Choose the 'equity escalator' not the 'equity rollercoaster'

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July 2019

Winning by not losing

One of the most frequently cited statistics in tennis is the number of unforced errors a player makes – that is, the points that are lost to self-imposed silly mistakes such as hitting the ball into the net. In contrast, a forced error is one which can be attributed to the opponent's good play, a pinpoint serve which hits the line before the player can react.

Minimising unforced errors can be more important than hitting winners. In the 2008 Wimbledon final, Rafael Nadal bested Roger Federer in what was widely hailed as the greatest tennis match of all time. On most accounts Federer, the defending champion, played the better match: he served more aces, his serve was faster, he played at the net more often (an aggressive tactic), and he hit almost 50% more 'winners'. So how did Nadal win the match?

Analysts attribute his victory to making fewer unforced errors. 'Winning by not losing' is just as important in the world of investment. By quantifying the percentage gain or loss, on average, an investment portfolio experiences in a falling or rising market, investors can gain a valuable insight into how the portfolio might perform relative to an index over the long term. Is it better to outperform in in a rising market, or protect portfolios from falling markets?

Table 1: An example of winning by not losing

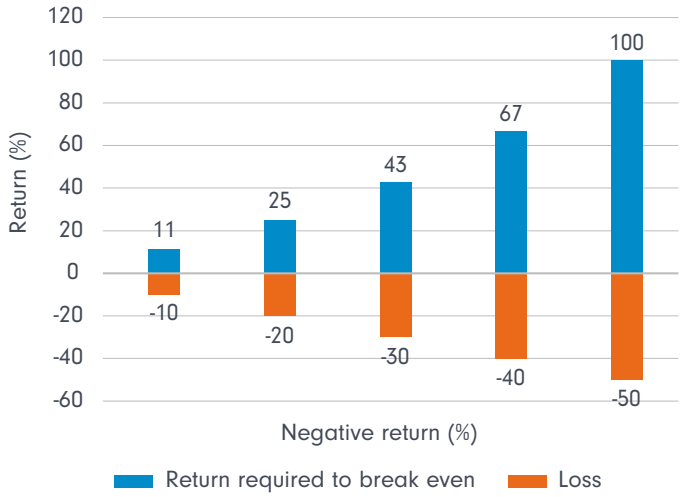
Metric	Roger Federer	Rafael Nadal
Aces	25	6
Winners	89	60
Average first serve speed	188 km/h	180 km/h
Average second serve speed	161 km/h	150 km/h
Net approaches	75	31
Unforced errors	52	27

Source: Fidelity International, 2019.

It has been over a decade since the height of the global financial crisis (GFC), yet it remains in many investors' minds as a stark reminder of how quickly investment losses can mount. Any substantial decline in equity markets, like that experienced during the GFC, can result in a lengthy amount of time before the losses are recouped. For example, the MSCI All Country World (ACWI) ex Australia Price Index (a proxy for global equity markets) peaked on 31 October 2007. Shortly after, the global financial crisis took hold, and by March 2009 the index had reached the bottom, having lost 59% of its value. It wasn't until June 2014, over five years later, that the Index would finally recover from its bottom.

Due to the asymmetry of gains and losses, protecting capital in periods of falling markets can have a material impact on the total return of an investment, especially over the long term. This is due to the compounding effect, which is often overlooked by investors. For example, a loss of 10% would require a subsequent 11.1% gain to break even and recover the value that was initially lost. This asymmetry increases sharply as the loss increases; for example, a 50% loss would require a subsequent 100% gain to break even. The asymmetrical relationship between gains and losses immediately suggests that **limiting losses has a more powerful effect** on long-term growth potential than achieving an equivalent nominal positive return.

Chart 1: Positive returns required to break even following a period of negative returns



Source: Fidelity International, 2019.

This is because protecting from losses in falling markets leaves more capital to grow when markets rise again, contributing to faster recoveries and the potential to generate significant market outperformance through the power of compounding forward.

For example, if an investor had realised only half of the loss of the MSCI ACWI ex Australia Price Index during the GFC (about 30%), and experienced 50% of the daily gains and losses of the index thereafter, it would have taken 22 months to recoup the market's losses, not five years.

The downside and upside capture ratio

Recognising the effect of loss aversion, it is possible to construct investment portfolios with an objective of losing less than the market when the market is falling. This can be quantified using **downside and upside capture ratios**, which are a simple pair of ratios that quantify what percentage gain or loss, on average, an investment experiences in a falling or rising market, respectively – that is, a downside capture ratio of 80% means that if the market is down 10%, then the investment falls by only 8%. The 'market' is defined by the return of a selected benchmark that should be as closely representative of the fund's investment universe as possible.

