
Invited Editorial

The long and active existentialist

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ABSTRACT This contribution casts a critical eye broadly at empirical active management in the conventional regulated long-active fund setting. All long (fully invested) and active funds (sometimes termed 'long-only active') take on risk with regard to some nominated performance benchmark, for example, an equity index. In so doing, they employ a risk budget. We focus on the frequently misunderstood topic of risk budgeting in this applied (as opposed to theoretical) domain. Active investment management is about understanding risk budgeting, and therein, the possibilities, the merits and the shortcomings of being active. We discuss two ubiquitous practical fallacies. The first, while typically understood, is also uncommonly ignored, and relates to the forced coupling of strategic equity benchmarks to sources of value-add. The second misnomer derives, in part, from not appreciating the full consequences of the first. There is a commonly held outlook that the size of assets under management is in some way directly related to the possible size of dollar-nominal value-add. In other words, whereas a large equity asset base (given some skill) can derive a specific dollar-nominal excess return, a smaller equity asset base cannot derive the same without taking on a different (excessive) value of dollar risk. We demonstrate in largely non-mathematical prose that the risks taken to generate the same dollar nominal, for the same skill set, are equivalent. We discuss why an understanding of these issues by trustees, plan sponsors and financial practitioners is going to become increasingly important in terms of being able to successfully navigate the waters (regardless of how choppy) of active management. We argue that many of the current practical debates – ranging from active versus passive investing, hedge funds versus long-active, through to the basic cornerstones of active remuneration – are artifacts of not fully appreciating the finer detail of risk budgeting that is often not easily accessible (although most often correctly stipulated) in the mathematical finance literature.

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INTRODUCTION

There is a subtle but pernicious disconnect in asset management, between what is deeply implied in practice (incorrectly) and what is cursorily understood in theory (correctly). This disconnect resides within the broad conception of ‘active’ management – in both its nature (that is, the character of active management) and quantum (that is, how ‘active’ must one be to be deemed active?). The consequences lead to many unnecessary dialectical separations within discussions on investments and investment philosophy. Specifically, this problem within active management relates to risk budgeting, and will appear, at worst, to be a trivial concern. We hope to demonstrate the understated consequentiality of this conceptual conundrum in this article.

The majority of individuals’ wealth the world over is invested in ‘active’ investment vehicles. This includes pension funds, retirement annuities, mutual funds and the like. Typically, these funds are coupled with a performance benchmark. We consider only equity funds benchmarked to some notional equity index.¹ What renders all these investments active is that somewhere, a manager or investment expert imputes her discretion, at times, as to where the value resides in the equity market. She will do so implicitly by assuming contrarian bets to the same benchmark. The extent to which her view differs from the benchmark will manifest as active risk (measured by the likes of a tracking error, for example). If the manager had no active views, the fund would mirror the underlying benchmark, and would be deemed to be ‘passive’.

Long-only active equity management, as it is frequently referred to, that is, management of an active equitized portfolio established on and around a long-term strategic benchmark, is concerned with many things. On the top of this focus list should be attempting to grow risk capital over and above the risk-free rate.² Also featuring prominently would be the issue of

identifying skill, and of translating that skill cleanly into active bets. These are some of the ultimate objectives relating to the value-add of any active fund manager. However, the proximate mechanism through which active managers will create this value-add is directly through risk budgeting,³ and, nested within that framework, portfolio construction.

