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ADDING PROTECTED STRATEGIES INTO PORTFOLIOS

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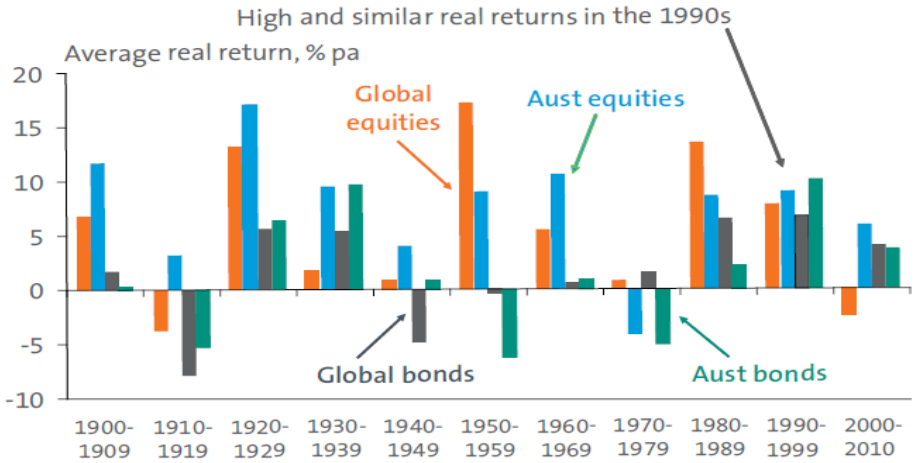
Academic research has begun to acknowledge the significant impact of outliers on terminal portfolio values, and that the common practice of normalising distributions to measure the likelihood of outliers fails to account for their frequent occurrence. These findings have not yet filtered into commonly used portfolio construction principles and management techniques. Many think it is too difficult to implement TAA, and that downside protection is principally achieved via diversification. This research paper argues that, going forward, it is vital to consider the market environment, and latest academic research, and develop a better approach to TAA and downside risk protection, including using second generation capital protected strategies to help create more robust portfolios.

Lessons from the past – should tactical asset allocation be back in vogue?

Everything comes in cycles, and one of the big swings in investment management relates to the perceived importance of tactical asset allocation ("TAA"). Throughout the 1990s and into the last decade, the investment management industry increasingly moved away from worrying about TAA to focusing on manager selection. This came about for several reasons:

- As illustrated by Chart 1, real returns from most asset classes were very high during the 1980s and 1990s, reflecting the effects of falling inflation, deregulation and globalisation. Buy and hold – virtually anything - worked well. "Time in, not timing the market" became the mantra. For the most part, long only investing served investors well.

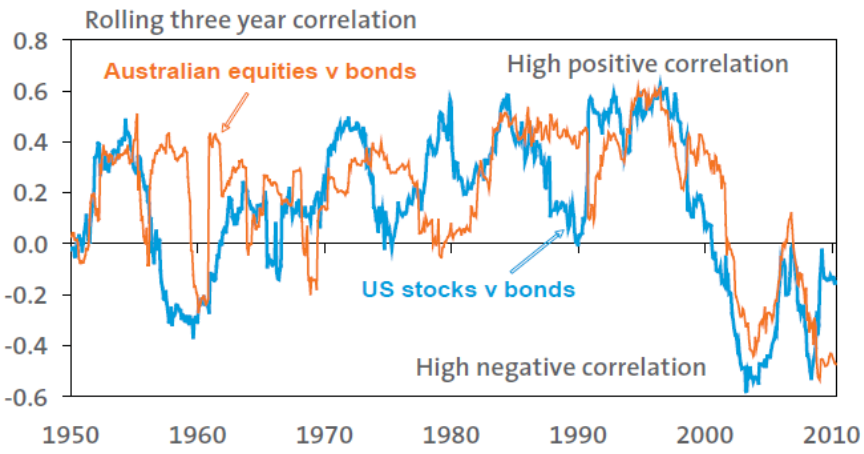
Chart 1 – High and similar real returns in the 1980s and 1990s



Global returns are in US$. Source: E.Dimson, P.Marsh & M.Staunton, Global Investment Returns Yearbook, London Business School/ABN AMRO 2003. AMP Capital Investors.

- As Chart 2 illustrates, bonds and equities were positively correlated for most of the 1980s and 1990s as they were both driven by the fall in inflation and inflationary expectations (the "Goldilocks period"). This gave little scope for asset allocation to enhance returns because the main asset classes all moved in line anyway. There was little or no need for alternative investments, and little ability to access them at a retail level in any case.

Chart 2: Correlation of monthly equity and bond returns



Source: Global Financial Data, Datastream and AMP Capital Investors

- There was a perception that it was too difficult to enhance returns from TAA. As Faff, Gallagher and Wu (2005) discuss, the track record of diversified funds adding value from TAA was relatively poor[1]. Coupled with this was the move from appointing balanced funds to sector specialists in portfolio construction, and consequently removing the strategic asset allocation decisions from fund managers to asset consultants.

