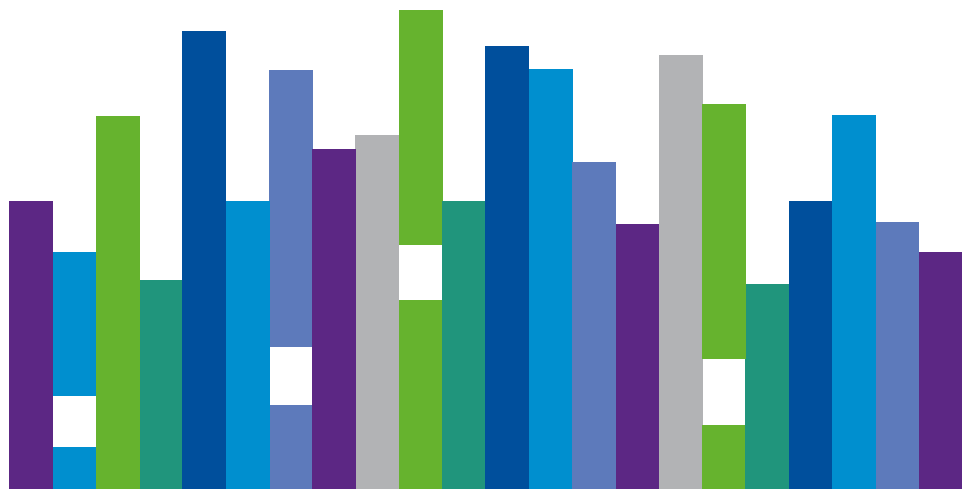# ACTIVE/PASSIVE

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DEFINITION

Passive investment vehicles track markets by holding portfolios that mirror representative indices. Such vehicles are attractive as they provide close to market returns at low cost and in efficient markets the scope for outperformance from active management is limited. Active investment approaches aim to identify opportunities to outperform a market or index and are typically more costly than passive approaches. The appeal of active investing is thought to be linked to the belief that investors will attain a higher risk-adjusted return.

Passive investment makes best sense where markets are efficient and where there is little scope for active management to generate the additional return required to justify the higher fee. However, market efficiency depends on the work of active managers. Passive managers are price-takers; whereas active managers are price makers.

As the factors affecting a security's valuation change over time, so its price should change. As the total share of assets under management invested passively grows, market efficiency may diminish (and volatility may increase) providing active managers with additional opportunities to generate excess returns. In the meantime, passive management provides low-cost access to efficient markets and maintains pressure on active management fees.

THE PURPOSE OF THIS PAPER

The growth of passively managed assets has enhanced the scrutiny of active asset managers, especially in the current low return environment. The debate is typically framed as a binary choice between either an active or a passive approach rather than focusing on the costs and benefits related to each method.

When looking to construct the most appropriate portfolio the aim is always to achieve the highest net of fees risk-adjusted return for the client subject to their requirements. Having the entire capital allocation managed either passively or actively would likely provide a sub-optimal outcome.

For an individual investor – whether institutional or retail - there would be disadvantages to having everything managed passively –

1) There are some asset classes that do not offer a passive investable alternative e.g private equity.

2) The financial markets can provide opportunities that can be exploited by active management; one example is the use of arbitrage.

3) While not all active managers may deliver value some do and this highlights the importance played by active managers in price formation, aiding the process of capital allocation and the pricing of risk.

Similarly, it would probably not make sense to adopt a purely active approach as active management is condemned to underperform in aggregate because of its role in setting the market's value and the cost of that activity.

The aim of this paper is to reframe the debate and focus on what matters – how to deliver risk-adjusted returns and how best to support clients as they seek to achieve their investment goals and objectives.

CFA UK'S POSITION AND ITS RELEVANCE TO MEMBERS AND OTHER STAKEHOLDERS

CFA UK is agnostic about whether assets should be managed actively or passively. What is important from our perspective is that the most appropriate portfolio is constructed so that it reflects the requirements and preferences of the ultimate beneficiary. Rather than 'either or' it should be a client relevant process that aims to make use of the benefits of both approaches where appropriate. Of course if the client has strong preferences we need to respect these but also ensure that the client is aware of the trade-offs related to following a mandate that only consists of active or passive funds.

CFA UK members should ensure that they choose approaches based on an objective assessment of the client's requirements. Within the CFA Institute's Code and Standards, Standard V(A) Diligence and Reasonable Basis states that –

Members and Candidates must:

1. Exercise diligence, independence, and thoroughness in analyzing investments, making investment recommendations, and taking investment actions.

2. Have a reasonable and adequate basis, supported by appropriate research and investigation, for any investment analysis, recommendation, or action.

When constructing any portfolio to meet an objective, the aim should be to use the most appropriate combination of investments that can maximise the chance of meeting the required risk-adjusted return net of costs. There are a variety of approaches that can be used ranging from all passive funds to all active funds or a combination of both. Regardless of whether the fund is passively or actively managed there must be a robust rationale for its inclusion in the portfolio. Conversely, the same rationale should apply when removing an investment from a portfolio.

The debate about active and passive styles of investment management has not always been calm and considered. This is a shame and is unhelpful, particularly as the effort involved is misdirected. It is also odd that the debate has been framed as a binary choice between active and passive approaches given the relationship between the two.