Active investment management is about understanding risk budgeting, and in so doing, understanding the possibilities, the merits and the shortcomings of being active. Risk budgeting is the process of allocating an allowable measure of potential loss to (hopefully) value-creating aspects of an investment process (Lee and Lam, 2001; Figelman, 2004), and nowhere is the value-add potential of active management more pertinent than when it comes to understanding this.⁴ An active manager seeks to maximize the value-add or ‘alpha’ from her investments subject to some imposed loss (analogously ‘risk’) constraints.⁵

There is certainly no lack of evidence suggesting that the framework established by Harry Markowitz is well accepted as well as widely used. The notion and practice of risk budgeting flows directly from a theoretical mean-variance interpretation, and there are ample examples of where the same is being prudently applied. That said, there appears to be an obvious disconnect between the algebra and logic of mean variance (and all its offshoots) and the conceptualization and understanding of what active management is fundamentally about in practice. Specifically, we consider the following two practical notions incongruous with modern portfolio theory:

- (a) *An active manager’s value-add is coupled to her strategic benchmark* (1)

This first fallacy relates to the obligatory coupling of a strategic equity benchmark to a perceived source of value-add.

This fallacy, although reasonably well understood by many professionals, is

surprisingly well ignored in practice by the bulk of the financial services industry the world over. There are several possible reasons for this oversight – the most diplomatic explanation would simply note issues of deep legacy.

- (b) *The dollar nominal of value-add is related to the size of assets under management (AUM)* (2)

This second fallacy is noticeably more complicated than the first, and is not well appreciated by most investment practitioners, although it is certainly implicit and well cast in theory (see footnote 4). This misconception relates to a basic tenet of risk budgeting and is best described as a question of two parts:

- For a given (positive) skill set, how much absolute dollar risk does an asset base need to be exposed to, to create a specified dollar-nominal reward? and
- would a smaller asset base be taking on different absolute levels of dollar risk to generate the same dollar-nominal reward?

Interestingly, the second fallacy derives from not fully appreciating the full consequences of the first fallacy. The second fallacy is considerably more deleterious than the first, however. We deem that many of the current debates (for example, hedge versus long, active versus passive and the basic principles of active remuneration) are very much artifacts of not fully recognizing these two accepted notions as literal falsehoods.

The discussion that follows is not intended to challenge technical work on either risk budgeting or mean variance (which as we note is largely correct). Rather, it is intended to clarify how an appropriate understanding of the same can be thought of in essentially non-mathematical prose, and in so doing, clarify issues pervading current investment debates and discussions. The motivation for highlighting the same in this contribution is the perpetual hope that investors can be better rewarded, and

manager skill more correctly identified and incentivized.

AN ILLUSTRATIVE EXAMPLE AND THE DISTRIBUTION OF ACTIVE RISK

We consider the intentionally oversimplified case as an example. I invest US\$100 in a long-only active equity fund manager who only stock-picks, and who does so on a beta-neutral and dollar-neutral basis.⁶ Without a doubt, given standard long-only active risk mandates, the greatest driver of most equity funds' performances will come from whatever the strategic equity benchmark is.⁷ The choice of that benchmark will be the single most important investment decision made in the long-only active equity space. The magnitude of that decision will almost always dwarf the importance of the manager's active selection or any subsequent alpha value-add – of this there is little debate.

Given that the active universe is a zero-sum game, and the unambiguous consequentiality of a strategic benchmark, what happens in the active space should be of little concern to most long investors. It is surprising then that there exists a fierce and lucrative long and active asset-management industry centered on the sole marketing tenet that any active fund has a reasonable chance of being on the correct side of wrong. Perhaps this ambition alone is forgivable, although it is statistically unsound. Less forgivable are the numerous fallacies, misgivings and misunderstandings that professional investors propagate and trustees and investors absorb regarding what it is that active managers are actually doing.

I invest my \$100 in a long-only active stock-picker. They hope to deliver a 2 per cent per annum outperformance of some benchmark by assuming tracking error risk of 5 per cent per annum. I am also therefore paying the fund manager for her

competency in adding value through assuming contrarian bets in the portfolio to that of the benchmark. To add 2 per cent per annum with a tracking error of 5 per cent implies an Information Ratio (IR) of 0.40 (IR = active alpha/active risk). The ‘risk budget’ of the manager is, for all intents and purposes, 5 per cent.⁸ Tracking error is the standard deviation of the relative returns of an active fund, and is a measure of how closely a portfolio follows a basket of constituents to which it is benchmarked. Tracking error has a simple probabilistic interpretation. The returns of a fund with a tracking error of 5 per cent will have a 68 per cent (or 1 standard deviation) chance of losing up to 5 per cent (that is, -5 per cent) or making no more than 5 per cent (that is, +5 per cent) over and above the returns of the benchmark (Figure 1).