- In addition, the process of implementation was flawed. As Grinhold (1989) noted, managers with skill should be free of constraints – "breadth" is his expression for this. Basically, the more opportunity the manager has, the more good picks he can discover – so why do we restrict a skilled manager's search for opportunity to one class of shares or bonds? In other words, the more "breadth", the merrier the outcome, assuming we start with a manager who has skill in the first place.

- Finally, there was the view that investment markets were efficient and so, regardless of the starting point, the risk premium between asset classes held true. Therefore, regardless of

[1] Faff, Gallagher and Wu (2005) analysed the performance of multi-sector funds over the period December 1989 to February 2001. Oliver (2010) suggests provides a qualitative assessment as to why the tactical asset allocation capabilities of Australian fund managers were considered poor - primarily because the decision-making was undertaken by sector specialists who lacked the skill to assess the relative return potential between asset classes and the decisions were driven by a consensus approach which led to weak decisions and group think.

whether you bought shares before or after a big fall, their long-term return potential relative to bonds would be the same.

However, the investment management landscape changed post tech-wreck and is changing again. As a consequence, TAA as a tool in portfolio construction looks to be making a comeback.

- Firstly, post 'tech-wreck' the investment outlook was more constrained, and this has been since reinforced by the latest bear market and the mediocre investment returns over the last five to ten years (see Chart 1). It is likely that this constrained outlook will remain in the medium-term, given the tailwinds of falling inflation, deregulation and globalisation are now behind us and we now have to deal with the problems flowing from both high household and public sector debt. Anything that can improve returns – including TAA – will be far more valuable than when average returns were much higher.

- In addition to the constrained return outlook, cyclical swings in asset classes are becoming more evident. Chart 2 shows that the correlation between equities and bonds has fallen to negative levels in the last 18 months to mid-2010 after being positive throughout the 1980s and 1990s. Whilst market volatility has been less of an issue for Australia over the past decade [2] it is progressively becoming a much greater issue as Australia is very exposed to commodities, and commodities have become more central to the global boom-bust cycle. So, if economic cycles are becoming shorter and more extreme, correlations between equities and bonds remain negative, and medium-term investment returns are more constrained then this will provide more opportunities for TAA to add value. In short, a 1990s style 'buy and hold' strategy won't work so well.

- More asset classes are now available which has expanded the scope for TAA to add value (ie. emerging market equities and bonds, infrastructure, commodities, currencies and various alternative asset classes that make use of "breadth").

- Finally, the 'tech-wreck' and global financial crisis have overturned the belief that investment markets are efficient and as Oliver (2010) points out, it is now commonly accepted that irrational investors can create significant volatility in asset classes which alter their relative return potential.

As a result of all these considerations, the role of TAA should rightfully be back in vogue. However, before exploring the academic evidence around how best to implement TAA, below is a re-cap of other options to improve returns in a world of higher volatility and potentially lower investment returns.

[2] Volatility was more noticeable in Europe and the US over the past decade (particularly during the 'tech-wreck' bear market) as Australia wasn't really exposed to the assets at the centre of the technology bubble.

Lessons from the past – A re-cap on how to improve investment returns in a world of higher volatility and lower returns

The investment outlook may not be all that bright, but over the past decade investors have had three (and a half) ways to improve investment returns[3]:

1. *Expand asset class selection*: investors need to look beyond long-only equities and bonds. A whole spectrum of asset class opportunities exist with varying degrees of correlation to one another – particularly amongst the alternative asset classes.

2. *Seek alpha*: That is, try to identify managers who can outperform long-only equities and bonds. Or, if the investor has no skill in identifying those superior managers in advance, at least shut off the pain by avoiding negative alpha. The identification of skilled managers has always been challenging in a mobile labour market for investment management expertise, particularly the trend for investment managers to establish boutique firms, and requires vigilance.

3. *Actively manage asset allocation*: move out of markets that are popular, trendy and accordingly are priced to provide lower future returns and move into markets that are attractively priced (often because they are out of favour and uncomfortable to invest in). This really requires a systematic process.

4. *Use leverage*: this is the "half". Certainly investors can take all three paths in parallel. Those who are really adventuresome could choose all "four" approaches by leveraging the other three.

Arguably, all options - with the exception of tactical asset allocation – have been adopted by most investors to varying degrees over the past five years, with varying success. Yet TAA – implemented well - is one of the key drivers of an investor's overall return. How can it be implemented well? To answer this question, we need to gain a better understanding of how investors obtain their long-term returns and how they can best predict when to be in and out of the market. Do investors obtain their long term returns smoothly and steadily over time, or is their long term performance largely determined by the return of just a few outliers? Are investors likely to succeed in predicting the best days to be in and out of the market? Is there a simpler and less risky way that investors can implement portfolios to capture or minimise the impact of outliers and volatility over the longer term without significantly affecting their returns? Is there a systematic way to do this?