The purpose of the investment profession is to deliver clients' net risk-adjusted return objectives over their chosen time period – delivering to clients what they want at the time or times that they want it. Achieving this is challenging and the profession's record of delivery could be much improved, but the likelihood is that clients will be better served by an investment approach that is open to the use of active and passive approaches at different times and for different purposes, rather than by an approach that sticks dogmatically to one or the other.

The current low return environment has contributed to the vehemence with which the relative merits of active and passive management are discussed and reported. In a low return environment, the relatively low cost of passive investment is attractive. Recent years have seen a sharp increase in passive management's share of global assets under management. Focussing investors' minds on the cost of investing is valuable. Cost is an important factor in any calculation of net risk-adjusted return. But, while it is welcome that investors are paying greater attention to cost alongside performance, the element that is often overlooked is risk.

When a proper consideration of risk is added into the discussion, the value of having a broader set of options to create the appropriate portfolio for the client becomes much clearer.

PASSIVE PLUS ACTIVE NOT PASSIVE VS ACTIVE

The active/passive matrix below shows there are at least six ways of combining passive and active management styles with active and passive vehicles.

ACTIVE/PASSIVE MATRIX

Management style	Vehicles	Overview
Passive	Passive	A 'buy and hold' strategy where the allocations are invested at the outset in passive vehicles and not rebalanced. For example, a portfolio (50/50) of 50% in a passive Gilt Fund and 50% in a passive FTSE All-Share fund is with no rebalancing or other form of risk management. While this approach reduces cost, it is unlikely to deliver optimal net risk-adjusted returns.
Passive	Passive and Active	Here the same allocation decision is made, but is invested across passive and active vehicles. Beyond the risk management (adding and subtracting) undertaken in the active fund, no additional attempt is made to manage the risk exposure or to introduce any tactical tilts. Cost increases, but the increased cost may be offset by improved risk-adjusted returns.
Passive	Active	A buy and hold portfolio using only actively managed vehicles. High cost and unlikely to deliver optimal results as the aggregate risk characteristics of the funds are likely to change over time.
Active	Passive	Active management of passive vehicles can be carried out in three ways – a. Rebalancing – rebalance the portfolio when the allocations to each asset class deviate materially from the policy portfolio. For example, in the 50/50 portfolio if the Gilt exposure rises to 60% and the equity exposure is at 40%, then some of the Gilt fund would be sold and the proceeds reinvested into the equity fund to bring the allocation back in line. b. Tactical tilts – the portfolio is invested in passive vehicles, but the manager takes an active, tactical view on the exposures related to each asset class. For example, if the asset manager expects weakness in the UK equity market, they may reduce the exposure to equities and raise the exposure to Gilts.. c. Risk parity - This approach uses passive vehicles to obtain a specific risk-return profile for the portfolio. Often this approach can involve leverage and derivatives to obtain the desired exposures. However, this approach may be sub-optimal if there are actively managed vehicles that could provide better risk-adjusted returns than some of the passive vehicles in the portfolio.
Active	Passive and Active	Active management of a portfolio consisting of active and passive vehicles expands the choice to construct the most appropriate portfolio. However, while active management of this portfolio can provide benefits it may also incur costs through market timing and turnover.
Active	Active	The portfolio is composed of allocations to active management styles and is further actively managed through tactical and other tilts. Where capital is invested in illiquid assets, rebalancing may prove to be a challenge. The cost incurred in this approach may be unnecessarily high through investments in active vehicles investing in highly efficient markets.

Source: CFA UK

PORTFOLIO CONSTRUCTION

The aim of any portfolio should be to achieve the appropriate risk-adjusted return for the ultimate beneficiary. Hence, it is important to ensure that the selection of vehicles have the appropriate beta and alpha exposures and that these vehicles can be combined to maximise return for each unit of risk.

RISK-ADJUSTED RETURNS

TABLE 1 - ILLUSTRATION OF RISK-ADJUSTED RETURN

| UK equities	Active	Passive
Return	20.0%	20.0%
Total costs	1.0%	0.5%
Net return	19.0%	19.5%
Voltality	17.0%	20.0%
Risk adjusted return	1.12	0.98

Source: CFA UK

Portfolio construction aims to deliver the highest risk-adjusted return subject to the requirements and preferences of the asset owner. Table 1 demonstrates the insights provided by taking into account the risk-adjusted return. The asset owner in this example needs to select a UK equity fund and has short-listed an active fund and a passive fund. By looking purely on the performance net of costs there is a temptation to select the passive fund. However, this would overlook the better risk management of the active fund which has led to a 14% higher risk-adjusted return (using the Sharpe ratio with a risk-free rate of zero).

Of course, CFA UK acknowledges that there is more to risk than just the volatility of returns. Other risk factors would also be needed to be taken into account such as liquidity, leverage, counterparty, tracking error, capacity constraints etc

CORRELATION

One of the key principles of portfolio construction is how assets correlate with one another and how this helps the asset owner lower the risk-return trade-off. Assets that have low, zero or negative correlations are appealing because they can reduce the overall risk of the portfolio while improving the expected risk-adjusted return. This means that the asset owner (subject to preferences) should be agnostic about whether an investment vehicle is actively or passively managed. By way of illustration, we can use the efficient frontier to explain this concept.

