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SRA - THE MISSING PIECE IN THE PUZZLE

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This paper argues that letting Strategic Asset Allocations dominate the return of portfolios severely restricts the flexibility of skilled portfolio managers to create diversified and optimal portfolios. Indeed, the restriction is so great that it is virtually impossible for active managers to add value after all fees are taken into account. The paper argues that active investors should not let their choice of the level of portfolio risk automatically determine the portfolio allocations, as is the case with Strategic Asset Allocation but rather that portfolio allocations should have regard for the risk and liquidity requirements of the investor but be flexible within wide but sensible boundary ranges.

This paper considers the key top-level portfolio construction decisions for active investors, covering:

- The choice of risk level and its associated expected return; and
- The investment policy that lays out the plan as how this is to be implemented.

For such top-level portfolio construction decisions, in the beginning there was Markowitz. On the very first page of his seminal 1952 paper "Portfolio Selection", he wrote: "Diversification is both observed and sensible: a rule of behaviour which does not imply the superiority of diversification must be rejected both as a hypothesis and a maxim".

This paper argues that portfolio allocations should have regard for the risk and liquidity requirements of the investor but should be flexible within wide but sensible boundary ranges. It should be constructed on an opportunistic basis from the widest possible range and choices of investments and instruments, to allow the manager making the portfolio changes to play to its strengths and advantages, take advantage of one-off opportunities, and to position the portfolio in accordance with the prevailing valuation levels. This approach is called Strategic Risk Allocation.

Fixed investment buckets

The first step in the Strategic Asset Allocation approach is to choose from a standard list of asset classes. In Australia, this typically includes Australian equities, International equities, property, Australian fixed interest, international fixed interest, and cash. Typically, investors and providers of manager surveys identify risk by the split between growth assets (equities and property) and income assets (fixed interest and cash).

Problems arise when investments that do not fit the standard definitions of the traditional asset classes are used, such as extended asset classes and allocations to strategies. Extended asset classes include high yield bonds, inflation-linked securities, emerging market debt, securitised debt, and loans on the income side of the growth/income split, and emerging markets equities, small

capitalisation stocks, private equity, and infrastructure on the growth side. Extended asset classes typically have higher risk than the standard asset classes that are on the same side of the growth/income split. The problem is that a simple glance at the growth/income split does not communicate the extra risk in a portfolio that contains these extended asset classes versus a portfolio that does not contain any of these.

An investor allocates to strategies when the investment strategy involves attempting to outperform market index benchmarks. The resulting portfolio is almost always biased to a higher risk allocation than the underlying market exposure, because the stock-specific risk of active portfolios is higher than for indexed portfolios. In addition, where for example, an investor may implement an allocation to hedge funds in such a way that this sub-portfolio is uncorrelated with any market index, in which case its benchmark is the return of cash and thus rightfully sits on the income side of the growth/income split, its risk is much higher than that of a cash investment. Conversely, an investor may instead implement an allocation to hedge funds in such a way that the portfolio is highly correlated with market indices such as equities and high yield bonds, and so it rightfully sits on the growth side of the growth/income split. The problem for investors is that there is no way to distinguish between these two approaches to implementing allocations to hedge funds. The problem for providers of manager surveys is that hedge funds typically have higher correlations to equities than bonds so they do not fit on the income side of the growth/income split, yet their market beta to standard equities markets is significantly less than one, so hedge funds dilute the risk of the portfolio, if they are included on the growth side.

An unintended consequence of attempting to characterise all portfolios by asset classes and the growth/income split is that, once a portfolio has been labelled in this way, it is incumbent on a manager to ensure that the portfolio remains true to label. In particular, the manager tends to avoid taking on risk over and above what is shown on the label. This conflicts with the active manager's value proposition of aiming to outperform market benchmarks. Managers are constrained from investing in the extended asset classes, which arguably have a higher scope to outperform market benchmarks, and the scope for a manager to add value by outperforming through allocations to strategies is also inhibited.

Reflect for a moment on what the Strategic Asset Allocation approach is trying to do, which is to distinguish between levels of risk (and therefore, return) of different portfolios.

The approach should instead use a method of directly measuring the *total risk* of the portfolio, no matter how that portfolio is comprised. The point is that investors should be more concerned with how much damage a portfolio can do to their wealth, rather than what the portfolio is comprised of. In other words, a policy portfolio should describe the requirements in terms of *risk* rather than *assets*. That is the essence of the Strategic *Risk* Allocation approach, as opposed to the Strategic *Asset* Allocation approach.