Hence, tracking error in statistical parlance can be considered the interval that sweeps out approximately 68 per cent of the area under the normal probability distribution curve. The area is symmetrical about the mean. We define Z as the normal deviate. $N(z)$ denotes the area under a normal distribution function such that $N(z) = P(Z < z)$. Note $N(z)$ is one-tailed. If we define z_1 and z_2 as values a distance from

the mean, then the area between z_1 and z_2 is $N(z_2) - N(z_1)$. This area represents the tracking error interpretation. Note how $1 - [N(z_2) - N(z_1)]$ defines the area outside of the normal deviate range, as identified in Figure 1.

In a standardized normal (z) distribution (with mean = 0 and standard deviation = 1), a 1 deviation corresponds to an area under the two-tailed z -curve of 0.683. Tracking error can usefully be thought of as a risk budget. Equally, we could cast the same risk budget into a VaR framework that has a similar yet more extreme (1-tailed) probabilistic interpretation.

Suffice it to say, I am giving the manager the discretion and responsibility to put \$5 of my \$100 at risk to presumably enhance the returns of the benchmark performance. Under probabilistically atypical circumstances (that is, with a probability of less than $1 - 0.638$), I am prepared to part with the \$5 or more.

What is vital to note here is that (i) there need not be this direct link between the strategic asset-allocation decision and any source of value-add or ‘alpha’, and (ii) ‘at risk’ has a specific statistical interpretation in terms of tracking error.

We examine some vital corollaries to these realizations to better understand risk

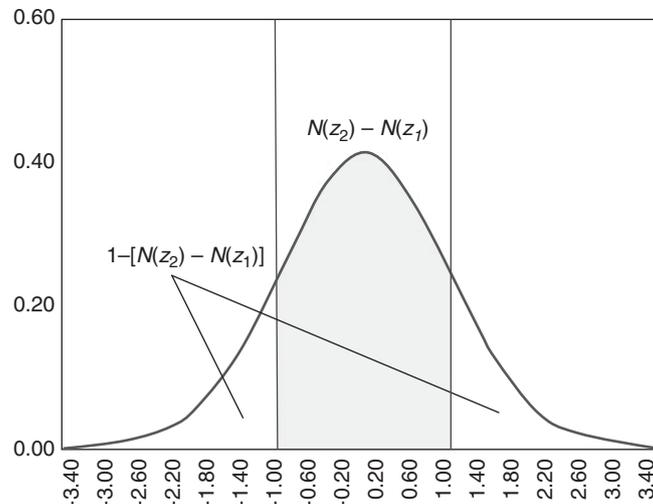


Figure 1: A diagrammatic representation of tracking error as a 1-standard deviation event, symmetrical with regard to a distribution with mean 0 and standard deviation of 1.

budgeting, what is implied by risk budgeting, and why the modernity of basic financial engineering is required to make the necessary and correct practical conceptual leaps.

FALLACY 1 – IS A FORCED COUPLING OF ALPHA TO BETA ESSENTIAL?

If I collateralized a total of \$5 at risk using the same skill-set as the abovementioned fund manager, and invested \$100 in the same benchmark, would there be any material or qualitative difference between my investment in the first and this alternative structure? No there would not be, all else being equal. The example of 5 per cent tracking error with an IR of 0.4 would return the same nett dollar value profit of \$5 were 100 per cent at risk with a passive benchmark attached, or \$100 in a benchmark with 5 per cent at risk. One could place \$5 at risk on the stock market⁹ and invest in \$100 of index future exposure, for example.