Chart 1 shows an efficient frontier. The blue circle is the original portfolio. The asset owner is considering an additional investment for the portfolio to help with diversification. The current portfolio could consist of a combination of active and passive investments that have been selected based on how they meet the risk-adjusted return requirement of the asset owner. Presuming that there were no restrictions and this was an unconstrained mandate, the portfolio would have been constructed to maximise the expected return/risk trade-off. Hence, the same approach would be used when adding to the portfolio. Let's say that the asset owner has made their choice and this improves the efficiency (higher return for the same risk) of the portfolio by moving it to where the blue triangle is. The investment selected could be passively or actively managed. The main driver for selection would be the correlation with the current portfolio. The lower the correlation the more appealing the opportunity. How the potential investment is managed would be less of an issue unless the asset owner had very strong preferences.

CHART 1 – EFFICIENT FRONTIER
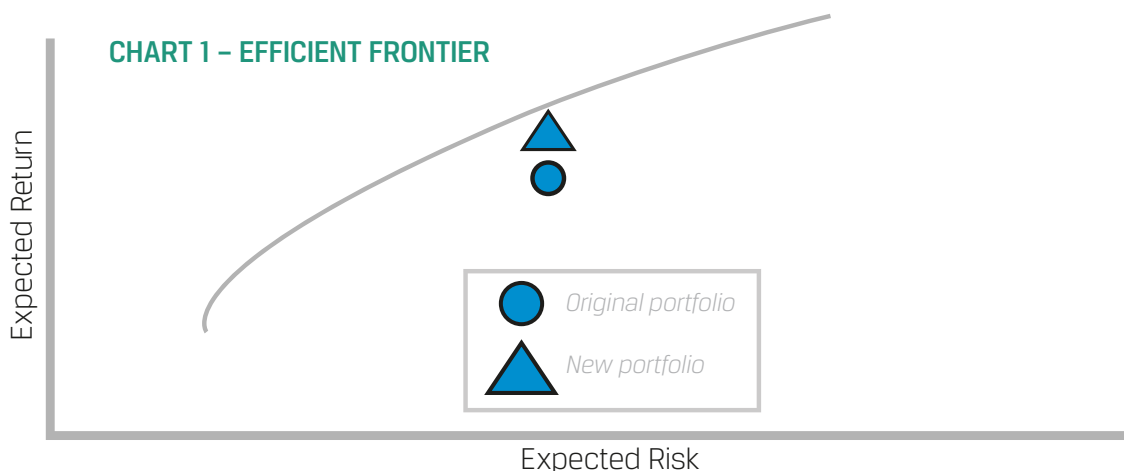
ACTIVE MANAGEMENT

The wealth of empirical evidence into the active vs passive debate is based on the theoretical view that markets are efficient. The only way to 'beat the market' is by taking on additional risk. The active vs passive debate has long been a discussion focussed on cost and performance. The third dimension missing from this discussion is risk. Asset management is as much about risk management as it is about performance generation. Risk-adjusted returns are what matter. Even if all schemes adopted a passive approach they would still be exposed to market risk and should achieve performance net of fees that was below the market return.

According to the CFA Institute's Research Foundation monograph 'Manager Selection'[1]

"Although the whole population of managers cannot be winners, some managers will beat the market or earn a positive alpha (that is, beat the relevant benchmark after an appropriate adjustment for risk)."

Table 2 demonstrates the ability to deliver alpha across different types of assets is variable. The more illiquid and esoteric the asset the greater the potential for active management to deliver excess risk-adjusted returns. However, the management fees charged by alternative investment managers are much higher than those charged by managers of liquid portfolios. Despite the challenges involved in selecting and investing with alternative managers; hedge funds, private equity, real estate, and commodities remain popular with many investors especially the endowments, despite the questions raised about how these assets generate alpha[2]. Some US endowments (assets US$ 1Bln+) have allocated the majority of their portfolios to these alternative asset classes[3].

TABLE 2 - EVIDENCE OF ALTERNATIVE INVESTMENT ALPHAS BASED ON RESULTS FROM FOUR RESEARCH STUDIES

	US Equity Mutual Funds	Funds-of-Funds Hedge Funds	Venture capital	Private Equity	Real Estate
Evidence of positive net alpha	Zero	Marginal	Mixed	Mixed	Marginal
Evidence of superior managers	Limited	Yes	Yes	Yes	Limited
Evidence of alpha persistence	Limited	Yes	Yes	Yes	Limited
Evidence of flows to positive-alpha managers	Yes	Yes	Yes	Yes	Yes

Notes: "Marginal" means there is some evidence of positive alpha but net alpha is not statistically significant at a high confidence level. "Mixed" means some evidence suggests positive net alpha but other evidence suggests only marginal alpha. "Limited" means there is evidence for a subset of the universe but that it is not necessarily sufficient for supporting profitable trading strategies.

Sources: The hedge funds study is Fung, Hsieh, Naik and Ramadorai (2008). The venture capital and private equity study is Kaplan and Schoar (2005). The real estate studies are Lin and Young (2004) and Bond and Mitchell (2010).

Source: 'Manager Selection'

[1]*Manager Selection , Research Foundation Publications December 2013, Vol. 2013, No. 4 by Scott D. Stewart, CFA http://www.cfapubs.org/toc/rf/2013/2013/4*
[2]*Do (Some) University Endowments Earn Alpha? Brad M. Barber, Guojun Wang Financial Analysts Journal, September/October 201,I Vol. 69I No. 5 Source: CFA Institute*
[3]*2013 NACUBO-Commonfund Study of Endowments® (NCSE) http://www.nacubo.org/Documents/2013NCSEPressReleaseFinal.pdf*

PASSIVE MANAGEMENT

As set out in 'Manager Selection' the goal of an index fund manager is to track a pre-specified index as closely as possible. The measure for replication success is called "tracking error", investors should also understand the indirect costs of achieving zero tracking error. The more assets that follow a benchmark, the greater the impact of benchmark effects from arbitrary add/deletes/changes. By trading at the benchmark effective date, an investment manager may reduce tracking error but may also reduce the absolute performance of the underlying index due to price reversions from short term index effects not related to fundamental valuation. The acceptable level of "tracking error" depends on both the relevant security market and the size, liquidity, and stability of the index. Index construction and maintenance rules also affect the ability of an index manager to succeed.