Strategic allocations to the investment buckets

The next step in a Strategic Asset Allocation approach is to set the target amounts to be allocated to each of the buckets. In theory, the long-term optimal portfolio allocations should be used, but this is

difficult to quantify in advance. Over what time frame should the optimisation be performed over? Also, given that the optimal allocations under a mean-variance optimisation are sensitive to the input assumptions used, as noted by Chopra (1993), how can an investor be confident that the right allocation has been chosen? In reality, as Arnott (2003) points out when he defines maverick risk, the risk-return trade off becomes less about the investor than about the practitioner: "the greatest peril is the risk of being wrong and alone".

In the end, it is rational for the practitioner and the institution to set the allocations by reference to the allocation amounts of other portfolios identified as being in the same peer group. At least that ensures that the funds that are grouped together in peer group surveys in accordance with their growth/income split, end up with similar levels of total risk.

If product providers want their funds to be included in these surveys, then the products must be classifiable into one of the ranges of allocations to growth assets. Consider, for example, a product that aims to derive its returns from active strategies and is constructed to be equity market neutral and bond duration neutral. It has an allocation to growth assets of 0% *and* an effective fixed interest allocation of 0% but it doesn't sit comfortably in the lowest growth assets classification with products whose allocations are dominated by traditional bond and money markets. Instead, products such as these are consigned to the "too-hard-basket", if, indeed, such a classification exists. In other words, the funds that offer the greatest diversity of sources of returns are unclassifiable and thus are less likely to be offered and promoted as mainstream choices by product providers. Thus, the Strategic Asset Allocation approach leads to less diverse and sub-optimal investment products.

Tactical allocations to the investment buckets

The next step in a Strategic Asset Allocation approach is to vary the allocations to the asset classes to achieve higher returns than if the Strategic Asset Allocations had been followed exactly. In reality, investors employ this strategy, Tactical Asset Allocation, with varying degrees of commitment to the concept and, in many cases, disregard it entirely. This is mainly due to the perception and reality of maverick risk for the fiduciaries, businesses and managers involved in making these decisions. Employing Tactical Asset Allocation to any great extent involves lop-sided payoff scenarios. Getting Tactical Asset Allocation wrong involves crimped or terminated businesses and careers. Getting Tactical Asset Allocation right means you maintain your business and keep your job - the same outcome if it is avoided in the first place.

Consequently investments in asset classes are typically maintained in close proximity to the Strategic Asset Allocation, which is in close proximity to the allocations of an identified peer group. To quote Arnott (2003) again: "Many of the worst errors in investment management can be traced to an industry-wide focus on maverick risk."

Some investors invest in stocks directly themselves. This has its own issues, principally that the average fund manager does not outperform relevant market benchmarks, see for example, Arnott et al. (2000).

The case of managers-of-managers is less well documented in the literature. The premise is that by injecting a degree of skill, experience, and diligence into the manager selection process then outperformance is possible even if the average manager does not outperform. Consider the quarterly survey of the implemented consulting (i.e. manage the manager) products of six leading brand asset consultants by CPG Research & Advisory, for 27 consecutive quarters from 30 June 2002 to 31 March 2009. It shows the return before fees of the implemented consulting product for each asset class for each consultant alongside the benchmark return for that asset class. Thus, outperformance can be computed every quarter for each asset class for each consultant. If the asset allocation for each asset class was known then the total outperformance for each multi-asset class product could also be calculated.

For the sake of simplicity, the analysis below constructs an identically weighted hypothetical multi-asset class portfolio for each quarter for each consultant using a fairly common asset allocation for a growth portfolio[1]. For each of the 27 quarters, the outperformance of each consultant is defined as the average of the outperformance of that consultant across all of the asset classes, where the weights for the average are given in Figure 1. For example, if in a given quarter, the consultant outperformed the Australian Equities benchmark by 1%, underperformed the Property benchmark by 1% and matched the benchmark in the other asset classes, then the Outperformance for that quarter (before fees) is 0.29% = 1% × 36% - 1% × 7%.

Figure 1: Hypothetical multi-asset class portfolio

Asset Class	Australian Equities	Int'l Equities (Unhedged)	Property	Australian Fixed Interest	Int'l Fixed Interest	Cash
Allocation %	36	27	7	15	10	5

Source: Investment Science using Mercer data.