More interestingly, all else is not actually equal. There is compelling evidence showing how the transfer of information into fund managers' active bets is significantly better when benchmark agnostic (Clarke *et al*, 2002a). Hence, the engineered solution would promise not only fairer costing, but also (where skill is evident) a richer source of alpha. Can we imply that the forced joining of a value-add component to a strategic benchmark may be a bad thing?

Unequivocally yes. It is, in fact, the greatest source of value destruction for skilled long-only active fund managers. For mediocre fund managers, it is the convenient wet peat behind the smoke and mirrors. A forced separation of active risk and passive benchmark vehicles would focus more attention on the consistency and quality of aspects of active managers' value-add.

Why does the industry largely comprise massive equitized static asset bases around

which professionals are simultaneously attempting to add value? The fit seems natural unless one thinks harder about it. Admittedly, this configuration is unlikely to change anytime soon, owing to issues of inheritance, in all actuarial, regulatory and legal constructs. However, there is still an obvious need for further education among trustees and plan sponsors to overcome lethargy and earnestly initiate any of the required change here.

FALLACY 2 – DOES A MANAGER REQUIRE THE FULL \$100 TO MAKE \$2 PROFIT?

The answer to this question is a simple 'not at all'. AUM implies very little in terms of the capacity for value-add. It is all about risk budget, and how effectively this is applied in practice. A common argument raised in favor of retaining the current structure – coupling a source of value-add along with a strategic benchmark – is that an alpha silo simply cannot generate the same dollar nominal without being associated with the strategic benchmark, or more specifically, the dollar value of assets invested in the same strategic benchmark. The argument is fallacious, but goes something like this:

We run a total of, say, \$10b assets under management. Our active return per annum is mandated to be in the order of 2 per cent with a tracking error of 5 per cent. Hence, we need to generate \$200 m in alpha from a silo that will have as its capital base, \$500 m. That's a return of 40 per cent on equity. That's far from possible. It's far easier to generate \$200 m in alpha from \$10b, being 2 per cent.

This understanding is commonplace.¹⁰ The consequences of this understanding are very real and onerous. It is not very difficult to prove this understanding wrong. Consider that the IR deemed fair or obtainable from the above example is 0.4 (for example, 2 per cent outperformance per annum for a

5 per cent tracking error per annum). Our example shows that our mandate stipulates a risk budget of 5 per cent, and then the alpha silo is permitted to expose the \$500 m (being 5 per cent of \$10 billion) to 100 per cent risk. In other words, the alpha silo can lose or double all of \$500 m and still be within the risk mandate. At a perceived IR of 0.40, and at 100 per cent of the risk budget, the dollar-nominal return from the alpha silo is expected to be 40 per cent – in other words, the \$200 m noted above. In this engineered example, one would utilize the entire active risk budget of the fund in the alpha silo, via collateralizing a long-short position. In principle, there is no difference between these two dollar-generating offerings (see, for example, Litterman, 2004).

Note that any dollar-nominal alpha number is achievable through financial engineering principles where a positive IR is present. The degree to which capital is utilized to achieve this dollar amount is solely a function of the risk budget, and the proportion of the risk budget devoted to this task. This position may be leveraged as and when necessary, but leverage is not always necessary.

Pragmatically, however, explaining to an investor why a skilled stock-picking team should be wholly benchmark-agnostic does not resonate well. Furthermore, collateralizing the same team with hundreds of millions of dollars and asking the team to double or lose the risk capital as part of their ordinary activities is a hard sell, as it sounds too much like gambling. But the principles are exactly the same, and the dollar value of risk is exactly the same – whether housed as part of a larger asset base or externalized on the basis of a risk budget alone. Also difficult is convincing an investment team – a team that is used to hiding behind the noise of choppy seas – to do the same: to sail so close to the wind on a flat lake.