Sources of tracking error include –

» imperfect security weightings (for example, those attributable to delayed adjustment to constituent changes);

» cash build up (when the portfolio is not 100% invested because of income, corporate actions, contributions, or withdrawals);

» transaction costs (trading to handle constituent changes and cash flows);

» sampling error; and

» model error (because statistical models for building index portfolios that do not own every index constituent do not provide perfect forecasts).

Tracking equity indices with liquid constituents, like MSCI world, is easier than those with many constituent companies, illiquid securities, or fixed-income securities (because bonds typically do not trade in small lots and many issues that are not current may not trade at all). The latter may require "sampling" techniques because not all constituents can be purchased. Effective sampling techniques go beyond random selection and instead require the use of statistical models that measure risk exposures and help managers build portfolios that are forecast to exhibit low tracking error. In addition, passive exposure could be attained through the use of total return swaps which may be lower cost but add counterparty risk to the mix and even futures. Risk parity approaches to portfolio management use a combination of futures and passive funds to create customised risk/return profiles for portfolios.

TABLE 3 - RETURN CHARACTERISTICS OF ANNUALLY REBALANCED U.S. STRATEGIES FOR 1,000 STOCKS, 1964–2009

Strategy	Total Return	Volatility	Sharpe Ratio	Excess Return over Benchmark	Tracking Error	Information Ratio	One-Way Turnover
S&P 500[a]	9.46%	15.13%	0.26	–	–	–	6.69%
Heuristic -based weighting							
Equal weighting	11.78%	17.47%	0.36	2.31%	6.37%	0.36	22.64%
RCEW (k clusters)	10.91	14.84	0.36	1.45	4.98	0.29	25.43
Diversity weighting (p=0.76)	10.27	15.77	0.30	0.81	2.63	0.31	8.91
Fundamental weighting	11.60	15.38	0.39	2.14	4.50	0.47	13.60
Optimization-based weighting							
Minimum-variance	11.40%	11.87%	0.49	1.94%	8.08%	0.24	48.45%
Maximum diversification	11.99	14.11	0.45	2.52	7.06	0.36	56.02
Risk-efficient (λ=2)	12.46	16.54	0.42	3.00	6.29	0.48	34.19
[a]For the S&P 500, we report the turnover of a simulated U.S. cap-weighted index of the top 500 stocks rebalanced annually on 31 December. Actual S&P 500 turnover is generally lower owing to committee-based stock selection rules.							

The arrival of 'smart' beta has expanded the choice available to gain a rules based approach to asset classes. In the paper[4] by Chow et al they show how different approaches to weighting portfolios can bring about different outcomes. Alternative weights are used to construct the portfolio for example equal weights, risk weighted and using accounting metrics to weight the portfolio using business related factors e.g sales. In doing it has been shown that these alternative approaches to beta (or market return) can result in better risk-adjusted returns than their traditional passive counterparts.

Table 3 sets out these different approaches for global equities and U.S securities and compares these with the standard passive index. On a risk-adjusted basis most of the alternative approaches do outperform the traditional passive index and produce higher risk-adjusted returns (Sharpe ratios). However, are these new passive approaches more costly?

TABLE 4 - TRANSACTION COST ANALYSIS FOR GLOBAL AND US EQUITIES.

Global (1987–2009)						
Strategy	Excess Return over Benchmark	One-Way Turnover	Market Cap (US$ billions)	Avg. Bid-Ask Spread	Adj. Daily Volume (US$ millions)	Trading Costs[abc]
Cap-weighted benchmark	–	8.4%[d]	66.34	0.11%	464.91	0.10%[d]
Heuristic -based weighting						
Equal weighting	1.05%	21.8%	23.90	0.16%	174.96	0.31%
RCEW (k clusters)	3.20	32.3	37.47	0.17	189.12	0.69
Diversity weighting (p=0.76)	0.16	10.4	52.37	0.12	368.16	0.13
Fundamental weighting	3.54	14.9	59.14	0.14	397.81	0.28
Optimization-based weighting						
Minimum-variance	1.01%	52.0%	23.97	0.35%	128.43	0.49%
Maximum diversification	0.18	59.7	20.08	0.45	122.50	0.57
Risk-efficient (λ=2)	1.35	36.4	26.90	0.15	193.53	0.33
US (1964–2009)						
Cap-weighted benchmark	–	6.69%[e]	80.80	0.03%	735.40	0.03%[e]
Heuristic -based weighting						
Equal weighting	2.31%	22.6%	11.48	0.06%	132.49	0.22%
RCEW (k clusters)	1.45	25.4	37.14	0.04	312.04	0.12
Diversity weighting (p=0.76)	0.81	8.9	50.53	0.04	477.87	0.06
Fundamental weighting	2.14	13.6	66.26	0.05	617.47	0.13
Optimization-based weighting						
Minimum-variance	1.94%	48.4%	19.63	0.05%	136.37	0.43%
Maximum diversification	2.52	56.0	14.77	0.06	124.08	0.53
Risk-efficient (λ=2)	3.00	34.2	12.06	0.06	140.07	0.25