The downside capture ratio is calculated by taking a fund's monthly return when the benchmark had a negative return, dividing it by the benchmark return for that month, and annualising the amount over a sufficiently long amount of time. The upside capture ratio is calculated in the same way but uses months when the benchmark had a positive performance.

An upside capture ratio greater than 100% indicates that the investment outperformed the benchmark during positive periods **on average**. It achieved a higher return than the benchmark, on average, when the benchmark rose. It does not necessarily mean that the fund outperformed the benchmark in all periods in which the benchmark return was positive.

A downside capture ratio of less than 100% indicates that a fund will, on average, outperform the benchmark during negative periods. In other words, the expected investment loss is less than benchmark, on average, when the benchmark realises a negative return. It does not necessarily mean that the fund will outperform the benchmark in all periods when the benchmark return is negative. A lower downside capture ratio indicates that an investment is expected to be **better at protecting capital** over the long term.

The importance of upside or downside capture ratios may differ amongst investors, dependent upon their risk preferences. For example, conservative investors with a preference for capital preservation would be expected to prefer investments that have downside capture ratio percentages that are less than 100%.

To illustrate the relationship between upside/downside capture ratios and performance, assume a benchmark gains 2% in a month and then loses 2% the following month (and then continues on with this pattern of returns), this results in a market that is consistently drifting lower. This is because a 2% loss that follows a 2% gain more than offsets the gains from the prior month. For example, an investment of $1,000 would rise to $1,020 after the first month, but the following month after losing 2% the investment would be worth $999.60.

Examples:

Suppose there are three investment funds with the following characteristics:

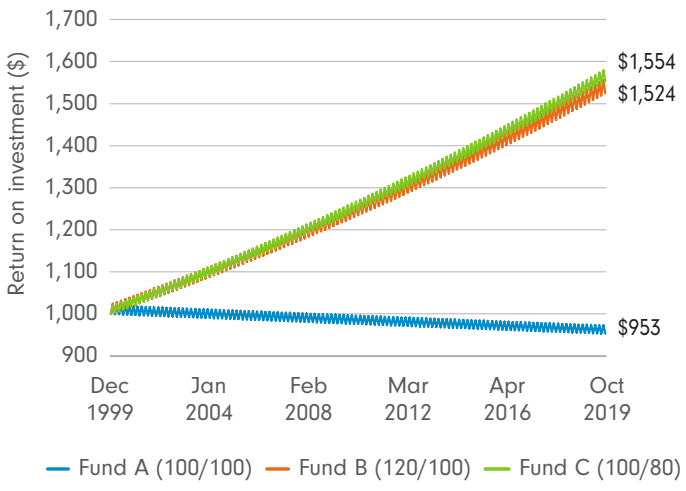
- **Fund A:** Upside capture ratio of 100%, downside capture ratio of 100%
- **Fund B:** Upside capture ratio of 120%, downside capture ratio of 100%
- **Fund C:** Upside capture ratio of 100%, downside capture ratio of 80%

Fund A has the characteristics expected of an index fund or passive exchange traded fund. Based on these numbers alone, one might be inclined to believe that fund B would outperform the others, based on its higher upside capture ratio. But if each fund invests $1,000 for a 20-year period in this market,

- Fund A would have an ending value of $953
- Fund B, with a stronger upside capture ratio, would have an ending value of $1,524
- Fund C, with a superior downside capture ratio, would end the period with $1,554

Chart 2 shows the cumulative returns for each fund that would be achieved under these conditions.

Chart 2: Cumulative simulated returns for each hypothetical fund (based on ±2% monthly returns)



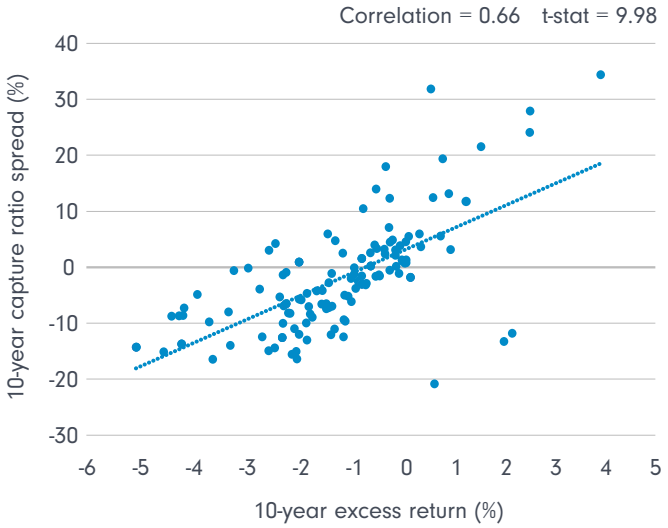
Source: Fidelity International, 2019.

