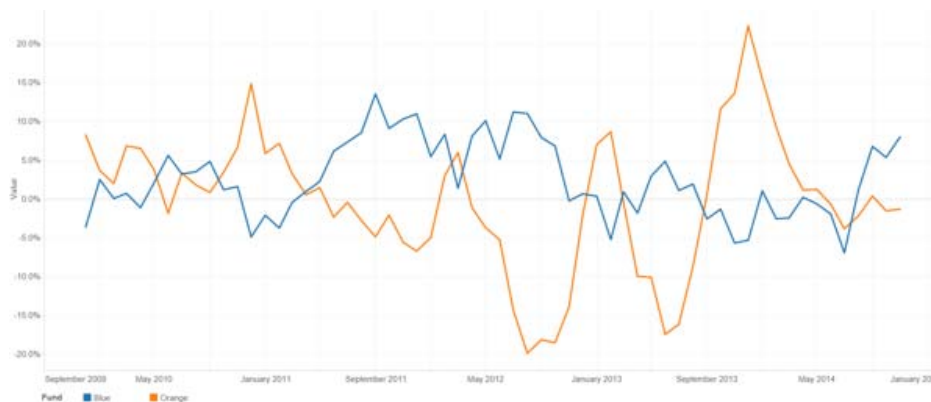


Source: Delta Research & Advisory

## A LITTLE LONGER

The next step is to increase the period of analysis from monthly to 6-monthly rolling periods, a common time period used between portfolio reviews. Figure 3 shows substantial volatility of 6-monthly excess returns and, therefore, reasonable evidence that no one six-monthly period should be used to make an investment decision... and I'm sure that never happens. Six-monthly rolling average returns appear to show no signal for the two funds individually. The search for a meaningful signal continues.

**Figure 3: Excess returns – 6-month rolling average (annualised) (Sep 2009 – Jan 2015)**



Source: Delta Research & Advisory

On the other hand, potentially, there is a signal shown in Figure 3. It appears the respective excess returns of Blue Fund and Orange Fund are moving in opposite directions. And, there are potential signs of Orange Fund showing more extreme levels of outperformance or underperformance. However, at this point in the analysis, these extreme levels should probably be taken with a grain of salt as it has only happened a few times. It may be just good or bad luck.

So, moving from monthly returns to rolling 6-monthly rolling returns (annualised) has yielded some potential insights but nothing conclusive.

Figure 4, takes the analysis of the moving average of excess returns out to three years. Anecdotally, three years is a popular timeframe for fund analysis and it appears to be the amount of time investors and practitioners are prepared to sustain underperformance of any one strategy before changing.

On a three-year rolling excess return basis, the signals get a little stronger. Orange Fund was a consistent underperformer from the middle of the time frame analysed. This sustained underperformance over much longer than three years suggests that many investors and practitioners may have excluded this fund from consideration, or removed it from portfolios altogether.

However, Blue Fund is looking very impressive with very consistent rolling three-year outperformance of the Benchmark through almost the total timeframe. It is looking to be the better strategy. But is it?

**Figure 4: Excess returns – 3-year rolling average (annualised)**  
(Sep 2009 – Jan 2015)



Source: Delta Research & Advisory

## MOVING ON FROM PURE PERFORMANCE – ADJUSTING FOR MARKET RISK

Risk-adjusted performance is frequently performed but, rightly or wrongly, rarely on rolling timeframes and usually only across a single chosen time period. Unfortunately, a single time period reduces a significant amount of information about investment performance behaviour so any risk-adjusted analysis performed continues to be time series based.

The Capital Asset Pricing Model (refer Appendix 1) has a relatively poor reputation for predicting future returns. However, it is an excellent method for calculating exposure to the market (i.e. Beta) and risk-adjusted value added (i.e. Alpha). As we know, all active strategies aim to prove themselves with positive Alpha, which often doubles as the measure that defines “skill”.

Using the Capital Asset Pricing Model, performance analysis of both funds yields their market-risk-adjusted Alpha over rolling three-year periods as shown in Figure 5. It shows the very different behaviour and potential signals of each fund.

Firstly, their respective trends are in relative opposite directions, potentially suggesting they are opposites in style. Blue Fund's alpha became negative in the earlier years – something that didn't show up when analysing excess returns earlier. Orange Fund still shows relatively poor results in the latter half of the timeframe analysed, suggesting many investors would have sold out of Orange Fund given its apparent weak performance.

**Figure 5: CAPM Alpha – 3-year rolling average (annualised)**  
(Sep 2009 – Jan 2015)



Source: Delta Research & Advisory

## ADJUSTING FOR STYLE RISKS

Further risk-based performance analysis takes the Capital Asset Pricing Model a step further and introduces other systematic risks into the model (this model is based on the multi-factor model sometimes called the Arbitrage Pricing Model).