Recent academic literature, in particular the research that flows from questioning the validity of assuming returns are normally distributed and the impact of black swan events, provides the answers to most of these questions.

[3] Arnott (2004) noted these possibilities, although arguably the full combination wasn't available to the Australian retail market over the past decade.

Academic literature – the Normality assumption and the impact of Black Swans

"Measures of uncertainty that are based on the bell curve simply disregard the possibility, and the impact, of sharp jumps...Using them is like focusing on the grass and missing out on the (gigantic) trees. Although unpredictable large deviations are rare, they cannot be dismissed as outliers because, cumulatively, their impact is so dramatic." Taleb (2007).

Taleb (2007) defines a black swan as an event with three attributes:

1. It is an outlier, lying outside the realm of regular expectations because nothing in the past can convincingly point to its occurrence;
2. It carries an extreme impact; and
3. Despite being an outlier, plausible explanations for its occurrence can be found after the fact, thus giving it the appearance that it can be explainable and predictable.

In short, a black swan has three characteristics: rarity, extreme impact, and retrospective predictability.[4]

Now consider Black Monday. As Estrada (2008) notes, between its inception on 26 May 1896 and 16 October 1987, the Dow had only fallen by more than 10% on any one day two times – in the midst of the 1929 crash (28 and 29 October 1929) – by 12.8% and 11.7% respectively. Nothing in the history of the Dow pointed to the possibility of a fall as large as 22.6% on 16 October 1987. However, the unexpected and unimaginable happened. This fall wiped out the return from the previous 201 trading days in one single day. It took the Dow 320 trading days to get past the level of 2246.7 on 16 October 1987; on 24 January 1989 it closed at 2256.4[5]. Black Monday was an extremely rare event; it did have a very significant impact on investors' portfolios, and many stories described its causes after the event. In short, Black Monday was a black swan event.

Black Monday was the single worst day (in percentage terms) in the Dow's history, and therefore unique. However, what is neither unique nor unusual is that a few large daily swings can destroy the return of a portfolio obtained over a long period of time. Interestingly, under the widely used and abused assumption of normality, this should happen very rarely, if at all. Yet the evidence shows that these events happen far more often than would be expected under this assumption[6]. Still, whether daily returns follow a normal distribution is fundamental to this discussion, simply because the large daily swings in investment markets that we frequently experience, have a negligible probability of occurring under the assumption of normality.

[4] The term black swan is often informally used as a metaphor for something very rare. Its origin stems from the fact that, as far as the Western world was concerned, the hypothesis that all swans were white was an unquestionable statement supported by countless sightings of white swans over many centuries. That belief changed in a single moment, when the Dutch explorer Willem de Vlamingh recorded a first sighting of black swans in Western Australia in January 1697. It took this one sighting to invalidate a belief supported by centuries of evidence.

[5] Bloomberg database.

[6] This article is not about testing for the normality of selected assets, as was done in the pioneering work of Mandelbrot (1963) and Fama (1965) or finding the distribution that best fits the returns of selected assets as done in Aparicio and Estrada (2001).

There have been a number of empirical studies that suggesting that returns should not be expected to be normally distributed. Mandelbrot (1963) and Fama (1965) were key to initiating this debate. Since these initial studies, the normality of stock returns has been rejected in favour of fat-tailed distributions in a wide variety of markets, assets and time periods (see Jansen and de Vries (1991), Aparicio and Estrada (2001)and Longin (2005)). Mandlebrot and Hudson (2005) proposed to abandon the normality assumption and replace it with a fractal view of risk, ruin and reward. In their proposed framework, large swings follow a power law and are therefore far more likely (and clustered) than what a normal distribution would predict.
The assumption of normally-distributed returns is pervasive in finance; it is widely used and abused, implicitly or explicitly, by both academics and practitioners. However, the evidence of the last 40+ years clearly disputes the plausibility of this assumption. Unfortunately, many widely-used measures of risk stem from the normality assumption and basically exclude the possibility of black swans. The fractal framework suggested by Mandlebrot and Hudson (2005) does not solve the problems created by black swans, but at least it makes them plausible.

Academic literature – the Impact of large swings on portfolio performance

The idea that outliers are far more often observed than what the normality assumption would predict is not new. Mauboussin (2006) argues that over the 3 January 1978 – 31 October 2005 period, the S&P500 delivered a mean annual return of 9.6%; excluding the best 50 days (out of over 7,000) lowers the mean return to 2.2%, and excluding the worst 50 days increases the mean return to 18.4%. Browne discusses a study by Sanford Bernstein showing that during the 1926-93 period, the returns of the US stock market in the best 60 months (7% of the time) averaged 11% whereas the returns of the rest of the months (93% of the time) averaged 0.01%. He also discusses a study by American Century Investments showing that $10,000 invested in the US stock market in 1990 turned into $51,354 by 2005, but missing the best 10, 30 and 50 days would have reduced the terminal wealth to $31,994, $15,730 and $9,030.