If you initially thought Fund B would have had the best results, this example demonstrates that despite equal changes in the upside and downside capture ratios, the improvement in the downside capture ratio produces better results.

The capture ratio spread and its relationship to excess returns

Investors hope to find an investment manager that can outperform the benchmark in both rising and falling markets. Of course, this is extremely difficult to do over a long period of time. However, the calculation of the **upside/downside capture ratio spread** (the gap between upside and downside capture) indicates the extent to which a fund participated in up markets and protected in down markets. An analysis of funds listed in the Morningstar Australia Fund Equity World Large Blend category indicates that **there is a strong relationship between higher capture ratio spreads and excess returns**.

Chart 3: Scatter chart of 10-year excess returns vs capture ratio spread



Source: Fidelity International, Morningstar Direct. Australia Fund Equity World Large Blend category, ten-year period ending 30/06/2019. The capture ratio spread measures the difference of the up capture ratio and down capture ratio. The up (down) capture ratio is calculated by compounding and annualising the monthly returns for a fund and the index in periods when the index was up (down). The annualised return for a fund is divided by the annualised return of the index to produce the capture ratio for corresponding up/down market performance periods. A total of 120 monthly returns were analysed; of these 75 were up markets, while 45 were down markets.

The above chart compares the ten-year excess return of each fund in the Morningstar Australia Fund Equity World Large Blend category to the capture ratio spread realised during the same period. Each dot represents a fund and plots the intersection of its ten-year capture ratio spread (vertical axis) and its ten-year excess return over the MSCI ACWI ex Australia Price Index (horizontal axis). The correlation between the capture ratio spread and excess return in this sample was 0.66, indicating that these two variables were positively correlated. In other words, a higher average capture ratio spread is positively related to higher excess return. This suggests that during this ten-year period, funds with higher capture ratio spreads tended to perform better than funds with lower capture ratio spreads. Intuitively, this makes sense, since the capture ratio reflects an investment's relative net overall performance over a period of time which normally includes both up and down markets.

Table 2: Average capture ratio spread per quartile

Quartile	Median excess return (%)	Median capture ratio spread (%)
1	0.2	3.5
2	-0.7	-1.5
3	-1.6	-7.1
4	-2.8	-8.8
Top decile	1.3	12.3
Bottom decile	-4.2	-11.8

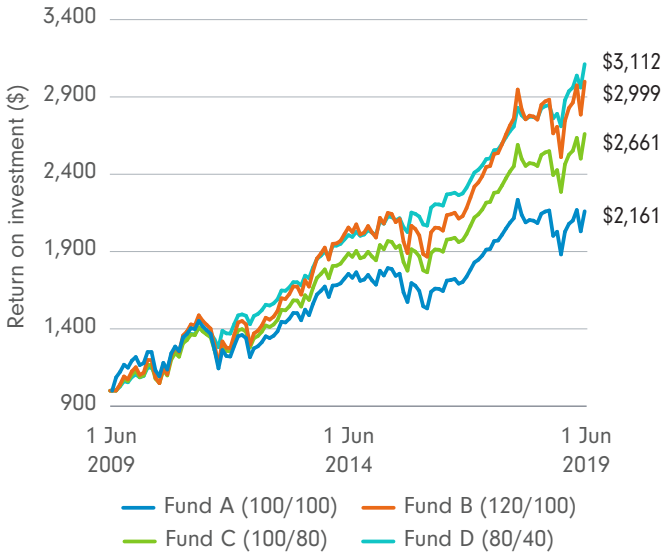
Source: Fidelity International, Morningstar Direct. Australia Fund Equity World Large Blend category, ten-year period ending 30/06/2019.

In Table 2, the category is split into quartiles and the top/bottom decile (1 being the best and 4 being the worst, ranked by median excess return). Notice the funds that have better excess returns also have better capture ratio spreads. The relationship between excess returns and capture ratio spreads is most pronounced when the top and bottom deciles are analysed.

Hypothetical performance of funds with varying capture ratio spreads

Chart 4 illustrates the importance of the capture ratio spread. The above chart, which uses the historical performance of the MSCI ACWI ex Australia Price Index and the upside/downside capture ratios used in the previous example, shows that while Fund C continues to outperform the index, Fund B exhibits the best performance. As the predominant market scenario over the past 10 years has been a rallying market, the downside capture signal is more muted. **In a market that is rising, a strong upside ratio can be vital in generating outsized gains relative to an index.** A rising market has been the dominant characteristic over the last ten years. Out of 120 monthly observations, there were 75 months where the market had risen, and 45 months occasions were the market had fallen.