Undoubtedly, an alpha-silo separation from the benchmark's return (whether run as a separate implementable solution or simply

as a paper exercise) would render skill much more obvious and make management's job considerably easier and the industry both more fair and efficient. However, it is unlikely to be a popular solution among the unskilled.

CONCLUSIONS

An implicit recognition of the value-add of long-only active equity management needs to be aware of how much and where a risk budget is employed, and separate that risk budget from the equitized benchmark component in order to understand the merits of being active. We do not motivate for a physical separation of risk budget and benchmark – there is too much stacked up against a clean practical implementation of the proposed decoupled benchmark and independent risk-budget (or alpha-silo) solution. However, even when this severance is simply done notionally it is self-evident that reporting and understanding of such a partitioning is critically redeeming. We note the following:

- The value-add of a skilled investment team, in dollar terms, does not need to be tied to the capital base or benchmark over which it may be employed.
- Uncoupling of the sources of value-add from static long-term strategic benchmarks (where possible) is not only feasible, but promises cleaner separation of notional sources of value-add,¹¹ and higher (unhindered) alpha (where skill is present) owing to the nature of portfolio constraints, and how these impact on the distribution of active bets that can be assumed at any moment in time.
- Decoupling and externalizing the risk budget from a static equitized capital base has many benefits – the principal ones being accountability and transparency.
- We note that the relevant benchmark for active risk is always a risk-free benchmark.

It is often active management's practical inability to comprehend exactly what it is doing that renders much of the task of rewarding or penalizing the skill (or lack of it) therein incomprehensible. A change in mindset and accountability is the real issue, rather than secondary challenges relating to the engineering of such a risk budget, and concomitant value-add in dollar-nominal terms. The ramifications of being risk-budget cognizant are many, and the misperceptions of not being so aware are also numerous. Consider the following questions that revolve around equivalent misinterpretations of risk budgeting:

- To what extent does the industry care to distinguish between AUM and the amount exposed on risk budget? How often will a market-neutral stock-picker be compared as equivalent to a long-only active quants house, for example? If no such discrimination is possible, can there be any real discernment in the value-creating aspects of active managers?
- Do investors demand the separation as best practice? Would the obvious preoccupation with ex-post performance measurement be rendered simpler if fund managers had the processes in place that implicitly separated out risk capital from the static capital base?
- If a modern portfolio management firm entrusts a portfolio manager with a risk budget alone, and purchases a strategic benchmark independently, does this imply that the portfolio manager is operating a hedge fund? It is worth bearing in mind that no short-sales are necessary to transpose the same active bets that were manifest in a conventional long-only active fund into an independent alpha silo (the portfolio manager essentially borrows scrip from the core without the need to short-sell). However, short-sales may be encouraged in certain frameworks to pick up the portfolio manager's transfer coefficient.
- Distinction between and debates around active and passive management are rife in the literature. Yet, the only active part of a long-only active fund is the risk capital employed as a function of the risk budget. The residual asset base is passive, in so far as a strategic benchmark is purchased once and thereafter held (and rebalanced as necessary). The notion of 'active' is entirely fallacious – active management is less binary than it is continuous, and places long-only active funds closer to the passive end of the spectrum for obvious reasons.
- The distinction between hedge funds (being an 'everything else' asset class, *sensu* Bookstaber, 2003) and long-only active funds blurs considerably. The only difference between the two, when viewed as a function of risk budget alone, is that one is severely constrained and bundled onto a strategic benchmark whereas the other is not.
- Do we pay active portfolio managers as a function of the size of the asset base or the magnitude of their value-add? How frequently can and will remuneration recipes within large institutional fund managers be mindful of the differences here? When will a 2/20 hedge fund remuneration recipe on a small asset base (with a large risk budget) converge with the recipe (say, a fixed basis-point fee) of a large pension fund with a small risk budget? How different are these two solutions currently from where they should be?
- A fairly common line of reasoning in the promotion of index tracker funds (or simple ETFs) relates to the impact of management costs and the dubious value of consistent investment performance.¹² Many providers of such low-cost index solutions often further look to demonstrate the benefits of combining tracker funds with actively managed long-only funds. How they plan to do so is typically through simple apportionment. From a product point of view, hybridization offerings are alluring here.

