portfolio construction forum

Implementing an absolute risk & return approach to portfolio construction

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This paper discusses the risk management requirements in an absolute return focused investment framework and the measures investors can take to improve their risk management practices.

The paper begins by discussing the importance of absolute return objectives and the implications for risk management if these objectives are to be genuinely pursued. Many risk management techniques remain relevant, such as diversification, but their application and focus need to change. This is discussed with particular attention given to the management of tail risks. A section of the paper specifically addresses portfolio construction as this process is entwined with a number of risk management considerations. The paper concludes with some guidance relating to risk monitoring and a step by step guide to implementing an Absolute Return approach.

The comments and recommendations in the paper relate to portfolio construction practitioners including financial advisers, their client portfolios and the underlying managers and strategies employed.

How to manage specific risk issues relating to absolute return is the focus of this paper, although it also touches on broader conceptual and practical issues as the recommendations develop. A true absolute return focused investment approach is far different to the old asset class based, set and forget, relative return, single scenario, portfolio management strategy. This is an approach which seeks to achieve a more complex but more relevant outcome.

1. OBJECTIVES

The first and most basic principle in the shift to Absolute Return investing is to adopt absolute return objectives for the overall portfolio. An absolute return outcome is not going to be achieved solely through adding absolute return strategies or alternative asset classes to a traditionally constructed portfolio.

1.1. Investor objectives

The focus of much debate and literature relates to the merits or otherwise of absolute return objectives rather than relative. For example seeking to achieve an objective of cash plus 5% over a defined period rather than seeking to outperform an equity based index, or combination of asset class indexes, over a set year period.

Investor objectives should be realistic and focused on their own needs and requirements. This requires a development in the sophistication of many investors but is reflected in the growth of Self-Managed Super Fund's. There are clearly a number of reasons for this phenomenon but some must be the demand from investors for solutions that they understand, have control over and believe meet their particular needs.

Gauging the needs of an investor base from an advisors perspective requires a high degree of engagement with the client. Others have made the point that the "industrialisation" of investing has depersonalised relationships between investors and their asset managers[1]. To achieve Absolute Returns, an element of flexibility in the investment strategy is required, and to achieve this requires a higher level of engagement than has become the norm. Advisors should understand their clients' circumstances and requirements, manage their expectations, and develop a framework where they can operate more opportunistically to take advantage of opportunities and to actively manage their clients' risk of not meeting his or her objectives.

It's worth noting that many traditional balanced multi asset portfolios have absolute or real return targets. The underlying components however, equities, bonds etc. were (or still are) measured against asset class index benchmarks. It was a matter of faith (or actuarial skill?) that the relative return focused components would combine to generate an absolute return result. This was the role of the asset allocator, whose job was to predict the expected returns of a handful of asset classes in order to achieve the overall objectives. As has been demonstrated over time, the forecasting of asset class returns over anything but the very long term is a hazardous business. Such an unreliable activity should not be placed at the heart of the investment process.

1.2. Absolute and relative risk

Having an Absolute Return benchmark focuses the investor on absolute risk – the risk of losing money. These risks in turn re-orientate the investment strategy: in building a portfolio we are no longer concerned with positions relative to an index, but in the absolute size of those positions – the relevant gauge of risk has changed.

High absolute volatility and the occurrence of significant losses can severely impede the accumulation of capital. Figure 1 shows an example of four different investments with the same simple average return but with different volatilities. The lower the volatility, the higher the compound returns.

Figure 1: Examples of the effect of volatility on the power of compounding

	Investment A (%)	Investment B (%)	Investment C (%)	Investment D (%)
Year 1 return	10.0	13.0	19.0	25.0
Year 2 return	7.0	9.0	13.0	17.0
Year 3 return	3.0	1.0	-3.0	-7.0
Year 4 return	-4.0	-7.0	-13.0	-19.0
Volatility (Std Dev %pa)	5.2	7.7	12.7	17.7
Simple average return (%pa)	4.0	4.0	4.0	4.0
Compound return (%pa)	5.2	5.0	4.3	3.3

Source: Pengana Capital

This simple example illustrates the negative impact of high volatility on compound returns. It is particularly dangerous for those approaching or in retirement.

Older investors cannot withstand a significant equity market correction near or during retirement. Figure 2 below shows the time to recover from a bear market downturn depending on different subsequent rates of return. In a low return environment, for example 6% per annum, it will take 6 years to make back a 30% market decline.

Figure 2: Older investors cannot take the risk of a bear market

Rate of Return	Size of Bear Market Downturn				
	-10%	-20%	-30%	-40%	-50%
2%	5.25 years	11.25 years	17.75 years	25.50 years	34.75 years
4%	2.75 years	5.50 years	9.00 years	12.75 years	17.25 years
6%	1.75 years	3.75 years	6.00 years	8.50 years	11.50 years
8%	1.25 years	2.75 years	4.50 years	6.50 years	8.75 years
10%	1.00 years	2.25 years	3.50 years	5.25 years	7.00 years

Source: Pengana Capital

As Jim Rogers put it:

> "The trick in investing is not to lose money. That's the most important thing. If you compound your money at 9% a year, you're better off than investors whose results jump up and down, who have some great years and horrible loses in others. The losses will kill you. They ruin compounding rates and compounding is the magic of investing."[2]

Focusing more on the risk of loss brings into consideration "drawdown", a frequently referred to risk measure when assessing the magnitude of losses and the time taken to recover from them. Drawdown measures peak to trough losses, so the maximum drawdown experienced by a fund or strategy illustrates the maximum amount historically that has been lost. The circumstances under which this occurred are clearly informative. A related piece of information is the time it takes the strategy to make back losses suffered (the "time to recovery"), and underwater analysis which shows the amount of time spent in drawdown.

Further exploration of the nature of losses introduces severe loss measures, such as Conditional Value at Risk (CVaR). CVaR seeks to estimate the likely magnitude of a loss, if a severe loss was to occur. This is more informative than VaR which just provides the likelihood of a severe loss, but does not then give an indication of how severe it might be. Risk measures are discussed in more detail in the Risk Monitoring section.