Chart 4: Cumulative simulated return for each hypothetical fund (based on historial MSCA ACWI ex Australia Price Index returns

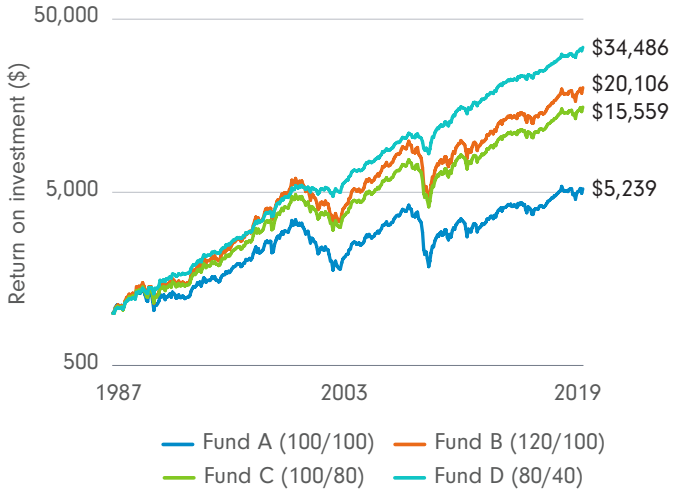


Source: Fidelity International, Bloomberg, 2019.

Fund D, which has an upside/downside capture ratio of 80/40 and a capture ratio spread of 40%, illustrates that it isn't necessary for an investment to capture over 100% of upside gains in order to perform well over time. By limiting the downside with a superior downside ratio of 40%, whilst capturing 80% of any increase in the index, the Fund experiences better performance with a lower level of volatility and a smoother ride.

Looking over a longer time horizon highlights the benefits of downside risk mitigation during periods of risk aversion and market sell-offs. Using the entire history of returns for the MSCI ACWI ex Australia Price Index encompasses the aftermath of the tech bubble, the global financial crisis, and the European debt crisis. Whilst the market has experienced more up than down months, meaning a 120/100 fund outperforms, the value of a managed volatility approach is significant relevant to the index. In addition, a $1000 portfolio with characteristics of 100/80 would be worth $15,559 today versus $5,239 (Fund A) for a passive investment in the index over the same time period. Again, Fund D, with a higher capture ratio spread of 40%, generates excellent risk-adjusted returns and a final value of $34,486.

Chart 5 (log scale): Cumulative simulated return for each hypothetical fund (based on historical MSCI ACWI ex Australia Price Index returns 31 December 1987 – 28 June 2019)



Source: Fidelity International, Bloomberg, 2019.

There are specific periods, such as the multi-year bull market following the global financial crisis, when the significance of downside protection becomes muted. Intuitively, this would seem reasonable, as an investor would be less concerned about protecting capital if markets are rising consistently, with fewer periods of material downward corrections. However, **it may not be prudent to rely on a permanent bull market in the future**, as the equity market losses experienced in 2018 suggest that, as market conditions normalise, the significant benefit of downside protection quickly returns to the forefront.

For passive investment vehicles, such as exchange-traded funds (ETFs) that track market indices, their upside and downside capture ratios will be close to 100% relative to the reference market index. This is because passive investment vehicles are designed to simply track the market movements in the reference index. Since actively managed funds have the potential to realise downside capture ratios less than 100%, **this trait allows them to outperform passive investment vehicles and potentially generate greater investment wealth over the medium and long term.**

Concluding remarks

Investors should consider incorporating the upside and downside capture ratios into their evaluation of the return attributes that an investment manager can achieve. This paper shows that there is a statistically significant positive relationship between the capture ratio spread and excess returns. Capture ratios are a useful tool to help evaluate the performance attributes of an investment fund. If a portfolio manager suggests that his or her investment strategy focuses on downside protection to assist in producing excess returns, then these metrics can be used to help validate that claim.

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1 In this analysis, a t-test was also used to determine the statistical significance of the correlation. The t-value, which measures the magnitude of difference relative to the variation in the data, was calculated to be 9.98. the greater the magnitude of the t-value (in absolute terms), the greater the evidence that the sample is statistically significant and not random chance. A 99% confidence level was used as the threshold for determining whether the relationship was statistically significant. The critical value associated with a 99% confidence level is 2.33. As the t-value of 9.98 is far greater than the critical value of 2.33, the relationship is considered to be statistically significant at the 99% confidence level.