In addition, the following assumptions were made:

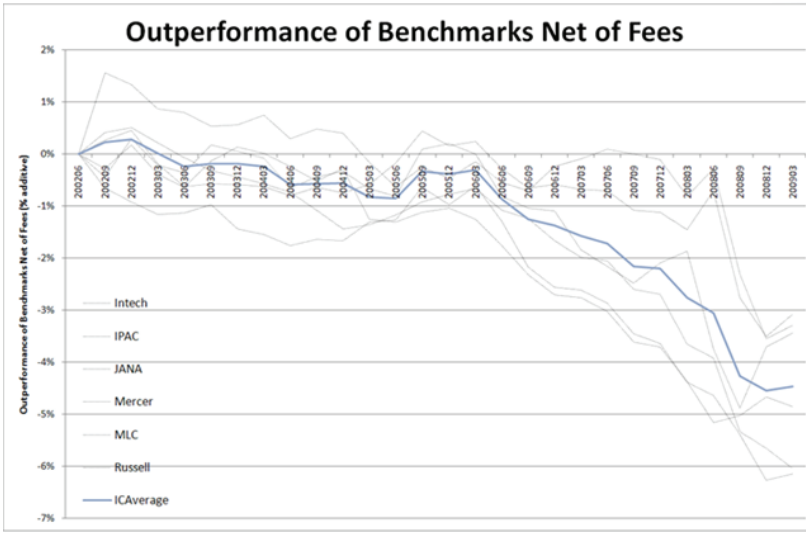
1. There were no transactions costs in rebalancing portfolios.
2. Missing data was filled in as the average outperformance of the other consultants.
3. There was no Cash asset class in the survey, so outperformance was assumed to be 0% for this portion.
4. Fees were assumed to be 0.9%pa, which covers the manager's fee, the consultant's fee, and all the administration fees.

Figure 2 shows the cumulative arithmetic outperformance[2] as described above. While the equal-weighted average outperformance is highlighted, the path of outperformance of each implemented

[1] Each allocation is within 2.2% of the Asset Weighted Average of the Balanced Funds in the Mercer Pooled Fund Survey as at 30 April 2007 (the last such survey).
[2] The cumulative arithmetic outperformance over the period is calculated by simply adding the outperformance for each quarter.

consultant is indistinguishable from each other because the point of including them is not to show which has the highest or lowest outperformance, but to give an idea of the spread of outcomes.
For the first 15 quarters to 31 March 2006, the outperformance was generally flat, averaging -0.08% per annum. However, for the remaining 12 quarters the managers dramatically underperformed, averaging -1.39% per annum, with the very best manager underperforming by -1.05% per annum.

Figure 2: Multi-manager cumulative arithmetic outperformance



Source: Investment Science using CPG Research & Advisory data

Furthermore, outperformance is correlated with the equities markets, in other words, it is not truly alpha, where alpha is considered to be independent of market returns. This can be expected due to the possibility that the consultants in this survey have extended their asset class product to include allocations to higher beta sectors such as small caps, emerging markets and credit. Any of these allocations would tend to cause correlations of the outperformance of those asset classes with the broad market capitalisation weighted indices that are used as benchmarks. This is indeed the case. The correlation of the average quarterly outperformance to Australian equities[3] is 0.48, and has a p-value of 0.0106 (that is, it is statistically significant at the 1% level). Australian equities outperformed Australian Cash[4] over the period by 1.49% per annum[5], so this should have provided a boost to outperformance. When the adjustment is made for this Beta-boost from equities, the annual underperformance is reduced to -0.69% per annum over the full period of 27 quarters.

At the end of the period, even the best-performing consultant underperformed by -0.46% per annum after fees (or +0.44% per annum before fees), and with a p-value of 0.16 (that is, at a level where the underperformance is not generally considered to be statistically significant, but close to it). Note that

[3] Measured by the S&P/ASX200 Accumulation Index.
[4] Measured by the accumulation of a notional account invested at the RBA Cash rate.
[5] Measured by averaging the quarterly return series of Australian Equities and Australian Cash, multiplying by four to convert to annual returns and taking the difference.

this best-performing consultant has outperformed the average of its peer group by only 0.20% per annum, yet it is has still underperformed by -0.46% per annum. Given these statistics, consider the task of an investor considering an attempt to add value by mimicking the activities of these consultants. That investor must not only be the highest performer out of this peer group, but must perform at a level above the average of the peer group (by 0.66% per annum) that is *more than triple* that which has been achieved by the current best performer.