Similar studies have been conducted by fund managers in Australia. Perhaps the best known is a phrase coined by MLC Investments “time in the market, not timing the market”. Illustrations of this in the Australian market have been reproduced by AXA, MLC and Zurich. The AXA study shows the average return of the ASX S&P 300 Index was 10.6% over the 10 years to 30 June 2008, but missing the best 10, 20, 30 and 40 days would have reduced the returns to 8.3%, 6.9%, 5.6% and 4.4% respectively. MLC uses the All Ordinaries Accumulation Index (to December 2003)/S&P ASX 300 Accumulation Index to show that missing the best 10 days can “cost you big time” - a terminal value of just $23,250 rather than $38,008. Zurich recreates a similar story.

Academic Literature – the evidence: International Markets, 1990 – 2006[7]

Estrada (2008) assessed the impact of outliers on long term performance, focusing initially on the US market and then an additional 14 global equity markets, reviewing more than 160,000 daily returns and reaching back between 31 to 79 years (data permitting). The results showed that on average, across all 15 markets:

- missing the best 10 days resulted in portfolios 50.8% less valuable than a passive investment; and
- avoiding the worst 10 days resulted in portfolios 150.4% more valuable than a passive investment.

Given that 10 days, in the average market, represented less than 0.1% of the days considered, Estrada (2008) initially concluded the odds against successful market timing to be "staggering". A negligible proportion of days determined a massive creation or destruction of wealth.

He then went on to test the more recent period of 1990 to 2006 given the length of time previously tested was considered too long to represent a reasonable holding period for investors. The 17 year period between 1990 and 2006 was deemed long enough to assess long term performance, yet short enough so it could actually be the holding period of many investors.

Estrada calculated the number of outliers, defined as those daily returns more than three standard deviations away from the mean. As was the case in the longer sample periods, in all 15 markets the outliers observed clearly outnumbered those expected, on average by a factor larger than five. Interestingly, the best and worst 10 days were, on average, close to five standard deviations away from the mean. Events of this magnitude have a probability of occurring under the normal distribution assumption once in every 13,954 years. Booms and busts occur far more frequently than the normality distribution would predict and overall, assuming normally distributed returns would have led investors to substantially underestimate risk in all markets.

The most interesting observations come from Table 1, which shows the terminal values and mean annual compound returns of a passive investment, as well as the impact on terminal wealth of not being invested during the best and worst 10, 20 and 100 days in each market. Panel A shows the terminal wealth resulting from passively investing 100 units of local currency over the stipulated time frame. Panel B shows the impact on terminal wealth resulting from not being invested during the best 10, 20 and 100 days. Panel C shows the mean annual compound returns of a passive investment, as well as those resulting from not being invested during the best and worst 10, 20 and 100 days.

Table 1: Terminal Values
(1990 – 2006)

[7] The evidence has been derived from the work of Estrada (2008).

Panel A: Terminal Values

Panel A shows the terminal value of 100 units of local currency (TV100) invested on 31/12/1989 and held passively to 31/12/2006, not including dividends; such terminal value without being invested during the best 10, 20 and 100 days (-B10, -B20 and –B100); and such terminal value without being invested during the best 10, 20 and 100 days (-W10, -W20, -W100).

Market	TV 100	- Best10	-Best20	- Best100	- Worst10	- Worst20	- Worst100
Australia	342	253	201	48	524	667	2,881
Canada	325	219	159	30	549	765	4,995
France	294	170	114	12	504	767	8,801
Germany	368	187	108	7	745	1,291	28,180
Hong Kong	704	290	165	7	1,782	3,345	81,814
Italy	291	173	118	11	547	883	11,370
Japan	44	22	13	1	81	134	2,378
New Zealand	170	108	81	15	294	402	2,156
Singapore	202	107	70	7	382	606	6,119
Spain	524	314	210	20	975	1,522	16,528
Switzerland	461	270	184	26	802	1,233	11,463
Taiwan	81	41	22	0	165	322	25,300
Thailand	77	30	14	0	196	388	13,372
UK	267	173	125	20	417	588	4,140

Source: Estrada 2008

Panel B: Variation in Terminal Values

Panel B shows the percent changes of these last six terminal values with respect to TV100.