Note: Market Capitalization, bid-aqsk spread, and adjusted daily volume are estimated for rebalancing at the end of 2009.
[a]Trading costs are estimated with the model proposed by Keim and Madhaven (1997), which accounts for (1) different exchanges, (2) size of trade, (3) market capitalization, (4) price per share, and (5) style of investment. Portfolio size is fixed as US$100 million; style of investment is set as indexed.
[b]We modified the Keim–Madhaven model to reflect additional costs for trading on the London Stock Exchange (50 bps for selling) and the Hong Kong Stock Exchange (10bps for buying and selling).
[c]Trading costs include portfolio rebalancing only, not the costs of entering and exiting strategies.
[d]Turnover and trading costs are based on a simulated cap-weighted index of the top 1,000 stocks in the global developed market.
[e]Turnover and trading costs are based on a simulated cap-weighted index of the top 500 stocks in the U.S. market.

The authors then carried out a transaction cost analysis for a $100 million mandate and applied it to each type of portfolio. The summary of these results are set out in Table 4. Note that the trading cost estimates are naturally lowest for the market capitalisation portfolio and are economically higher for the other strategies. From the authors' estimations, however, it can been seen that the transaction costs for most strategies generally do not erode the entire return in excess of the cap-weighted benchmark.

[4] A Survey of Alternative Equity Index Strategies; Tzee-man Chow, Jason Hsu, Vitali Kalesnik, and Bryce Little Financial Analysts Journal, September/October 2011, Vol. 67, No. 5:37-57. http://www.cfapubs.org/doi/pdf/10.2469/faj.v67.n5.5

INSIGHTS INTO BETA AND ALPHA

TABLE 5 CHARACTERISTICS OF ALPHA AND BETA RISKS

	Beta Risk	Alpha Risk
Source of return	Positive expected premium earned by passive market exposure over time	Return from actively managing exposures to individual securities or timing of market exposure
Skill required	Low	High – competing with other active managers
Confidence in earning the expected return	High over long periods, but subject to short-term volatility	Low – difficult to identify exceptional managerial talent in advance
Cost	Low	High – have to pay for managerial talent and trading costs
Allocation of return among investors	All investors simultaneously realise the same return for the same market exposure	Some investors earn active returns at the expense of others
Shape of the return distribution	Can have fat tails but is somewhat symmetric	Can be quite skewed (asymmetric distribution), with significant fat-tail risk

To provide further insight into combining active and passive strategies one has to understand the risk factors related to beta and alpha. The characteristics of alpha and beta risk are set out in the CFA Institute Research Foundation monograph 'Investing Separately in Alpha and Beta'[5]. Table 5 sets out the building blocks that can be used to combine beta and alpha exposures.

CHART 2 – DECOMPOSITION OF RISK AND RETURN

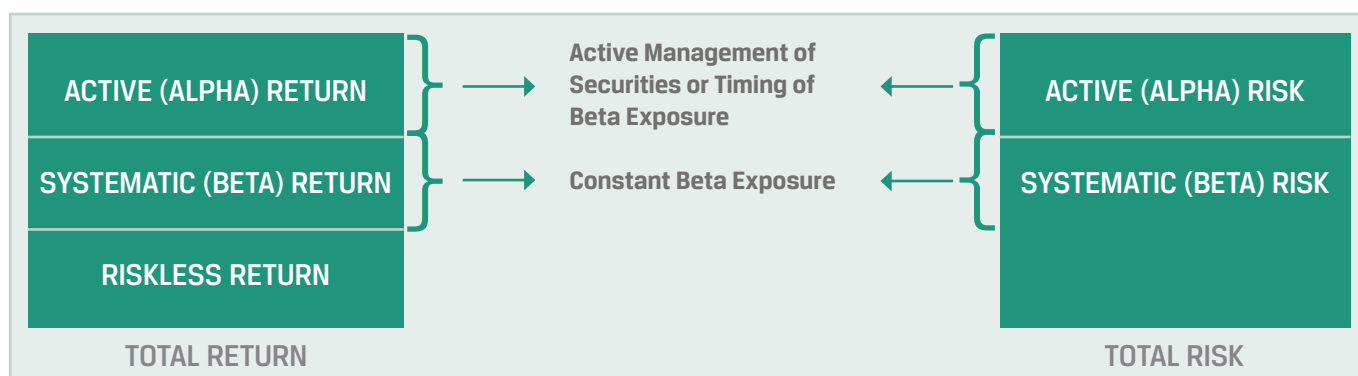| ACTIVE (ALPHA) RETURN | Active Management of Securities or Timing of Beta Exposure | ACTIVE (ALPHA) RISK |
SYSTEMATIC (BETA) RETURN	Constant Beta Exposure	SYSTEMATIC (BETA) RISK
RISKLESS RETURN		
TOTAL RETURN		TOTAL RISK

Chart 2 demonstrates how the beta and alpha risks can be further decomposed in terms of risk and return. In essence, the return and risk profile of the portfolio can be categorised as exposures to a set of beta and alpha factors. These insights can then be used to construct the appropriate portfolio. In fact, the number of combinations available expands when one takes into account the availability of contingent capital. The distinction between actual capital and contingent capital is demonstrated in Table 6.