Having an absolute return benchmark also brings into focus the risk of performing poorly in an absolute sense for a period of time. Falling 10% while a benchmark index falls 15% is no longer considered a satisfactory outcome. Similarly, generating no performance over an extended period when the market falls or goes sideways is no longer considered a

satisfactory outcome. Such fundamental differences between relative return and absolute return investing clearly demonstrate that changes are required to portfolio construction and risk management if absolute return objectives are to be met.

2. RISK MANAGEMENT

It is important to distinguish between risk and uncertainty. Risk has assessable probabilities and impact, uncertainty by definition is unknown. Statistics and risk models can help with the former, not the latter. The latter requires organisational development – as discussed in greater detail below.

A comprehension of what risk management should be is essential. It is not a list of numbers and rules. It is an understanding of what might happen, why it might happen, and what to do when it does happen. It is also preparedness for the unknown and how to respond to the unexpected. "Importantly, investors should regard risk management as a guide for quality decision making in the face of uncertainty and not simply view it as being about risk measurement or generating an all-inclusive set of risk numbers."[3]

Many recent articles and papers relating to risk comment on the complex and adaptive nature of markets, that they are reflexive, innovative and unstable.[4] Any quantitative model or process, however complicated it may be, will not be complex enough to model, predict or manage risks that investors may face. For this reason, the more "views" on risk that can be developed the better.

The more tools in the toolbox, the more measures to monitor the risks faced, and hopefully indicate when risk may be increasing or diminishing, the better.

Interesting observations on risk management can be drawn from many walks of life. A good example is avalanche risk, which is discussed in depth in 'A Practical Guide to Risk Management'.[5] Avalanches are a known risk, they are anticipated but their timing and severity is unpredictable, and therefore similar to investment market risks. They are typically managed in the following way:

- Learn about avalanches in general – study prior events to understand likely conditions;
- Learn about specific conditions at the time; and,
- Create damage control strategies

Interestingly Tremper[6] notes that group dynamics and decision making are often the most important influence on the impact of an avalanche.

> "They either didn't notice the problem, or more commonly they over estimated their ability to deal with it… smart people regularly do stupid things."

Asset managers should be aware of more effective investment strategies. New techniques have been developed in the areas of risk budgeting, risk parity, assessment and sophisticated techniques and products are becoming more broadly adopted to manage specific risks. The following sections cover some old and new strategies for managing risk. All can be incorporated into a comprehensive risk management framework that approaches and manages risk from a number of different perspectives. It is better to employ all these techniques wisely than to focus on one. This will result in no risk being taken based on that particular measure or gauge, but significant other risk being taken that the investor may be unaware of.

2.1. Diversification

> "The Financial Crisis revealed devastating weaknesses in our financial systems, and it highlighted severe deficiencies in the way we measure and manage risk. In my view, however, the crisis did nothing to undermine the central tenets of successful investing. The best way to control risk is to diversify, but we need to do it more intelligently."[7]

Diversification has been an important tenet of successful risk management over many investment cycles and through many investment paradigms. It remains so today. To do so effectively though, as demonstrated by experience in the Financial Crisis, a deeper understanding of an asset's characteristics and behaviour in extreme market conditions is required. For example:

- Consider turbulent periods and calm periods separately. In particular consider the correlations between assets during periods where losses are likely to occur. It would however be incorrect to study only turbulent periods, unless the objective of the portfolio was specifically to protect against such events.
- Focus on the underlying risk factors: what is driving the returns? Is it the same or different to other investments? What are the other coincident risks? For example are any of the funds using the same counterparties? Are the funds subject to liquidity issues or margin calls from their brokers in particular environments? Are the strategies naturally long or short volatility i.e. if volatility spikes upwards, what is the likely impact on the strategy? Such issues are considered further in the stress testing and factor risks sections of this paper.

It's also worth noting that low correlation characteristics in themselves are insufficient to warrant portfolio inclusion. Many fund of hedge fund portfolios have performed

disappointingly over the years. While doing a good job of reducing the risks, due to the low correlation of the underlying strategies, their performance has been poor because those strategies have just not performed. It is important to have confidence in the return potential of a strategy as a prerequisite to considering its risk characteristics and its portfolio complementarity.

2.2. Leverage, liquidity and counterparty risks

Leverage is a tool that can be used to an investor's advantage, but clearly poses risks that must be managed. Leverage requires liquidity, and when liquidity dries up, for example during a financial shock or a period of reduced risk appetite, and investors seek to liquidate assets, being highly levered or invested in assets that cannot be readily sold can lead to significant losses. As liquidity to investors is typically provided through profit taking organisations, it is often withdrawn at precisely the wrong time, leading to a cascading effect.

However, the optimal level of leverage in the financial system is not zero. The banking system is based on leverage, and works well unless everyone wants their money at the same time. Leverage is an important element of a successful capitalist system.

Liquidity is an issue that arises at both a fund management and an overall portfolio level. Fund managers should manage the liquidity in their strategy to ensure they are able to meet fund liquidity requirements, and advisors should consider the overall liquidity of their portfolios to ensure they can meet clients' liquidity requirements.

Liquidity is a determinant of the availability of leverage and a factor in considering the appropriate level of leverage to employ by fund managers. Inappropriate levels of leverage are a common component of financial crises and unfortunately many investors and advisors have therefore determined not to invest with managers that employ leverage. However we believe careful management and use of leverage by an experienced manager who can clearly demonstrate the purpose of such leverage should not be avoided.

From a fund management perspective, leverage should be utilised but limited, using prudent limits depending on the underlying assets that are being invested in. Prime brokers will generally provide generous leverage terms, allowing investors to lever their asset base many times. But bear in mind that if the environment deteriorates, for example during the Financial Crisis, margin requirements may be increased dramatically which may force the sale of assets to reduce leverage, and inevitably this occurs when many others are seeking to sell the same assets. Hence the cascading effect on prices. Funding liquidity risk should be understood and discussed with underlying managers that have prime broking relationships.

At a portfolio level, advisors should assess what proportion of their assets may be illiquid. For example gauging the likely liquidity requirements of their clients and investors, and ensuring these may be met during a period of adverse liquidity conditions.