Market	- Best10	-Best20	- Best100	- Worst10	- Worst20	-Worst100
Australia	-26.0%	-41.2%	-86.1%	53.0%	95.1%	742.1%
Canada	-32.6%	-51.2%	-90.6%	68.8%	135.3%	1436.1%
France	-42.1%	-61.4%	-95.9%	71.6%	160.9%	2894.3%
Germany	-49.3%	-70.7%	-98.2%	102.2%	250.5%	7547.9%
Hong Kong	-58.8%	-76.6%	-99.0%	153.2%	375.3%	11524.1%
Italy	-40.4%	-59.5%	-96.1%	88.2%	204.0%	3811.8%
Japan	-51.4%	-70.6%	-98.3%	83.8%	202.6%	5273.2%
New Zealand	-36.3%	-52.4%	-91.3%	72.5%	136.2%	1166.6%
Singapore	-47.0%	-65.3%	-96.3%	89.5%	200.3%	2933.0%
Spain	-40.1%	-59.9%	-96.1%	86.0%	190.5%	3054.7%
Switzerland	-41.4%	-60.1%	-94.5%	74.1%	167.7%	2388.9%
Taiwan	-49.2%	-73.1%	-99.5%	102.7%	296.6%	31021.8%
Thailand	-61.5%	-82.2%	-99.6%	153.1%	401.8%	17192.8%
UK	-35.4%	-53.3%	-92.5%	55.9%	119.8%	1448.4%
USA	-37.7%	-57.1%	-94.4%	63.8%	129.7%	1591.8%
AVERAGE	**-43.3%**	**-62.3%**	**-95.2%**	**87.9%**	**204.4%**	**6268.5%**

Panel C: Mean Annual Compound Returns

Panel C shows the mean annual compound returns in all the scenarios considered. Source of the tables: Estrada (2008).

Market	TV100	- Best10	-Best20	- Best100	- Worst10	- Worst20	- Worst100
Australia	7.5 %	5.6%	4.2%	-4.3%	10.2%	11.8%	21.9%
Canada	7.2 %	4.7%	2.8%	-6.7%	10.5%	12.7%	25.9%
France	6.5 %	3.2%	0.8%	-11.7%	10.0%	12.7%	30.1%
Germany	8.0 %	3.7%	0.5%	-14.7%	12.5%	16.2%	39.4%
Hong Kong	12.2 %	6.5%	3.0%	-14.3%	18.5%	22.9%	48.4%
Italy	6.5 %	3.3%	1.0%	-12.0%	10.5%	13.7%	32.1%
Japan	-4.7 %	-8.6%	-11.3%	-25.1%	-1.2%	1.7%	20.5%
New Zealand	3.2 %	0.5%	-1.2%	-10.6%	6.5%	8.5%	19.8%
Singapore	4.2 %	0.4%	-2.1%	-14.2%	8.2%	11.2%	27.4%
Spain	10.2 %	7.0%	4.5%	-8.9%	14.3%	17.4%	35.0%
Switzerland	9.4 %	6.0%	3.6%	-7.7%	13.0%	15.9%	32.2%
Taiwan	-1.2 %	-5.1%	-8.6%	-27.3%	3.0%	7.1%	38.5%
Thailand	-1.5 %	-6.9%	-11.0%	-28.7%	4.0%	8.3%	33.4%
UK	6.0 %	3.3%	1.3%	-9.0%	8.8%	11.0%	24.5%
USA	8.5 %	5.5%	3.2%	-8.4%	11.7%	14.0%	28.2%
AVERAGE	**5.5 %**	**1.9%**	**-0.6%**	**-13.6%**	**9.4%**	**12.3%**	**30.5%**

Source: Estrada 2008

Key findings

Panel A:

- If you missed the best 100 days in Taiwan and Thailand your terminal wealth was less than your initial capital invested.
- If you missed the best 100 days in Japan, Germany, Hong Kong and Singapore your terminal wealth would be less than 10% of your initial capital invested.
- Australia fared the best out of all 15 countries - missing the best 100 days resulted in losing just over 50% of initial capital invested.

Panel B:

- On average across all 15 markets, if you missed the best 10, 20 and 100 days your portfolio reduced in value by 43.3%, 62.3% and 95.2% in terminal wealth relative to a passive investment. The equivalent impact on an Australian investment is a reduction of 26.0%, 41.2% and 86.1%. The 10, 20 and 100 days are only 0.23%, 0.47% and 2.34% of the total number of days considered, so there is a massive impact on long term performance from just a small number of days.
- However, avoiding the worst 10, 20 and 100 days produces the most staggering results. By doing this, you increase your terminal portfolio value by 87.9%, 204.4% and 6,268.5% relative to a passive investment. The equivalent impact on an Australian investment is 53.0%, 95.1% and 742.1%.