TABLE 6 - CAPITAL REQUIREMENTS FOR ALPHA AND BETA

	Committed Capital	Contingent Capital
Beta exposure: risk and return from exposure to market factors	• Index funds • ETFs • Structured products	• Futures • Swaps
Alpha exposure: risk and return from active security selection or tactical beta timing	• Security selection • Tactical beta allocation	•Tactical beta allocation

Table 7 sets out the estimated costs for the different ways by which one can gain exposure to equity beta (S&P 500) ranging from holding the equities directly to using ETFs, futures and swaps. The use of contingent capital is slightly more expensive, but there does not appear to be a material difference.

TABLE 7 - TRANSACTION AND HOLDING COSTS FOR SIX ALTERNATIVES FOR S&P 500 EXPOSURE (IN BASIS POINTS)

	ETF			Futures		
	Stocks	**SPDR**	**iShares**	**Regular**	**e-Mini**	**Swap**
Commission	14.6	4.3	4.3	0.3	1.4	10.0
Market impact	30.8	30.8	30.8	75.0	30.0	30.8
Transaction costs	45.4	35.1	35.1	75.3	31.4	40.8
Securities rebalancing	2.2					
ETF management fee		9.4	9.0			
Futures basis				-13.7	-9.6	
Swap rate spread						5.0
Holding cost	2.2	9.4	9.0	-13.7	-9.6	5.0
Total long	47.6	44.5	44.1	61.6	21.8	45.8
Incremental short	30.0	16.2	25.6	30.0	30.0	8.0
Total short	77.6	60.7	69.7	91.6	51.8	53.8

Note: Estimates are based on $1.5 billion one-year exposure in April 2008.

To illustrate how we can use beta and alpha we provide some examples.

Example 1 Investor seeks an expected return of 8%

PROPOSITION 1 - 50% ACTIVE FUND PLUS 50% INVESTMENT IN CASH

	Expected Return	Standard Deviation	Committed Capital Allocation	Market Exposure
Actively managed equity fund	12.0%	13.0%	50.0%	50.0%
Cash	4.0	0.0	50.0	0.0
Total portfolio	8.0%	6.5%	100.0%	50.0%
Sharpe ratio	0.62			

In proposition 1, the investor achieves their requirement with an expected Sharpe ratio of 0.62. Could the investor do better?

PROPOSITION 2 – FUTURES HEDGE FOR 90% ALLOCATION TO EQUITY FUND, 10% CASH ALLOCATION

	Expected Return	Standard Deviation	Committed Capital Allocation	Market Exposure
Actively managed equity fund	12.0%	13.0%	90.0%	90.0%
Index futures	5.0	12.0	0.0	-60.0
Cash	4.0	0.0	10.0	0.0
Total portfolio	8.2%	5.8%	100.0%	30.0%
Sharpe ratio	0.73			
Hedge ratio	0.67			

In proposition 2, the investor could invest 90% of their capital in the active equity fund, 10% invested in cash and then take a short position in equity index futures to hedge out the unwanted beta exposure in the active equity fund. In doing so, the investor achieves a higher expected risk-adjusted return (Sharpe ratio 0.73) and a lower equity market exposure of 30%. Could the same market exposure be achieved in a different way?

PROPOSITION 3 - 90% ALPHA FUND (EQUITY MARKET NEUTRAL); 30% BETA FUND; AND 10% ALLOCATION TO A BETA FUND

	Expected Return	Standard Deviation	Committed Capital Allocation	Market Exposure
Alpha fund	7.0%	5.0%	90.0%	0.0%
Beta fund	9.0	12.0	30.0	30.0
Cash	4.0	0.0	-20.0	0.0
Total portfolio	8.2%	5.8%	100.0%	30.0%
Sharpe ratio	0.73			

Proposition 3 demonstrates that the same market exposure and Sharpe ratio could have been achieved by investing 90% of the capital into an equity market neutral fund; 30% in a fund that tracks the market index (one would need to factor in the features of the beta vehicle used, e.g tracker fund, ETF etc) and borrow 20% cash to fund the portfolio and replicate the futures hedge set out in proposition 2. Proposition 3 also highlights how the risk of this portfolio now includes short positions and leverage; risks which may be imperfectly captured in the Sharpe ratio. In addition, one would also need to look at the costs associated with each of the three propositions to see which provided the most appropriate net benefits to the ultimate beneficiary.

We can extend these principles to helping clients ensure that they do not pay active fees for beta performance. As we can see from the example so far the active manager generates better risk-adjusted returns than the passive portfolio even though the headline performance is below the passive equity fund.

Example 2 – a tale of 4 active equity funds[6]

	Fund A	Fund B	Fund C	Fund D
Market Beta	1.03	0.73	1.19	0.83
Alpha	0.41%	1.84%	-0.26%	3.91%
Active Risk	3.56%	6.95%	8.39%	11.09%
Information ratio	0.12	0.27	-0.03	0.35

As example 2 demonstrates Fund B has the lowest beta and produced the highest alpha. However, one would need to interrogate this further to ensure that the alpha generated was not accounted for by other factors.