This is not designed to be a critique of implemented consultants, except to the extent that their only value proposition is to construct portfolios of *managers* in the *traditional asset classes* with a mandate to outperform the *broad market capitalisation weighted indices*.

STRATEGIC RISK ALLOCATION

How should risk be defined and measured?

For the purpose of distinguishing between the size of risk between different portfolios for those saving for retirement, the expected standard deviation of a portfolio is the most suitable measure of the risk of investment returns. Taleb (2007) provides an eloquent criticism of the application of normal distributions and standard deviation measures of risk to financial markets returns. However there are several reasons why those criticisms do not apply to the purpose being considered in this paper:

The longer the time frame, the more the annualised returns look normally distributed, and the lesser the impact that short, sharp, events have on the statistical distribution of equities markets due to the mean-reverting nature of equities markets. This has been observed in the Australian equities market by Fitzherbert (1992). One reason for this has been proposed by Smithers (2002) who reasons that where stock prices are cheap, it is better to buy the shares of existing companies rather than to establish new companies, and when stock prices are expensive it is better to establish new companies rather than to buy shares in existing companies. In both these cases, the price of listed companies tends to revert to fair value, albeit over very long time periods of upwards of 20 years.

- The more diversified a portfolio is, the more the annualised returns look normally distributed. This would be expected due to the feedback loops and surprise events that afflict the return series of any single market, but which should even out when the composite return series from across many different markets and strategies are considered.

- If higher moments of return distributions (e.g. skewness[6] and kurtosis[7]) were modelled would investment decisions be any different, anyway?

[6] "Skewness is a measure of the asymmetry of the probability distribution of a real-valued random variable. (www.wikipedia.org, August 2009)

- As other uncertainties, risks, and path-dependant responses are added into the mix for consideration by the financial planner and client, this dilutes the importance of the skewness and kurtosis assumptions for investment returns on the whole planning process.

- The risk of massive falls in account values can and should be addressed by prudent guidelines that avoid concentration risk; such guidelines are already well-embedded in industry practices.

To quote Arnott (2003), as to which risk is the most important: "Whichever one hurts us, which cannot be known until after the fact." For retirement savers, the risk that would hurt the most is the risk of outliving their retirement savings, and not the year-to-year volatility of investment returns as measured by the standard deviation.

The point of using standard deviation is not that it measures the risk of outliving retirement savings, but is a lever that can be adjusted to manage that risk.

Standardising the measurement of risk under the SRA framework

The use of standard deviation as a measure of portfolio risk in the investment management industry is as old as Modern Portfolio Theory itself. However, there is no standardised way of estimating the standard deviations and correlations of asset classes that are to be used by retirement savers to calculate the standard deviations of their portfolios. If different sets of standard deviation assumptions were used by different industry participants, it would lead to confusion by consumers. If one product provider declared that its portfolio has a standard deviation of, say 9% per annum, another product provider may declare that their competitor is misleading consumers because according to their asset class assumptions, that same portfolio has a standard deviation of 11% per annum. It would be difficult to determine who is right.

To avoid the problems of lack of comparability between products managed by different providers, a *standard* set of assumptions should be adopted across the industry that allows ready comparison between different products on the same basis. For this reason the concept of SRA provides a measurement framework that could be adopted by the industry, whereby any multi-asset class portfolio can be verified on an ongoing basis that it is managed on a basis that targets its designated standard deviation target. For example, an SRA-4 portfolio targets a standard deviation of 4% per annum.

The designated standard deviation target of each SRA portfolio is verified and licensed by SRA Institute Pty Ltd as being managed within the SRA framework. The key points of the SRA framework are:

[7] Kurtosis is a measure of the "peakedness" of the probability distribution of a real-valued random variable. Higher kurtosis means more of the variance in returns is due to infrequent extreme deviations, as opposed to frequent modestly-sized deviations. (www.wikipedia.org, August 2009)

- The risk must be actively managed. This counts out single asset class portfolios that are benchmarked to an index because the risk of the components in the index may change considerably.
- The time horizon for the product must be at least three years.
- The composition and historical performance of the portfolio is regularly submitted to the SRA Institute Pty Ltd. The portfolio may be threatened with a change to its designated standard deviation target should its risk characteristics be persistently higher or lower than the target over a long period of time.

Any other standard deviation target that is not verified by SRA Institute Pty Ltd is a volatility target and is not in accordance with the SRA framework. This is not to say that this framework is superior or more accurate or more applicable, nor is it more up-to-date than any other framework or model. However, arguably, it is more important to facilitate consumers to be able to reliably rank the risk of different products from different providers.