Panel C:

- Across all 15 markets, and relative to a passive investment, missing the best 10 days reduces the mean annual compound returns by over 3% to 1.9%; missing the best 20 days results in negative mean annual compound returns in 5 markets and, on average across all markets; and missing the best 100 days (2.34% of days considered) resulted in negative mean annual compound returns in ALL markets.
- Avoiding the worst 10 days, in turn, increased mean annual compound returns by almost 4% to 9.4%; avoiding the worst 20 days resulted in more than doubling the mean annual compound returns to 12.3%; and avoiding the worst 100 days resulted in mean annual compound returns of 30.5%, over 5 times higher than those of a passive investment.

Large daily swings clearly have a significant impact on long term performance outcomes. Although unexpected beforehand, they are often explainable after the fact, and occur far more than the normality assumption would have investors believe. Black swans do exist. In fact investors stumble upon them far more than they expect, and the impact on their portfolios is far larger than they usually think. On average across all 15 markets, missing the best 10 days resulted in portfolios 50.8% less valuable than a passive investment; yet avoiding the worst 10 days resulted in portfolios 150% more valuable than a passive investment. For the average market, less than 0.1% of days considered swung long term portfolio returns by more than 50% above or below those of a passive investment.

Implications for portfolio construction

The results achieved by Estrada's (2005) research implies several recommendations that apply to portfolio construction. All stem from the fact that black swans are largely unpredictable and have a significant impact on long term performance:

- Taleb (2007) recommends adjusting for the existence of black swans rather than trying to predict them. It is possible to have an idea of the consequences to an event even if its probability of occurring is largely unknown. It is on these potential consequences that investors should focus. For example, broad diversification would mitigate exposure to negative black swan events while preserving some exposure to positive black swans, as would some capital protection. As the real wealth destruction occurs from negative black swan events, you need to build some safeguards into client portfolios.

- Black swans render market timing extraordinarily difficult if not impossible for investors. Estrada (2005) demonstrated that if you could somehow avoid the worst 100 days in the markets (or even 10 days) over the longer term, your portfolio outcomes would be substantially better than avoiding the best 100 (or 10) days. Either produced a better result than simply sitting in the passive portfolio. This understanding will clearly tempt some investors to market time. There is clearly good money to be made by getting it right. Yet logic tells us that given that a very small number of days account for the enormous creation and destruction of wealth, the likelihood of successfully predicting the right times to be in and out of the markets is slight. Mandlebrot and Hudson (2005) noted that large swings in either direction tend to be clustered, so market timing is even more difficult under these circumstances. Focusing on managing the TAA in conjunction with the downside risk seems to provide the best outcome for clients. Advisers could achieve this

by including TAA trusts in portfolios, performing the TAA themselves, and implementing some form of capital protection, or a combination of all options. If it was possible to manage TAA and provide downside protection systematically and well, the academic evidence suggests it would have enormous benefits for portfolio returns.

Using TAA and providing downside risk protection in portfolio construction – can capital protected funds provide a solution?

In practice, an adviser may use some or all of the options I've listed above to manage the tactical asset allocation and downside protection of a client's portfolio. TAA trusts have been available to retail investors for the past decade[8], and have evolved significantly in their sophistication over that time to incorporate more breadth[9]. Advisers performing TAA themselves with client portfolios create an array of compliance concerns for their dealer groups, and practically speaking, find it difficult to implement without continuous monitoring of the markets and sophisticated software that has the ability to pool and equitably allocate the buys and sells across all client portfolios. An alternative solution, that can involve TAA and downside protection, lies in capital protection.

In general, capital protection can be implemented in three ways, each with its benefits, risks and client suitability[10]:

1. *Buy a put option* over the asset with the exercise price struck at the desired level of protection. This can be expensive and create a performance drag but the client retains full exposure to the underlying asset at all times. Dividends can be passed through to investors as they hold the assets directly. AXA North uses a variation on this style of put option, and suffers from high costs as a result. Derivatives can be effective in protecting downside risk, and relatively easy to implement (provided the dealer group has the licence to do so) but require tailoring and monitoring by the adviser. This method provides downside protection, but no TAA.

2. *Combine a zero coupon bond with call options* to synthetically replicate the underlying asset but with zero or only partial downside risk. In "bond + call" products, if the call option is at the money and provides 100% or greater participation in the upside of the underlying asset, the client receives full exposure to the underlying asset and no downside. However, dividends are not normally passed through to investors as options do not normally pass these on to investors. This can issue can be mitigated by using total return indices or accumulation indices to hedge the synthetic product, although clients lose the benefit of claiming franking tax. Once again, this method provides downside protection, but no TAA.

3. *CPPI* products can provide full exposure to the underlying asset (either synthetically or physically) with the prospect that in falling markets the exposure can be reduced to zero. The major

[8] Citigroup Tactical Allocation Trust was available to platform investors from around 1995.
[9] Grinhold (1989) measure breadth as the number of times that a manager's skill is applied in a year. BGI's Scientific Markets Fund was marketed by them as a third generation TAA trust with "depth" and was available to retail investors via platforms from as early as 2000.
[10] For a more detailed discussion see Rumble, T., (2009), "Why does Capital Protection Have to be so Hard?", www. alpha-invest.com.au/research—education/articles, downloaded 5/07/10.