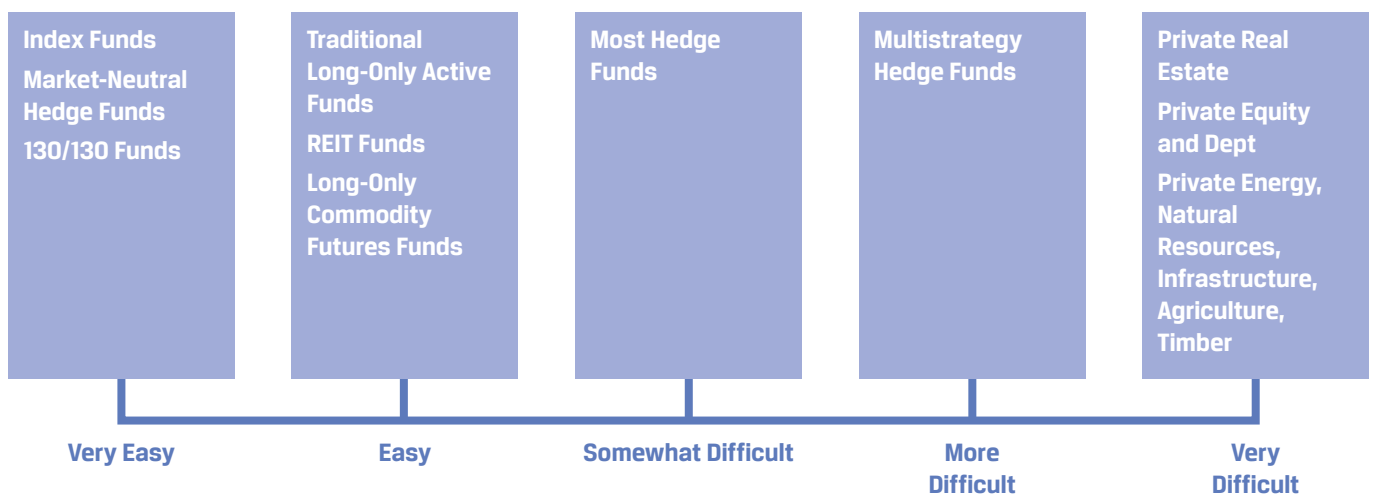|	Fund A	Fund B	Fund C	Fund D
Market	0.99	0.89	1.05	0.86
Small size	-0.02	-0.09	0.12	0.76
Value	-0.10	0.50	-0.39	0.08
Alpha	0.48	0.07%	0.53%	2.00%
Active risk	3.20%	2.80%	5.66%	4.44%
Information ratio	0.15	0.02	0.09	0.45

As Panel B demonstrates once additional factors are taken into account the alpha of Fund B reduces to 7bps from the original 184bps. Hence one could have obtained the same factor exposures using passive funds that provide exposures to these factors more cost effectively. Fund D is a small-cap fund and so using the large-cap market proxy in Panel A is not meaningful. However, by adding the additional factors there is also a reduction alpha and active risk. Hence, one could use the approach outlined above to focus on the alpha of Fund D and hedge out the relevant beta factors that are represented elsewhere in the asset owner's portfolio.

WHAT ABOUT OTHER ASSET CLASSES AND IMPLEMENTATION?

The same approach can be taken with other asset classes although obtaining the appropriate beta exposures (as demonstrated by Chart 3) may be more challenging with more illiquid assets like real estate, private equity and commodities. Hedge funds as well as alternatives also provide a further challenge in identifying the appropriate beta given the potential for the use of leverage. For example an equity hedge fund that employs leverage may have a higher sensitivity to the market than a passive equity fund. Similarly, several authors have indicated that based on their research the beta of private equity should be about 2[7]. Hence, when assessing the beta factor exposures required for the asset owner, the higher potential betas of alternatives and hedge funds would need to be taken into account when aiming for the required beta exposures.

CHART 3 CONTINUUM OF DIFFICULTY IN SEPARATING ALPHA AND BETA

Index Funds Market-Neutral Hedge Funds 130/130 Funds	Traditional Long-Only Active Funds REIT Funds Long-Only Commodity Futures Funds	Most Hedge Funds	Multistrategy Hedge Funds	Private Real Estate Private Equity and Dept Private Energy, Natural Resources, Infrastructure, Agriculture, Timber
Very Easy	Easy	Somewhat Difficult	More Difficult	Very Difficult

Source: 'Investing Separately in Alpha and Beta'

To provide additional insights the monograph does present some useful data and divides this into two sub-periods 1988-1997 and 1998-2007 (notably before the 2008 financial crisis). Tables 8(a) and 8(b) set out how each asset class relates to a variety of beta factors. More important is the manner by which the risk, return and factor weightings have changed over time. The Sharpe ratio for real estate (NCREIF) increased from -0.18 to 4.49 while Private Equity (CAPE) decreased to 1.00 from 1.84. It is also noticeable how the returns for some asset classes became more correlated over time. It is noticeable with Private Equity which doubled its correlation to equity market factors. Implementing a portfolio to achieve the appropriate beta and alpha exposures is not without challenge (see Table 9). However, investors can gain valuable insights into the drivers of returns and how these returns can be accessed efficiently while being able to customise the risk profile of the portfolio.