Possibly the most well-known of the multi-factor models is the Fama-French Three Factor model which adds two risk factors – value and size – to the single risk factor Capital Asset Pricing Model. For the purposes of this analysis, there are three additional risk factors which combine MSCI defined indices: Value minus Growth; Small Cap minus Large Cap; and, a Momentum risk premium to MSCI Australia benchmark. Further detail of the model can be found in Appendix 2.

Figure 6 shows the Alpha that remains after adjusting for all four risk factors. We see a dramatic change in fortunes for Orange Fund. It now has positive Alpha for almost all of the time period analysed, whereas Blue Fund has a multi-year period of negative Alpha after adjusting for these multiple systematic risks. So, while Orange Fund produced underperformance compared to the market in the latter half of this time period as discussed earlier, after adjusting for common equity market risk factors, it's added value (Alpha) is positive. This positive Alpha is what we would want to see from an active manager – positive value-add over and above potentially cheap and replicable systematic risks.

**Figure 6: 4-Factor Alpha – 3-year rolling average (annualised)**  
(Sep 2009 – Jan 2015)



Source: Delta Research & Advisory

## HOW DID THIS HAPPEN?

So, introducing non-market systematic risks improved the Alpha of Orange Fund and slightly reduced the Alpha of Blue Fund. How? The answer is logical. One or more of the systematic risks had a significant contribution to the performance of Orange Fund – and the answer is shown in Figure 7. The two funds have clear distinct styles. Blue Fund is clearly a Value-style (which MSCI defines as holding low PE, low Price/Book, and/or High Dividend securities) and Orange Fund clearly has a Growth style (which MSCI defines as holding stocks with high earnings growth, revenue growth, and internal growth).

**Figure 7: Value–Growth risk factor exposure – 3–year rolling average**  
(Sep 2009 – Jan 2015)



Source: Delta Research & Advisory

So, while a fund manager may define how it invests with respect to style, deeper analysis of a fund's performance can reveal whether that fund does what the manager proports (i.e. whether it is "true to label"), and it can uncover what other risk exposures may be driving good or bad performance.

It is worth noting that some qualitative research reports do not specifically define Orange Fund as a "Growth" fund but, given its track record and the definitions of Growth used, it is difficult to argue otherwise.

## CONCLUSION

The process outlined above will differ from strategy to strategy and will depend on what is important with respect to the role of a potential strategy within a broader portfolio. However, what this process shows is the significant benefit in undertaking performance analysis that looks through the short-term noise that all strategies incur and look for signals using longer timeframes.

Finding the signal for constructing better investment portfolios also requires digging deeper into a strategy's return series. It may involve adjusting performance for multiple risks, such as the market or styles (Value, Growth, Size, Momentum, Quality, Credit, Duration, etc) while still increasing the time period of analysis. It is essential to move away from simple time-based performance measures over short time periods to achieve superior portfolio performance with lower transaction costs.

## APPENDIX 1 – CAPITAL ASSET PRICING MODEL

### Equation 1

$$R_{p,t} - R_{f,t} = \alpha + \beta (R_{m,t} - R_{f,t}) + \epsilon$$

where:

- $R_{p,t}$  = Portfolio performance at month t
- $R_{f,t}$  = Risk-free rate at month t (e.g. return of cash at month t)
- $R_{m,t}$  = Market or Benchmark return at month t (e.g. return of MSCI Australia GR at month t)
- $\alpha$  = CAPM Alpha (market or benchmark adjusted outperformance)
- $\beta$  = Market Beta (market exposure)
- $\epsilon$  = error term which represents the difference between the portfolio return and the Capital Asset Pricing Model's predicted return

### Equation 2

$$R_{p,t} - R_{f,t} = \alpha + \beta.(R_{m,t} - R_{f,t}) + \beta_{vmg,t}(\text{Value Factor}) + \beta_{smb,t}(\text{Size Factor}) + \beta_{mom,t}(\text{Momentum Factor}) + \epsilon$$

where:

- $R_{p,t}$  is the monthly portfolio return
- $R_{f,t}$  is monthly Risk-free rate
- $\alpha$  is Alpha which represents the additional average return after removing all systematic risks
- $\beta$  is the market exposure (differs between asset classes)
- $R_{m,t}$  is the market return (differs between asset classes)
- $\beta_{vmg,t}$  is the portfolio exposure to the Value factor
- $\beta_{smb,t}$  is the portfolio exposure to the Size factor
- $\beta_{mom,t}$  is the portfolio exposure to the Momentum factor
- Value Factor is MSCI Australia Value minus MSCI Australia Growth
- Size Factor is MSCI Australia Small minus MSCI Australia Large
- Momentum Factor is MSCI Australia Momentum minus MSCI Australia GR



- $\epsilon$  is the error term that also represents the volatility of Alpha
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