Thus, the use of standard deviation via the SRA framework has the advantage that it counts all risks in a portfolio in a single unambiguous measure.

It is possible to efficiently aggregate the portfolios of multiple managers and direct investments in standard asset classes to arrive at a single unambigious measure for the total risk in clients' portfolios.

Simultaneous management of buckets, allocations, benchmarks, managers and risk

So far, this paper has provided a critique of the Strategic Asset Allocation approach. The alternative approach, Strategic Risk Allocation, or SRA, is actually quite simple:

1. Set the investment guidelines:
    a. Define a risk budget for the entire portfolio (that is, the designated standard deviation target, for example, SRA-4 for a 4% per annum standard deviation target).
    b. Set the rules regarding the allowable investment instruments to ensure that the portfolio is sufficiently liquid to facilitate the realisation of cash as and when required.
    c. Set boundary constraints to avoid concentration and avoid blow-up risks, but wide enough to allow meaningful positions to be taken. For example, limits could include:
        i. Maximum allocation to a single stock in developed markets of ±3%;
        ii. Maximum allocation to a single stock in emerging markets of ±1%;
        iii. Maximum allocation to the equities market in a country with a diversified stock market of ±50%;
        iv. Maximum allocation to the equities market in an emerging market country of ±10%;
        v. Maximum allocation to the bonds of any one government rated at least AA+ of ±50%;
        vi. Maximum allocation to any one foreign currency of ±30%;

vii. Maximum allocation to any one portfolio manager or team of portfolio managers of 20%;
viii. …and so on.

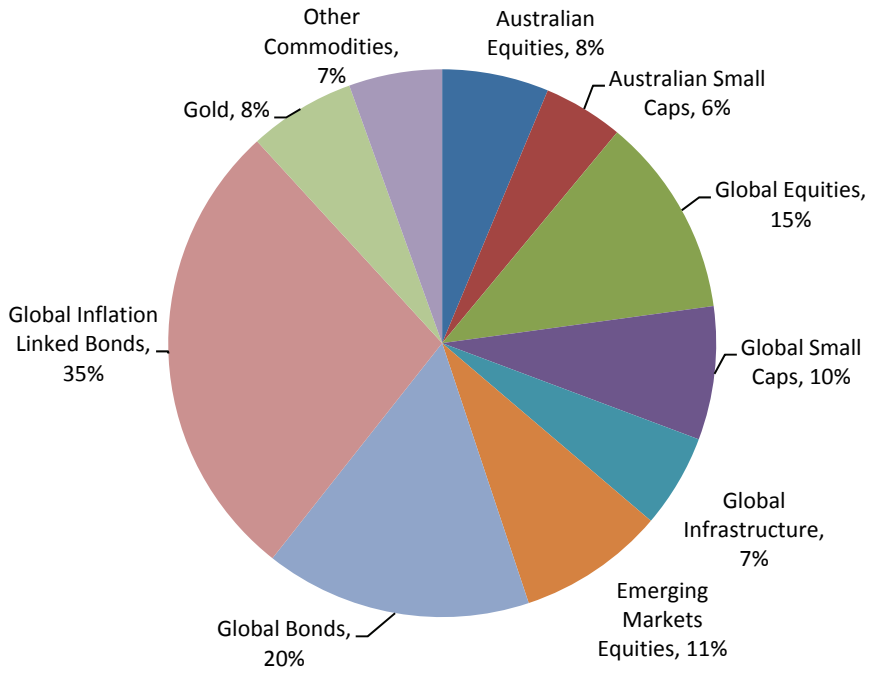
2. Use all investments, strategies, instruments and techniques that in the manager's opinion, add value.

Hypothetical example

There are many ways that the risk budget could be achieved - and that is the point. The portfolio manager can play to its strengths and advantages, and can rotate investments to those that have the most favourable valuation levels, and the greatest opportunities for stock selection.

As an example, consider a portfolio managed using the SRA approach in Figure 3.

Figure 3: A portfolio constructed using the SRA approach – asset allocation



Source: Investment Science

By viewing the portfolio such that allocations to extended asset classes are allowed to have a distinct and sizeable allocation, the portfolio looks much more diversified than a typical balanced portfolio where the allocation to equities usually dominates.