It is also worthwhile considering here the risks that relate to counterparties, typically the custodians and prime brokers of investment managers. This area is little understood by investors and terms such as "rehypothecation" have only become widely known since the Lehmans collapse and the Financial Crisis. It is important to ask underlying managers what counterparty risks they face. For example, is the cash held by their custodian commingled? What proportion of their assets held with their prime broker may be rehypothecated? Ultimately the questions that need to be answered are: how much could the fund lose in the event of the insolvency of the counterparty, and how likely is the counterparty's insolvency?

2.3. The human element – risk mitigating behaviour

At the core of funds management is making decisions with imperfect information and in uncertain circumstances. However, quant analysis of risk does have value because human intuition is a poor assessor of probability and uncertainty. For example: the probability of two people in a room of 20 having the same birthday is 44%. Most would perceive the likelihood to be much lower.

There is a benefit to organising and systematising problems, and asking "what if we're wrong". But quant tools are not a substitute for informed judgement. The problem with judgement is that it is subject to well documented behavioural biases. Human beings are not rational investors. They are fallible, impatient, overrate their abilities, and are subject to bouts of greed and fear.

There are four principle human characteristics identified in the behavioural finance literature that can lead to investment and risk management mistakes:

1. Familiarity (not recognising risks)

2. Commitment (not recognising new information)

3. Herding instinct (pressure not to be left behind)

4. Belief inertia (not changing views quickly enough)

Over confidence is also a difficult issue with respect to risk management – confidence is necessary for success but overconfidence can lead to disaster. Events are often random, or far more likely/unlikely than we think, (i.e. there is a significant element of luck), but due to our desire for control we believe events reflect skill or lack of skill.

Factored together it is clear how human emotions affect markets and decision making. Investors must be aware of their fallibility, particularly in the face of unprecedented, unexpected and grave situations. The best counter to these issues is the development of sound organisational risk management practices, and this is considered in the next section.

2.4. Organisational risk management

It requires organisational development to manage, respond appropriately and overcome adverse risk events. A risk conscious culture within an organisation is a powerful tool in perceiving potential risks and coordinating an appropriate response. Governance policies and procedures, while unglamorous, are essential to ensuring that impromptu decisions are made with the right principles and values in mind. Without such guidance, employees may not know how to act or what the correct course of action should be, and therefore act inappropriately.

Importantly, the organisation must be clear what risks it is prepared to take and what risks it is particularly vulnerable to. Responsibility for different risks must be clearly articulated so there is no doubt as to who must act in a given situation. Time should also be spent thinking creatively about the risks the organisation might face and how to react in the event that they occur. Compensation schemes should not just reflect profit, they also need to encourage risk awareness.

2.5. How to manage tail risk

Tail risk, strictly speaking an observation in the tail of a probability distribution but in layman's terms an unexpected loss of large proportions, occurs at two levels. Firstly at an individual investment or strategy level, so for example an investment manager experiences a significant loss related to a position or positions held in the portfolio. Secondly, at a portfolio level, which is typically related to an asset bubble bursting or some other form of systemic risk that affects macro-economic variables and markets more broadly, and can have a significant impact across an investor's portfolio.

As the intended audience of this paper is investment advisors not fund managers we'll focus on the latter, which are typically precipitated by common factors:[8]

- Financial innovation (product or strategies are rarely tested for their potential adverse impacts prior to commercial implementation)
- The emotions and psychology of investors (particularly a belief that prior success will continue into the future)
- And speculative leverage (that can result in a risk aversion storm if risk appetite changes)

2.5.1. Assessing tail risks

Tail risks are also referred to as "fat tails", which relates to the nonnormality of most return distributions, and the greater likelihood of observations occurring in the tails of the distribution. Despite their nonnormality return distributions may still be statistically analysed:

- Use of an alternative distribution with fatter tails e.g. students t-distribution
- Extreme value theory, which specifically models the extremes using a generalised extreme value distribution.

However a pragmatic approach and one available to all investors is to use conservative rules of thumb. For example, Litterman (1996)[9] discusses rules of thumb adopted by Goldman Sachs where they assumed a four standard deviation event happened on average once a year. According to the normal distribution, only a 2.6 standard deviation event happens once a year. Using a conservative assumption to overlay any decision process that relies on the normality of market behaviour will help investors from falling into the trap of not recognising the higher frequency of large negative or positive observations, and establish realistic expectations.

2.5.2. Three approaches to managing tail risk

Many papers have been written on the need to adapt market mechanisms, refocus regulatory efforts, and solve the "too big to fail" moral hazard issue, but the aim of this paper is to provide advice to practitioners about how to protect portfolios. The author believes there are three options, none of which are particularly appealing:

- Permanent risk reduction – Permanently reducing the portfolios risk level, for example by holding higher strategic cash deposits is effective but will also permanently reduce the portfolio's long term return. This may be acceptable to some investors but is unlikely to provide a broad solution.
- Market timing – Market timing is notoriously difficult from investment and agency perspectives. When risk premiums are low, it is likely that risks are high, so successful market timing necessitates a contrarian view, and an ability to implement a strategy in the face of conventional wisdom at the time. Since the financial crisis, new techniques have been developed to help identify environments of high systemic risk, and these are discussed in the final section of this paper.
- Hedging and insurance – Insuring the portfolio through hedging techniques is an attractive proposition but in practice can be expensive. Implementation of a long volatility strategy, i.e. buying volatility through VIX futures or other volatility products, has appeal but can be an expensive strategy if not implemented well.

A prudent and successful approach would be to employ a measured amount of all three options – that is, not to permanently reduce risk to the point where there is no opportunity for return, but base the risk budget on realistic expectations of assets' risk and return characteristics. Don't swamp all other decisions with heroic market timing calls, but make sensible decisions to lighten up on expensive assets or to reduce allocations if bubble characteristics become apparent. Don't pay away all your return in hedging premiums, but take advantage of attractive pricing opportunities, when volatility is low for example, and focus on insuring the most significant risks.

Taking these measures should mitigate some but not all of the tail risk, and place investors ahead of their peers who have not taken any steps to control risk, or are relying exclusively on a single method.