[7] Jiang, Yindeng and Saenz, Joseph F, Estimating Private Equity Market Beta Using Cash Flows: A Cross-Sectional Regression of Fund-Market Paired Internal Rates of Return (July 1, 2014). Available at SSRN: http://ssrn.com/abstract=2431835

TABLE 8(A) - BROAD FACTOR ANNUALIZED RETURNS AND RISK, 1988–1997

	S&P500	R2000	EAFEH	LAFI	GSCI	NCREIF	CAPE	FX
Average	12.15%	9.60%	3.50%	3.65%	7.83%	-0.60%	10.70%	-1.11%
Std.dev.	10.43%	17.11%	15.94%	4.53%	13.24%	3.37%	5.81%	9.60%
Sharpe ratio	1.16	0.56	0.22	0.81	0.59	-0.18	1.84	-0.12
Correlation								
S&P500	1.00	0.79	0.68	0.49	0.19	0.02	0.34	-0.18
R2000	0.79	1.00	0.69	0.27	0.20	-0.03	0.33	-0.39
EAFEH	0.68	0.69	1.00	0.16	0.13	0.16	0.30	-0.29
LAFI	0.49	0.27	0.16	1.00	-0.11	-0.23	0.16	0.23
GSCI	0.19	0.20	0.13	-0.11	1.00	-0.01	0.08	-0.21
NCREIF	0.02	-0.03	0.16	-0.23	-0.01	1.00	0.27	-0.20
CAPE	0.34	0.33	0.30	0.16	0.08	0.27	1.00	-0.24
FX	-0.18	-0.39	-0.29	0.23	-0.21	-0.20	-0.24	1.00

Notes: S&P50 is excess return on the S&P 500 Large-Cap Domestic Equity Index. R2000 is excess return on the Russell 2000 Small-Cap Domestic Equity Index. EAFEH is excess return on the currency-hedged MSCI EAFE International Equity Index. LAFI is excess return on the Lehman Aggregate U.S. Domestic Fixed-Income Index. GSCI is excess return on the S&P/Goldman Sachs Commodity Index. NCREIF is excess return on the NCREIF Real Estate Index. (NCREIF is the National Council of Real Estate Investment Fiduciaries.) CAPE is excess return on the Cambridge Associates Private Equity Index. FX is return on the EAFE minus the EAFEH return.

TABLE 8 (B) BROAD FACTOR ANNUALIZED RETURNS AND RISK, 1998-2007

	S&P500	R2000	EAFEH	LAFI	GSCI	NCREIF	CAPE	FX
Average	3.66%	5.81%	5.38%	2.40%	4.42%	8.85%	11.15%	1.52%
Std.dev.	16.70%	21.60%	18.18%	3.46%	23.31%	2.02%	11.17%	8.04%
Sharpe ratio	0.22	0.27	0.30	0.70	0.19	4.39	1.00	0.19
Correlation								
S&P500	1.00	0.88	0.91	-0.52	0.10	0.25	0.73	-0.03
R2000	0.88	1.00	0.87	-0.49	0.31	0.11	0.69	-0.05
EAFEH	0.91	0.87	1.00	-0.61	0.18	0.33	0.77	-0.20
LAFI	-0.52	-0.49	-0.61	1.00	-0.01	-0.19	-0.50	0.27
GSCI	0.10	0.31	0.18	-0.01	1.00	0.03	0.16	-0.24
NCREIF	0.25	0.11	0.33	-0.19	0.03	1.00	0.53	0.03
CAPE	0.73	0.69	0.77	-0.50	0.16	0.53	1.00	-0.02
FX	-0.03	-0.05	-0.20	0.27	-0.24	-0.03	-0.02	1.00

TABLE 9 CHECKLIST OF IMPLEMENTATION ISSUES

PORTFOLIO STRUCTURE

1. Diversification and Risk allocation

2. Degree of true alpha-beta separation

3. Initial funding; committed vs contingent capital

4. Separate portfolio vs commingled fund

5. Valuation and pricing procedures

6. Custody of funds and accounting audits

7. Use of leverage

8. Portfolio constraints (e.g., regulatory, legal, investor imposed)

ALPHA MANAGEMENT

1. Identified sources of alpha

2. Alpha measurement: pure alpha vs alpha and partial beta

3. Finding managers with alpha-generating skill
    a. Reasonable value-added strategies
    b. Costs (e.g., management fees, trading and administrative costs)
    c. Capacity constraints
    d. Alignment of investor and manager incentives
    e. Historical performance attribution

4. Counterparty risk

5. Performance measurement and attribution

BETA MANAGEMENT

1. Identified sources of beta

2. Beta measurement

3. Choice of implementation vehicles
    a. Tracking error
    b. Costs
    c. Capacity constraints
    d. Source of funding

4. Counterparty risk

5. Performance measurement and attribution

LIQUIDITY MANAGEMENT

1. Initial funding: committed vs contingent capital

2. Settlement of contingent-capital cash flows

3. Spending needs and deferred capital calls

4. Rebalancing

5. Lockup provisions

CONCLUSION

The debate about active and passive investing requires reshaping as the current focus is on a binary choice between active and passive rather than how these approaches can be combined to construct the most appropriate portfolio. When constructing portfolios, the key objective is the risk-adjusted return (net of fees). How this is achieved relies on a variety of factors, all of which are determined by the asset owner's preferences and requirements. The aim should be to use the most appropriate combination of assets and approaches to align with the client's requirements.

As this paper demonstrates, both the passive and active approaches to portfolio construction and management are varied and so provide a range of possible combinations to the client. A binary approach that focuses on an active or passive approach is likely to limit the choice available to the client to meet their objectives.

Chart 2 demonstrated how the beta and alpha risks can be further decomposed in terms of risk and return. In essence, the return and risk profile of the portfolio can be categorised as exposures to a set of beta and alpha factors. These insights can then be used to construct the appropriate portfolio for the client and so help them achieve the expected risk-adjusted return.

However, while we should be open about how to construct the most appropriate portfolio for our clients, it is essential that we understand the implications of the factors that can affect implementation (see Table 9).