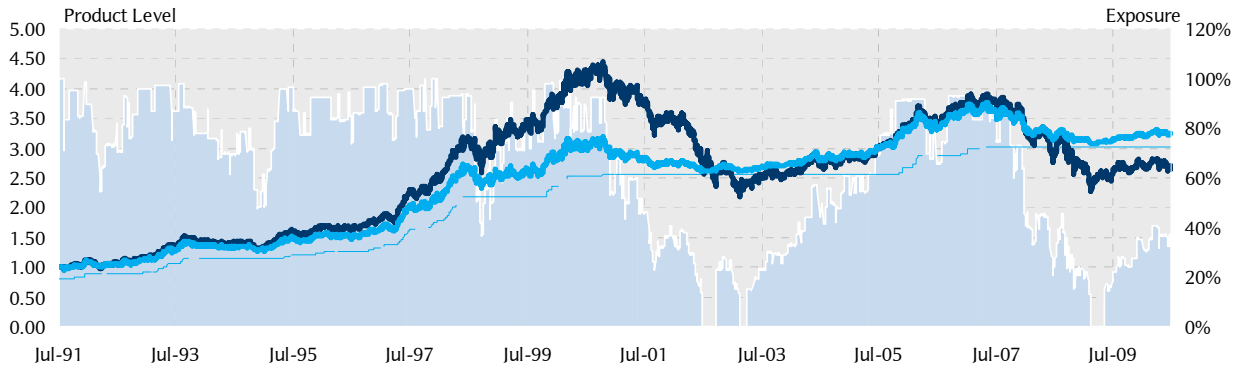
drawback for CPPI historically has been that when the product de-leverages to zero, further exposure to the underlying asset and any cashflows arising from it are reduced, potentially to zero. Other issues include the difficulty of incorporating closed-end structures into mainstream portfolios, the illiquidity of the structures and break-costs incurred if exiting early, their expense, the inability of some platforms to cater for these structures, the complexity and lack of transparency of the underlying assets and the structure itself and the fact that protection only applies on the maturity date. Yet, aside from these issues, CPPI technology does manage TAA and provide downside protection.

To overcome these shortcomings, second generation capital protected products have been developed and have recently become available to retail investors. These funds are open-ended and daily priced, thereby enabling easy incorporation into a portfolio via a platform. The products provide rising lock-in capital protection that is applied daily. Depending on the degree of protection used and the underlying assets, the funds have reasonable fees (and no break costs)[11] . The underlying assets can be securities, funds and/or synthetically derived however more recently issued funds have simple underlying assets that slot cleanly into part of a client's portfolio. They provide full transparency on the underlying assets and costs involved and don't get cash locked. They can allocate wholly into cash, but have the ability to re-lever into the underlying assets (albeit slowly) provided those underlying assets increase in value from their nadir. They look and feel like a traditional managed fund, however they systematically manage TAA and provide partial capital protection. In effect, they are a good solution for providing a systematic approach to TAA and giving downside protection from black swan events and large market swings. In the event of a black swan, the risk is born by the offeror, not the client.

By way of example, and sticking with the international market theme, Chart 3 illustrates the MSCI World Index from December 1990 to July 2010 and applies second generation CPPI technology with protection set at 80% of the highest value ever reached (called DYNAMIC80)[12].

[11] Generally speaking, 100% protection of the daily unit price is expensive with this structure, but 80% provides a good trade-off for protection and cost.
[12] The money market rate is assumed to be 4% over the entire period, and the maximum multiplier is assumed to be 5.5 times.

Chart 3: DYNAMIC80 strategy on MSCI World Index in AUD, 1990-2010



Dark blue line = MSCI World Total Return Index, net dividends reinvested, in AUD
Light blue line = DYNAMIC80 Strategy on MSCI World Total Return Index
Light blue dotted line = Protection amount
Blue shaded bars = allocation to the MSCI World Total Return Index under the DYNAMIC80 Strategy

AUD	Annualised Return	Annualised Volatility	NAV as of Jul-10	Protected Amt. as of Jul-10
MSCI World TR	5.28%	15.91%	265.75%	0.00%
DYNAMIC80	6.37%	9.81%	323.67%	301.17%

Source: Barclays Capital, Bloomberg

There are several conclusions to be drawn from this chart:

- Whilst the average allocation to the MSCI World Total Return Index is generally lower within the DYNAMIC80 structure, volatility is significantly less at 9.8% compared t 15.9%, and this contributes to the DYNAMIC80 structure having superior risk-adjusted returns compared to a direct investment.