2.5.3. Anticipation of tail risks: new tools

Unsurprisingly, a product of the financial crisis was a body of work seeking means of anticipating, and therefore avoiding, such events. Unfortunately, this is a tough task, given their unexpected nature and their variation from one event to another. They have similar characteristics but they are never the same. If they could be identified, they probably wouldn't happen.

However, there is some merit in measures that seek to identify environments in which systemic risks may be high. This is a bit like predicting the weather and arguably no more reliable. It may however help us to identify those times when it's worth doing the equivalent of carrying an umbrella, even if we don't need to use it.

An example of such a measure is the absorption ratio.[10] When the ratio is low the market is well diversified, being driven by many factors, and resilient to shocks. When it is high it is not well diversified, focused on only a few factors, and exposed to shocks. So, for example, when the ratio is low, a fall in the gold price may only affect those investments directly impacted by the price of gold. However, in a poorly diversified or "tight" market a fall in the gold price may have a more systemic effect leading to falls in a broader group of asset prices.

Using such a measure can indicate when the market is vulnerable. It still requires a negative shock however to precipitate a market fall. A combination of indicators is therefore required but, consistent with much of the advice in this paper, it is foolish to rely on such techniques too precisely or to build a risk management process finely tuned to the results of one such piece of analysis.

Better to use this as another moderator to the risks taken. When systemic risks appear high, take some risk off the table in the areas which appear most vulnerable. This coupled with the other measures advocated in this paper will stack the deck further in the investors' favour.

3. PORTFOLIO CONSTRUCTION

The traditional means of constructing portfolios can be summarised as follows – set objectives (typically relative to CPI or cash), derive long term asset class risk, return and correlation assumptions, use an optimisation approach to develop an efficient frontier of portfolios, select portfolios on or near the frontier most likely to meet the objectives, select managers to manage the asset class buckets, monitor and rebalance as required.

This is a sensible approach but it has been mishandled and reshaped over the years to the point where the resulting portfolios, the managers selected and the means by which they are monitored has departed from the original objective. To develop a true absolute return portfolio, that is robust in different market environments and takes advantage of the options available to contemporary investors, it should incorporate the following developments:

1. Objectives – should be absolute return in nature and incorporate risk. For example a volatility target or limit, or a drawdown limit or drawdown recovery objective. The objectives should be relevant to the client base and not generic.

2. Asset classes – rather than constraining the allocation to traditional asset classes, a broader range of asset classes and strategies should be considered from the outset. This is in contrast to the common approach at present of using a traditional portfolio construction approach, and then trying to squeeze alternatives in at a later date. The question "do I allocate to alternatives from my bond or equity portfolio?" should not need to be asked.

   Note that this is different from the core/satellite approach. In the conventional core/satellite approach, assets are determined to be core or satellite before the analysis starts. It is not clear why some assets are determined to be "core" and some "satellite" at such an early stage. A better approach is to treat all opportunities the same and then factor in expense or accessibility at a later stage.

   Only through this means can an investor ascertain what an optimal portfolio is. Only the investments that are consistently well represented in the portfolio analysis process, and fare well in the risk analysis described below, should be considered "core". Investments that are volatile, exhibit high drawdowns and have high correlations with well observed risk factors should not be rewarded core portfolio allocations.

3. Modelling – optimisation may be used to gain a broad understanding of efficient options, the portfolio characteristics of different investments, and the changes in the allocations across the frontier. The frontier is a set of "efficient" portfolios, i.e. for a given level of risk the return is maximised. The portfolio selected depends on the risk tolerance or objective.

4. Incorporating non-traditional investments at this stage greatly improves portfolio efficiency – as discussed above in the section on diversification, portfolios should be analysed from a factor risk perspective to ensure they are robust, and the optimisation analysis should be conducted and compared over different time periods. Stress testing and / or scenario analysis of the resulting portfolios should also be performed.

5. Manager selection – managers should be selected to specifically meet the objectives and the requirements of each portfolio component. The use of cheap beta sources for traditional asset classes should be considered. Active managers should be selected who demonstrate similar characteristics to the overall portfolio objectives: absolute return focused, properly diversified, with strong downside risk management.

6. Monitoring – active monitoring of managers and portfolios, principally from a risk perspective. The objective is not to achieve a set and forget strategy but to regularly monitor the valuations of the underlying asset classes and the progress of the underlying managers. Risk considerations should be clear and. Quarterly monitoring of asset classes and strategies should suffice with a readiness to re-evaluate quickly if an event occurs. Whatever the process and parameters that are decided upon, the main objective is to establish an institutional framework that is disciplined yet flexible enough to act in the light of new information. The principal portfolio construction requirements are considered in more detail in the remainder of this section.

3.1. Optimisation

Markowitz was well aware of the unreliability of expected return estimates and the susceptibility of the optimisation process to them. He wrote "... we must have procedures for finding reasonable [estimates of expected return and volatility]. These procedures, I believe, should combine statistical techniques and the judgement of practical men. My feeling is that the statistical computations should be used to arrive at a tentative set of [return and volatility]. Judgment should then be used in increasing or decreasing some of these inputs on the basis of factors or nuances not taken into account by the formal computations."

For these reasons, a number of practical measures should be taken in any optimisation process:

1. Limit the allocation to any one investment. Follow simple principles of diversification to reduce the over reliance on any one asset or manager

2. Consider the change in the portfolios across the frontier, from the least risky portfolio to the highest performing portfolio.