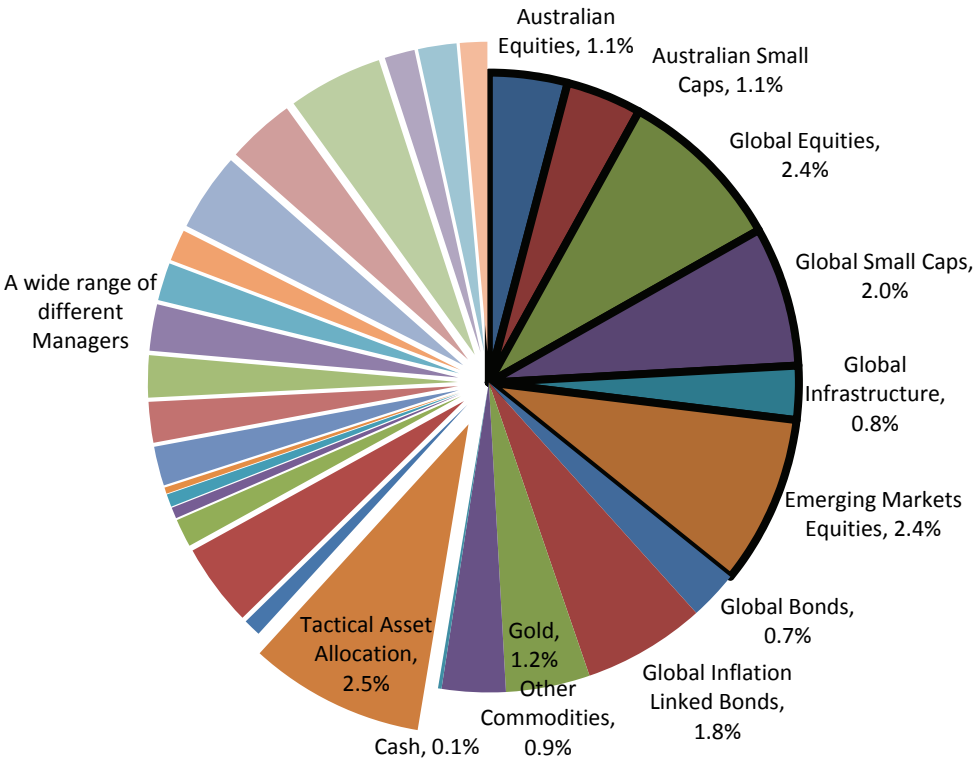
Note, that the allocations add up to greater than 100%. By allowing flexibility in the type of instruments used, some of these market risks can be obtained in the form of derivatives, which

allows the market risk in the low risk asset classes to be leveraged up. This is a technique described by Ray Dalio (2005), in what he calls Post Modern Portfolio Theory.

What is not shown in Figure 3 is the allocation to strategies.

In Figure 4 below, the the 2.4% risk of international equities is equal to the 15% allocation from Figure 3, multiplied by the estimated long term standard deviation of international equities of 16% per annum. It also assumes a risk allocated to Tactical Asset Allocation and to a wide range of different managers. It is easy to see that this is a very well diversified portfolio.

Figure 4: A portfolio constructed using the SRA approach – risk allocation



Source: Investment Science

The example above is not a recommended portfolio, nor a real portfolio. It highlights the level of diversification that can be achieved under an SRA approach. Diversification is the investors' free lunch, which is the point that Markowitz was trying to make in the quote at the start of this paper. For too long, people have focussed on his method instead of his main message.

Conclusion

Despite all the evidence that there is something amiss with the current industry conventions regarding portfolio construction, there have been relatively few institutional investors who have had the courage and conviction to distinguish their portfolios from their peers.

Two notable examples of those who have and have reaped the rewards for their investors over long periods of time are:

- In the United States, the Yale University Investments Office has an approach involving a large allocation to private equity, hedge funds, emerging markets, and direct investments in projects. This approach is explained by David Swensen in his book, *Pioneering Portfolio Management*.
- In Australia, the MTAA Superannuation Fund allocates over 50% of its portfolio to a "Target Return" portfolio, comprising direct investments in infrastructure, property, private equity, high yield debt and natural resources.

The advent of Strategic Risk Allocation as an approach and SRA as a standard helps eliminate the maverick risk for all investors. It seems that institutional investors cannot ignore maverick risk because there is a tendency to benchmark performance against peers. In theory, at least, if an institutional investor uses an SRA approach, it has no peers because there is no defined growth/income split for the fund to be categorised in surveys.

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