On the face of it, an investor gets a cost-efficient core with some degree of the more expensive active components on the periphery. However, the idea of simply blending passive tracker funds with conventional long-only active funds betrays a lack of understanding of risk budgeting, and why some specified degree of active risk is assumed in the first instance. The precept is simple to understand. Most conventional long-only active funds are already largely tracker funds. A generic blending of a passive core with a constituent active fund with a defined risk budget will only further dilute the risk budget of the nett offering. To preserve a risk target in such circumstances, the tracking error of the active fund would need to be increased, often greatly. The initial motivation of 'blending' was to reduce costs and enhance consistency of returns. If, however, tracking-error dial-up solutions can be practically implemented, then it should become immediately evident that a clean and total separation of risk budget from passive core is the correct way to approach the costing and persistence of value-add, rather than an ineffectual and half-baked solution that dilutes the risk budget.

- The understanding that one can simply blend active and passive components to add value in active management is the latent death knell of multi-management. It is commonplace to attempt to combine several long-only active managers in an attempt to diversify one's active offering while concomitantly outperforming a nominated strategic benchmark. From a pure financial-engineering point of view, the conditions in which one could accomplish the same would only be realized if the nett contribution from all active components of the custodian funds was positive. One will frequently find that the correlation among active components of custodian funds are either positive

(rendering diversification hopes moot) or negative (rendering the nett offering much the same as the benchmark, except now less several layers of costs). It takes some degree of quantitative savvy to understand the correlation between sources of active risk in order to multi-manage more effectively, at any level. Although mean-variance (and similar) technology offers accessible solutions to the same problem in portfolio construction and asset allocation, there has been little work done on apportioning a defined risk budget to a suite of long-only active custodian funds. The work of Berkelaar *et al*, 2006 is unusual and exemplary in this regard with its focus on correlation-adjusted information ratios.

- Lastly, it is worth asking whether high-conviction (or 1X0/X0, short-extension) funds are understood by most to imply a higher-risk budget? Do these funds always assume higher active risk levels than conventional fund structures, and if so, why? To what extent do 130/30 funds represent an imperfectly engineered risk-budgeting solution, that is, the long-only active fraternity's answer to the value destruction brought about through active bet constraints (via a forced coupling of benchmarks to value-add) or more owing to the allure of a hedge fund remuneration recipe? Are they an intermediate and, in many senses, forced solution, and can one derive the same or similar solutions via other simpler risk-budgeting routes?

We hope that this report contributes in some small way to a heightened understanding of the debates around active management.