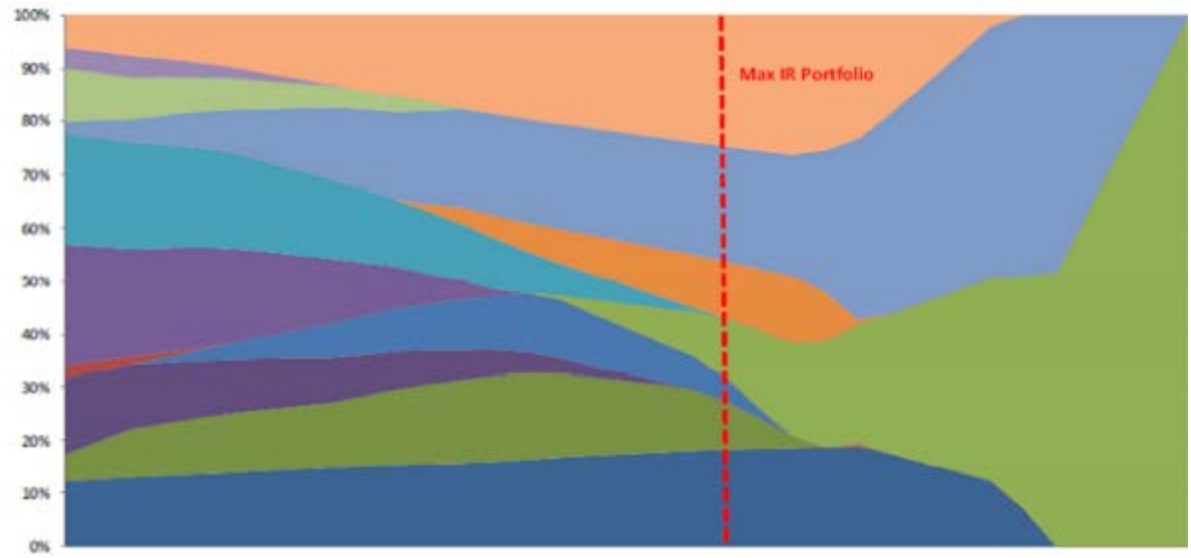
3. The optimisation process should be run over multiple periods, again to assess the impact of changing the inputs to the model. This is particularly true if using historically based return expectations, but volatility and correlation may also change

over time. Comparing the results of rolling three-year optimisations within a five-year period is far more instructive than considering a single five-year optimisation.

The relative stability of the risk assumptions relative to the return assumptions, means that portfolios to the left of the frontier, the lower risk portfolios, tend to be more stable and reliable than the portfolios to the right of the frontier, the higher risk portfolios. The allocations in the low risk portfolios do not change as much depending on the period of analysis, whereas the higher returning portfolios become increasingly unstable until, at the extreme, the optimiser (if unconstrained) will allocate 100% to the highest returning asset over the period of analysis. If you can foresee which of the assets within the pool will be the highest performing over the analysis period with a high degree of confidence we suggest you stop reading this paper.

Figure 3 shows the results of a single optimisation. The least risky result is shown at the extreme left and most risky at the extreme right. The portfolio with the maximum information ratio is shown by the red dotted line. If this optimisation was run over a different time period, with the same underlying managers, the portfolios to the left of the graph typically would not change significantly – the risk characteristics of the managers are relatively stable. However, the portfolios to the right may change completely, depending on which were the strongest performing managers over the period in question.

Figure 3: Single period optimisation, asset allocation of efficient portfolios

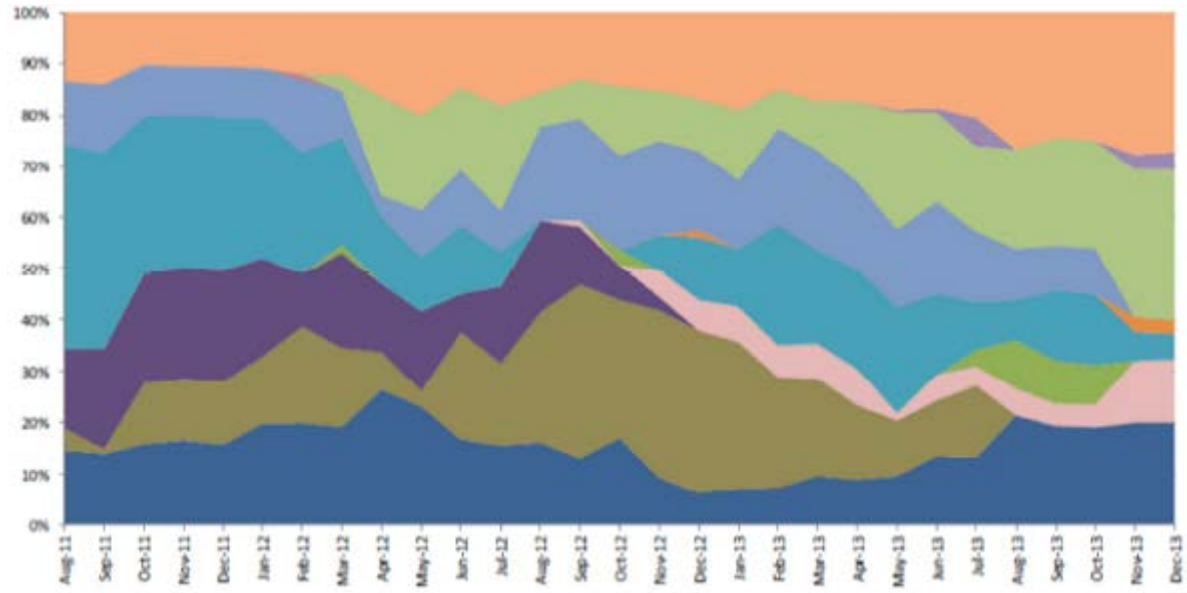


Source: Pengana Capital

Figure 4 shows the asset allocation results from an optimisation process that has been run on rolling three-year periods. It shows how the optimal allocations to different managers varies over time. Some of the managers, for example, the one represented by the blue area at

the bottom of the graph, receive a consistent allocation. Others, such as the purple or green managers may be more dependent on a particular environment to contribute to the portfolio. This suggests a tactical allocation may be more appropriate.

Figure 4: Multi period optimisation, asset allocation of maximum IR portfolios



Source: Pengana Capital

As mentioned above, the use of non-traditional asset classes and strategies will greatly improve the portfolio efficiency i.e. the expected return for a designated level of risk. Such investments typically offer increased diversification through lower correlations, higher risk premiums and the potential for higher returns, and a greater focus on alpha to generate returns.

It may help to group investments depending on characteristics salient to the investment approach and concepts being used in the formulation and principles behind the portfolio construction process. For example, the concept of core and satellite. Core investments have larger stable holdings while satellites are more tactical. "Core and explore" is a derivative of this, suggesting the tactical and far reaching nature of the non-core investments. Another method that has been suggested in a white paper by Goldman Sachs[11] is Purpose (return enhancing or risk mitigating) and Approach (broad or narrow). The purpose helps determine whether the allocation is funded from Equities or Bonds (if considering traditional alternatives) while the breadth helps determine the size of the allocation.