- From the chart, it is clear that in a rising market the DYNAMIC80 structure would not increase as quickly as a direct investment due to the potential of having a lower exposure than the direct investment. A small cash buffer is often required to provide a cushion from large daily market swings and re-leveraging depending on the interest generated from the cash investment and the performance of the MSCI World Index.

- Whilst the "gap" protection was not triggered, there were several occasions where the severe drop in the value of the MSCI World Index meant this was close to eventuating –in 2001-2003 (twice) and 2009 – black swan events. The DYNAMIC80 strategy recovered from these events.

- Long term returns are around 1%p.a. higher for the DYNAMIC80 structure and the MSCI World Index, and the DYNAMIC80 strategy has delivered these returns with less unit price volatility plus

rising capital protection over time. The terminal protected value in this example was 301.17% of initial capital invested.

Conclusion

The lessons from the past suggest TAA as a tool in portfolio construction should be making a comeback. It is one of the key areas where investors can improve their investment returns in an era of higher volatility and lower returns. The academic literature discussed above in sections 4-6 has shown that large daily swings and black swan events play a significant role in destroying terminal portfolio value, and that by avoiding the worst 10 days in markets, we can do much better than participating in the best 10 days or remaining passively invested. The practicalities of implementing a process to capture this knowledge are quite daunting, particularly given that adverse market movements are usually unexpected beforehand, even though they are often explainable after the fact. The academic research presented backs up what investors already know here – large daily swings and black swan events occur far more than the normality assumption, so often adopted in finance.

Whilst there are several ways for investors to implement TAA and capture downside protection in portfolio construction, second generation capital protection using CPPI technology wraps TAA and downside protection into one easily accessible solution. This seems to provide the lowest risk entry point for an investor to incorporate these findings into their portfolios. In using the DYNAMIC80 structure, clients have the risk transfer, or insurance, in the case of a black swan event; the management of large market swings on the downside (with no cap on participation in the upside swings) via the provision of systematic TAA services; and a format that complements an adviser's existing business model by using an open-ended managed fund that can be used on a platform, incorporated into an ongoing Recommended Portfolio allocation and provide comparatively little compliance risk. Second generation CPPI strategies should play a key role in portfolio construction and over the next decade.

BIBLIOGRAPHY

Aparicio, F. and Estrada, J., (2001), "Empirical Distributions of Stock Returns: European Securities markets, 1990-95", *European Journal of Finance,* 7, pp.1-21.

Arnott, R.D., 2004, "Managing Assets in a World of Higher Volatility and Lower Returns", *CFA Institute Conference Proceedings*, CFA Institute, pp. 39-51.

AXA Australia Website, "It's about time in, not timing the market", downloaded 25/7/2010.
Browne, C., (2007), *The Little Book of Value Investing*, Wiley.

Fama, E., (1965), "The Behaviour of Stock Market Prices", *Journal of Business*, 38, pp.34-105.

Faff, D., Gallagher, D.R., and Wu, E., (2005), "Tactical Asset Allocation: Australian Evidence", *Australian Journal of Management*, Vol 30 No.2, pp.261-282.

Grinhold, R., (1989), "The Fundamental Law of Active Management", *Journal of Portfolio Management,* pp.30-37.

Haugen, R., (1999), *Beast on Wall Street: How Stock Volatility Devours Our Wealth*, Prentice Hall.

Ibbotson, R.G. and Kaplan, P.D., 2000, "Does Asset Allocation Explain 40, 90 or 100 Percent of Performance?", Association for Investment Management and Research, *Financial Analysts Journal*, pp.26-33.

Jansen, D., and de Vries, C., (1991), "On the frequency of large Stock Returns: Putting Booms and Busts into Perspective", *Review of Economics and Statistics*, 73, pp.18-24.

Longin, F., (2005), "the Choice of Distribution of Asset Returns: How Extreme Value Theory can Help?", *Journal of Banking and Finance*, 29, pp.1017-1035.

Mandelbrot, B., (1963), "The Variation of Certain Speculative Prices", *Journal of Business*, 36, pp.394-419.

Mandelbrot, B., and Hudson, R., (2004), *The (Mis)Behaviour of Markets: A Fractal View of Risk, Ruin and Reward*, Profile Books.

Mauboussin, M., (2006), More than Your Know: Finding Financial Wisdom in Unconventional Places, Columbia University Press.

MLC Investments, "How to invest sensibly...It's time in, not timing the market that matters", downloaded MLC website 25/7/2010.

Oliver, S., (2010), "Asset Allocation isn't everything, but it nearly is", *Oliver's Insights*, 19, pp.1-2.

Rumble, T., (2009), "Why does Capital Protection Have to be so Hard?", www. alpha-invest.com.au/research—education/articles, downloaded 5/07/10.

Taleb, N., (2007), *The Black Swan: The Impact of the Highly Improbable*, Random House.

Zurich Investments, "Time in versus timing – build your wealth by investing now", downloaded from Zurich website 25/7/2010.