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NOTES

1. Benchmarks for pension funds (and the like) are typically composites of different asset classes. Active management around this composite will entail tactical asset allocation across asset classes, as well as active risk being employed within each asset class. Most often, these composites include some varying degree of equity. In order to portray the conceptual impasse simply here, we consider the oversimplified case of an active equity portfolio against an equity benchmark alone. We note that the universe of equity constituents in the active portfolio may or may not be the same as that of the nominated equity benchmark.
2. Risk capital is equivalent to the notion of capital employed that is at risk. One could theoretically collateralize a long-short position with no value-at-risk (VaR), and the nominal dollar value of risk capital there would be zero. Conversely (as in the case with long-only active mandates) one equitizes (to a nominal benchmark) some monetary value, and then establishes a VaR amount by going under and overweight that same benchmark. The nett VaR is the dollar amount that is exposed to risk, and should be the same dollar amount that one is attempting to grow over and above the risk-free rate. The risk-free rate, although not necessarily the most relevant performance index for the multifarious types of unconstrained active management types (Callin, 2008), is certainly the most pure when it comes to benchmarking any value-add in active investment, and is no different in long-only active equity management. In long-only active mandates, the capital employed is fully equitized and the nett exposure of active bets is zero. The sum of overweighted and underweighted stocks equals zero. Active risk is implicitly assumed by taking on tracking error (or VaR) as proceeds of the short (underweight) sales offset the long (overweight) purchases. The active return of the resultant active gambit is most correctly judged against a situation in which no underlyings are repurchased and the proceeds are channeled into a cash investment (or analogously, no underlyings are sold and the cash is borrowed to fund the overweights). Active investments must always, out of necessity, revert to a cash contrast. This notion is implicit in theory and practice in the world markets, but less so in the minds of many investment professionals.
3. Risk budgeting and asset allocation overlap in many important respects, but differ in the sense that asset allocation (i) concerns itself with optimal weights (with regard to Net Asset Value) rather than tracking error (or VaR) assignments and (ii) will often emphasize deep historical correlations and volatility.
4. One typically derives a risk budget, or converts optimal allocations from mean-variance optimization into VaR assignments, using a variety of techniques. The work of Lee and Lam (2001) and Figelman (2004) is noteworthy, but perhaps more suited to a quantitative audience. For other good examples on risk budgeting it is worth reading Rahl (2000), Chow and Kritzman (2001), Clarke *et al* (2002b) and Gilkeson and Michelson (2005). Note that in none of these theoretical papers do any of the authors impute the necessity of active return relating to the size of assets under management.
5. We define alpha here as the excess returns over and above any replicable beta. In essence, it represents the unexplained term in a generalized linear model with any number of factors (risk or fundamental). In so describing and parameterizing alpha (and beta), we acknowledge subscribing to a Capital Asset Pricing Model (CAPM) world, and therefore to a world where the Efficient Market Hypothesis (EMH) is at least a valid null hypothesis.
6. This is an intentional simplification and one that suits us well for the purposes of this discussion. An active manager employing bets (at any level, for example via stock-picks or sector-tilts) that result in a departure of beta parity with that of the strategic benchmark on either a beta or dollar basis will incur a source of tracking error that is related to some notional beta source. Analytical models for understanding the same are well understood. Interestingly, models for ascribing value-add to the dynamic (tactical) shifting of beta are still in their relative infancy (c.f. Lo, 2008). It serves our purposes here to conceptualize the alpha described in this example as pure value-add through uncorrelated beta-neutral stock-picking. Of course, one would aim to expand the conclusions to non-beta-neutral investment cases.
7. We focus on equity benchmarks and active bets around the same equity benchmark. A strategic equity benchmark is assumed to be the long-term strategic benchmark. Here the strategic benchmark would be derived on the basis of estimation of multiple risk premia and imputing some stability in the long-term between-asset correlations and covariances. We could of course incorporate non-equity benchmarks and active processes around the same. However, the picture is then rendered more complex. For the sake of brevity for the current contribution, we limit our discussion to equity benchmarks and active equity bets.
8. VaR is statistically closely related to tracking error. For the sake of conciseness, we do not focus on this any further here.
9. Utilizing the same or a similar universe to that of the strategic benchmark.
10. In an unpublished survey, only 13 per cent of 23 fund managers drawn from the global professional institutional pension fund market unequivocally understood the relationship between nominal value-add and nominal under-management.
11. As a recent example of the same shows. Ibbotson (2010) notes how the answer to the importance of asset allocation policy differs when cast at gross return (*sensu* the classic Brinson *et al*, 1986 hypothesis) or when cast at an active return level (*sensu* Xiong *et al*, 2010).
12. See, for example, 'On track through difficult markets – Like a good wine, it's the blending that counts', *FINweek*, 15 October 2009, p. 64.

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