Ultimately however, while it is tempting to group investment managers in a convenient conceptual manner, they vary considerably with respect to strategy and outcome and they should be considered specifically with respect to their contribution to the portfolio, how they generate returns and the risks they introduce. This is discussed further in the section on

Absolute Return funds below.

3.2. Management of risk factors

At the heart of portfolio construction lies diversification. But as discussed above, this has to be true diversification i.e. assets that react differently to different inputs and are driven by different forces. They are fundamentally as well as statistically different. Portfolios that may look diversified may be driven by one or two risk factors, equity risk being the primary culprit. Asset class diversification has been exposed as insufficient to protect against severe market turmoil. Investors need to understand the underlying risk factors each of their investments is exposed to, and to build portfolios on this basis.

> "Many of the strategies that caused such pain and suffering in the global financial crisis had risks that were not the type of risk normally quantified in classical risk measures. I think portfolio managers would have made different decisions if they had considered the complexity, lack of transparency, difficulty in valuing, as well as other factors that are not easily quantifiable but are key components of what is risky and what is not."[12]

Sounds good but how do you do it? Clearly understanding an investment strategy and how it generates alpha is a good starting point. Studying the track record of the manager and similar managers and observing the conditions for strong and weak performance will also highlight the environments to which the strategy may be susceptible. Factor analysis using a risk model can also shed further light on what the factor exposures are. For example, equity factor models will typically include the following exposures:

Market	Interest rates	Growth	Value	Liquidity
Sector	Oil	Momentum	Size	
Region	Exchange rates	Volatility	Financial leverage	

3.3. Absolute return funds

Absolute return funds are essentially funds that have an absolute return target and use particular investment strategies and risk control processes to help ensure those objectives are met. First and foremost, they do not have objectives or risk limits that are expressed relative to a benchmark asset class index.

Absolute return funds include a multitude of different asset classes and investment strategies. They are sometimes interchangeably referred to as hedge funds but in practice

some hedge funds are not absolute return funds, for example a long short equity fund with a persistent long bias that seeks to outperform an equity index.

From firsthand experience managing absolute return strategies and hedge funds, the author believes the defining characteristic of a hedge fund is having the ability to lever and short, typically entailing a prime broking relationship to facilitate both activities. It is not related to the investment objectives, whereas the defining characteristic of an absolute return fund is its objective (assuming returns bear some resemblance to that objective).

Australian hedge funds, despite being widely criticised for all manner of sins, have performed particularly well. They have also done so in a highly regulated environment that demands transparency and, particularly in the retail market, liquidity. Opaque illiquid hedge funds do not get supported in Australia. It is ironic that many of the negative generic comments we hear from some investors about hedge funds cannot logically be applied to Australian hedge funds, however these same investors still choose to look offshore for their hedge fund exposure.

Clearly, employing funds that are seeking to achieve objectives that are similar to the investors' overall objectives is beneficial. How these managers manage their portfolios and the measures they take to control risk may also be instructive to the investor. Typically absolute return funds' returns are more consistent and less influenced by the market, they are more risk aware, more focused on capital loss, and in many cases – better investment managers. Often these managers have turned to an absolute return approach because that is how they would choose to manage their own money. Artificial requirements such as tracking error are of no interest or relevance to most experienced investors when they consider their, and other investors', real objectives.

Absolute return funds can also materially improve the efficiency of portfolios; by offering low correlation with traditional asset classes (and each other) while not sacrificing performance. The author's research suggests that a group of four to six absolute return funds is optimal given their typical risk and return characteristics. Introducing this wider set of alpha generation, low market correlation and more flexible investment strategies can improve a portfolios characteristics markedly: lower volatility, lower drawdowns, greater robustness through more diverse alpha sources and risk factors, and with comparable returns.

Practical difficulties do exist for the prospective investor considering an investment into Absolute Return funds, which has implications for the research and selection process. These are considered below:

- Complexity – Absolute return or hedge fund strategies may be more complex. For example the use of shorting, leverage, derivatives, different strategies, different means of analysing stocks, different asset classes, and different jurisdictions. The manager should be able to clearly describe and demonstrate the purpose and benefit of anything "out of the ordinary".

- Available research – Despite the obvious benefits of such funds, and the strong track records of domestic examples, third party research houses do not research many absolute return funds, and when they do their understanding and appreciation of the real issues (with some exceptions) is disappointing.
- Heterogeneity – As discussed, absolute return managers differ widely. Reviewing five different long short equity managers is not the same as reviewing five different long only equity managers. How they assess stocks, short and lever is likely to be very different, and as a result there will be a wider disparity in their returns.

For these reasons, the nature of the manager research and selection process (for an investor) should change as follows:

- Select managers that meet your objectives – If you are seeking to achieve 8% to 12% per annum with an annualised standard deviation under 10% and low correlation to equity market risk, then select managers that help to achieve these objectives. Managers that seek to achieve a similar risk return profile are a good place to start.
- There is no need to research every manager in the market – If you want a long only Australian equity manager, then you want to invest with the "best". It is a relatively homogenous group of managers and so, based on some consistent criteria, the "best" may be determined. However, given the heterogeneity of absolute return managers, it is more difficult to assess how to do this, let alone to then apply this process to a disparate group of strategies. To take a simple example, on the face of it Australian market neutral equity managers should be a similar group. However, their returns are very different and many show no correlation to each other. In practice, their definition of "market neutral" may not be the same, how they assess stocks and build portfolios also differs. They are not easy to compare.
- Get to know the manager – Understand what they're doing and understand their performance. Invest early, be a valued investor and get on the inside. If there are any issues then you will be one of the first to hear about them.

Not wasting too much time discerning between different "active" long only managers would also free up resources to be applied more usefully researching truly active managers that can make a tangible difference to the results. The range of returns generated by long only managers over a given time period tends to be limited and not significantly different from the index. Better to employ an ETF or similar passive alternative in long only asset class strategies and focus research efforts on those asset classes or strategies that cannot be easily replicated.

3.4. Derivatives and structuring

The popularity and use of structured products and derivatives has diminished in the wake of the troubles faced by CDOs and other products that failed to manage risk or protect investors against market falls.

Derivatives however can be used to adjust pay off profiles and provide returns in particular circumstances that may be preferable to investors when compared with the linear return pay off from a long only investment. Derivatives can be used to constrain returns above or below certain limits, enhance returns, hedge returns and so on. They can be of particular use in an absolute return sense to reduce downside risk, perhaps at the expense of some upside participation. Such a trade-off would be valuable to many investors seeking to constrain potential outcomes, or trying to remove some of the volatility from market gyrations as they near a particular landmark such as retirement.

In addition, products can be structured around interesting themes, and ideally the theme would lend itself to favourable option pricing to enhance the appeal of the product. For example, low volatility investing has proved a successful approach in itself, and has the added attraction of the availability of cheap options due the low volatility and high liquidity of the underlying assets.

The outperformance of low volatility equity portfolios has been confirmed in numerous studies and is found to persist in most markets. For example, a study by Baker, Bradley and Wurgler[13] took 41 years of data on the 1,000 largest US stocks from 1968 until 2008. The stocks were sorted into five portfolios each month according to trailing volatility. The results showed that:

- One dollar invested in the lowest volatility portfolio in January 1968 was worth $59.55 in December 2008; and,
- One dollar invested in the highest volatility portfolio over the same period was worth only $0.58.

It is possible to structure a product over such an index that gives a high degree of participation on the upside while protecting on the downside – an enhanced payoff profile suitable for many investors who are concerned with absolute returns. Derivatives and structured products should therefore not be discounted. Common sense applies – understand the product, get to know the manager, and in particular assess the circumstances in which the product may fail to deliver on its objectives.

3.5. Stress testing

The stress testing of portfolios is strongly recommended. Stress testing is the process whereby the portfolio's performance under certain "stressed" conditions is analysed – for

example a significant fall in equity markets or rise in interest rates. To be able to perform the analysis, position level information is required and a risk model that can map the impact of a change in the variable on security values. Stress testing can be performed using:

- General market scenarios, as discussed above;
- Historical scenarios, such as the recent financial crisis; and/or,
- Portfolio specific scenarios, such as a significant loss in a large position and the wider impact this may have.

While most practitioners may not have direct access to a risk model to perform the analysis themselves, there are now third party risk consultants that provide this service.

Arguably, however, the future is never the same as the past. Stress testing based on historic analysis may therefore be criticised as of limited benefit. The analysis remains informative, however this view does highlight the need to focus on how to respond to an unexpected and unspecific extreme event, as discussed in the section on organisational risk management above.

3.6. Risk budgeting

The risk budgeting approach targets a level of risk across the portfolio and then allocates this specifically in budgets to different components with in the portfolio. The allocations may be determined on a volatility basis for example, within which each component makes an equal contribution to the overall expected portfolio volatility. The risk exposures are kept constant and the portfolio weights vary over time. Such an approach can be effective as it is explicitly focused on risk, rather than return, and it provides a disciplined framework around which allocations are made.

It is important to keep in mind the same issues that relate to the use of historic data, and the analysis of it, on which to base forward looking decisions. Any statistical method is subject to the assumptions and therefore the time period over which it is assessed. Using short and long term historical windows is a useful technique, especially given the high frequency of market corrections and recent financial market experience.

3.7. Dynamic asset allocation

Dynamic asset allocation, or DAA, is a (relatively) newly coined term to describe the dynamic allocation of portfolio weights to different asset classes or investments. It is referred to as dynamic in contrast to a strategic allocation which seeks to identify a long-term fixed allocation around which the assets are managed, either actively (typically with tight ranges) or passively rebalanced.

Investors need to be careful that DAA isn't old school asset allocation under a different guise. It is necessary to have a variety of asset class and strategy options and to use a disciplined and predetermined approach. To be consistently successful in a decision-making process, assuming a degree of skill, the decision maker must have a number of decisions to make, not just one (equities vs bonds), or maybe two (equities vs bonds vs cash). A truly dynamic portfolio may have 10 to 20 underlying asset classes or strategies, ranging from conventional equities, to market neutral, to foreign exchange, to real assets, to volatility, etc. These assets will have core allocations and ranges, and the full width of those ranges would be expected to be used over the course of an investment cycle.

The allocations should be driven principally by valuation relative to long term expectations taking into account shorter term influences. In an advice context, they should also be determined by the age and needs of the investor to ensure that their particular risk profile and objectives are met. This therefore requires an understanding of the relative opportunities represented by each investment, the time frame over which the opportunity is likely to be realised, and the needs of the end investor.

An alternative is to manage the allocations on a risk-driven basis. For example, the investor may seek a constant level of volatility, and manage the underlying allocations on this basis, regularly monitoring the volatility and correlations of the underlying allocations. A further development to this approach would be the use of risk triggers to identify periods when the target volatility should be managed up or down, generally driven by observations of the overall macro environment that affects the underlying investments.

4. RISK MONITORING

Risk monitoring may be differentiated from other elements of the risk management process in that it occurs post, rather than pre, investment decisions being made. It should operate at the individual investment level and the portfolio level and incorporate risk limits established in advance, and the monitoring of more subjective factors such as operational or corporate developments that may impact the strategy.

4.1. Transparency

Transparency is the key ingredient in monitoring risks. Ideally underlying managers will share their portfolios with investors and talk through the current positioning, explaining the nature of positions and how they view the individual and aggregate risks in the portfolio, and the steps being taken to monitor them. Investors should have a clear understanding of the strategy so that they can identify anything unusual that may suggest the manager has deviated from the mandate, has a problem position they do not wish to discuss or is simply lacking ideas or opportunities.

4.2. Risk measures

There are a wide variety of statistical risk measures, with varying purposes and applications. The following table illustrates the measures we use and recommend, summarised by type, with some more detailed descriptions of the key measures included below.

Exposure	Volatility	Risk of Loss	Correlation	Factor Analysis
Net and gross exposure	Standard deviation	Max drawdown	Correlation – rolling 3 year and since inception	Systematic and specific risk
Max / min position sizes	Histogram of monthly returns	Drawdown recovery period	Beta – rolling 3 year and since inception	Factor exposures
Concentration of major positions	% positive / negative monthly returns	VaR and CVaR	Periodic analysis e.g. in bear / bull markets	Stress testing

Net and gross exposures: the net and gross exposures of an investment strategy should be understood with respect to their expected average, minimum and maximum. Any variation and the reasons for it should be identified and considered by the investor.

- **Volatility** – most strategies will have a target or expected volatility range. This should be monitored and any meaningful deviations discussed with the underlying manager. It may be that they are varying the risk in the portfolio and the reasons for it should be explained to the investor.
- **Drawdown** – a good understanding of a strategy yields an appreciation of the likely drawdown, enabling the investor to identify unusually large losses. These should be immediately addressed with the manger as they probably bely a significant event within the fund's holdings or strategy.
- **Correlation** – should be monitored for any changes between the underlying investments, or between the investments and asset class indexes.
- **Value at risk** – VaR is very effective under normal conditions and should therefore form part of the monitoring tool kit. VaR provides a gauge of the likelihood of losses, but it does not provide any information about the expected size of the loss. It needs

to be supplemented with other tools, especially for analysing extreme market conditions.

- **Conditional VaR** – CVaR provides the mean value conditional on the loss exceeding a certain threshold. It supplements VaR by giving an indication of how big the loss may be should it occur. This is a helpful additional piece of information, particularly if it is beyond the means of the investor to employ more sophisticated techniques (such as modelling the distribution in the tail specifically).
- **Stress testing**: stress testing and scenario analysis were considered in the portfolio construction section above, but they should not just be performed during a portfolio construction exercise but maintained regularly to identify any changes that may indicate a shift in the underlying risks being taken across the portfolio. Failing the ability to aggregate positions across the portfolio, it remains a worthwhile exercise to ask the underlying managers to stress test their own portfolios. Similar vulnerabilities can then be identified in the underlying investments.

4.3. Factor risks

With absolute return strategies, the risks may differ markedly depending on the underlying strategy. The "factor " risks that the investor needs to consider are greater in number than with traditional strategies. This is advantageous from a return perspective, but more onerous from a risk management one. The following table provides a summary of the risks that should be focused on for generic hedge fund strategies. Clearly, an in depth understanding of the manager's process and how it makes money is the best guide as to the key risks for a particular manager.

Stategy	Risk								
	Market	Leverage	Liquidity	Event	Model	Credit	Regulatory	Volatility	Legal
Global macro	x	x	x						
Long short equity	x	x	x	x					
Market neutral equity		x	x	x	x				
Event driven			x	x			x	x	x
Fixed income arbitrage		x	x			x	x	x	
Convertible bond arbitrage			x	x		x		x	
Distressed			x	x			x		x
Short selling	x			x					
CTA	x	x			x				

5. STEP BY STEP GUIDE – ADOPTING AN ABSOLUTE RISK AND RETURN APPROACH TO PORTFOLIO CONSTRUCTION AND MANAGEMENT

1. Develop investment objectives, which should be absolute return in nature and incorporate risk. The objectives should be relevant to the client base and not generic.
2. Establish pool of investment options. Rather than constraining the allocation to traditional asset classes, a broader range of asset classes and strategies should be considered from the outset. Incorporate nontraditional investments at this early stage.
3. Construct portfolios. Base the analysis on realistic expectations of assets' risk and return characteristics. Optimisation methodology may be used to gain a broad understanding of efficient options and the portfolio characteristics of different investments. Portfolios should be analysed from a factor risk perspective to ensure they are robust, and the optimisation analysis should be conducted and compared over different time periods. Stress testing and / or scenario analysis of the resulting portfolios should also be performed.

   Only the investments that are consistently well represented in the portfolio analysis

process, and fare well in the risk analysis described, should have strategic allocations. Investments that are volatile, exhibit high drawdowns and have high correlations with well observed risk factors should be used on a tactical basis.

Consider liquidity requirements: assess what proportion of the assets may be illiquid given investor requirements.

4. Manager selection. Managers should be selected to specifically meet the objectives and the requirements of each portfolio component. The use of cheap beta sources for traditional asset classes should be considered. Active managers should be selected who demonstrate similar characteristics to the overall portfolio objectives: absolute return focused, properly diversified, with strong downside risk management.

   Focus on the underlying risk factors: what is driving the managers' returns? Study the track record of the manager and similar managers and observe the conditions for strong and weak performance. Factor analysis using a risk model can shed further light on what the factor exposures are.

5. Monitoring and ongoing management. Actively monitor managers and the valuations of the underlying asset classes. Risk considerations should be clear and the ability to dynamically change the portfolio in response to changing circumstances must be developed. Be prepared to make decisions to lighten up on expensive assets or to reduce allocations if bubble characteristics become apparent. Take advantage of attractive pricing opportunities, when volatility is low for example, and focus on insuring the most significant risks.

6. Organisation

   - Define policies, measurement methodologies and risk management roles and responsibilities

   - Study the likely broad investment risks: market risk, liquidity risk etc.

   - Establish predefined guidelines or decision rules, and in particular implement damage control strategies to reduce impact of sudden and unexpected events.

   - Develop culture of compliance and appropriate risk taking and ensure incentive systems mirror these objectives

CONCLUSION

From the discussion in this paper, it should be clear that the author does not believe there is a single approach that can be developed to assist investors seeking to adopt an Absolute

Return investment approach. However, there are principles that can be followed, priorities that need to be changed, and practices that need to be adopted that will facilitate this change and help achieve Absolute Return objectives.

The best outcome is the management of a multi-asset class, multi strategy portfolio by an objective portfolio construction practitioner who has a clear understanding of the needs of his or her clients and is able to reflect those needs in the portfolio decisions made. This, however, requires a degree of investment sophistication and client interaction which many portfolio construction practitioners would find hard to attain. A reskilling of the industry is required, and a re-engagement with the end investor. We need to change from short-term salesmanship to long-term stewardship.[14]

While these broader issues should be the main industry focus, risk management relates to many of them. This is particularly true in an absolute return framework and is a subject that constantly arises when practically seeking to develop and implement an absolute return investment solution.

ENDNOTES

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DISCLAIMER

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