
ACTIVE INVESTING AS A NEGATIVE SUM GAME: A CRITICAL REVIEW

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The literature on whether active management adds value is examined through the prism of the proposition by Sharpe (1991) that active investing is a negative sum game after costs. Focal points include how active fund research does not directly test Sharpe's proposition and seems inconsistent with it acting as a constraint, and the gaps that may leave room for active managers to outperform. It is argued that greater attention needs to be paid to the importance of investor circumstances and market conditions for the active-passive choice, in particular the fee paid, investor objectives and asset category.



1 Introduction

Sharpe (1991) puts forward the proposition that active investing must be a losing pursuit in aggregate, as it amounts to a zero-sum game in gross terms and hence must be a negative sum game after costs. This review takes a critical look at the underlying concepts and assumptions behind Sharpe's proposition, and links it to the issue of whether it is worthwhile for investors to consider using actively managed funds. Related academic research on active management is selectively highlighted, with a view to establishing support for the concepts raised rather than providing

a comprehensive coverage of what is a massive body of literature. Basic modelling indicates how active funds might extract active returns from other active investors and passive funds that track an index. This paper complements Pederesen (2018), who challenges Sharpe's arithmetic as failing to account for dynamic adjustments that stem from changes in the market universe.

The broad conclusion is that Sharpe's proposition is not water-tight upon closer examination, and certainly should not be received as gospel. In particular, it is insufficient to sustain the general conclusion that indexed funds should necessarily be favoured over active management. Rather, the evidence indicates that whether active or passive management is likely to deliver a better outcome will vary with the circumstances of the investor and the asset category being considered. That

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is, sweeping generalizations on the relative efficacy of active management are not supported. The main message is that ‘it depends’.

Framing the discussion around Sharpe’s proposition implies adopting his definition of active and passive investing. Sharpe (1991, p. 7) states: ‘A passive investor always holds every security from the market, with each represented in the same manner as in the market’, and ‘An active investor is one who is not passive.’ Sharpe’s definition effectively implies that passive investors hold a capitalization-weighted investment in the market of interest, while active investors deviate from cap-weights in some way. Enhanced indexed funds and mechanical processes such as smart beta or factor-driven strategies are thus active investors under this definition. In practice there are degrees of active and passive investing, with the position on the spectrum depending on the extent of deviation from cap-weights. Furthermore, much of the academic literature has used factor models as benchmarks for active management, which do not equate with Sharpe’s definition of passive investing. The slippery nature of the definition of ‘active’ and how the literature has evaluated active funds thus becomes an issue that arises within the context of this review.

Some background on the current state of the discussion over active management may be useful for context. The case for active versus passive management is sometimes discussed or reported as an adversarial debate, and portrayed as a ubiquitous either/or choice. The mantra that ‘active management adds no value’ seems to have been embraced in some quarters, and is helping to fuel the current switch to passive management. A key point to emerge from this review is that approaching active versus passive as an either/or choice is not only unhelpful, but also does not accord with the broader body of evidence. The discussion would be much healthier if it was

framed around seeing the choice between active and passive as a conditional one, including giving consideration to whether both might be used in tandem. Fortunately, many practitioners start from the position that active and passive are potentially valid choices, with some investors using both within their portfolios, e.g. ‘core-satellite’ approaches. To this effect, Section 10 recounts a framework that could assist in identifying situations where active management may form part of the mix.

2 Sharpe’s Proposition

Sharpe’s logic is enticing. He calls his paper ‘*the arithmetic of active management*’, and presents a case that active investing must be a negative sum game as a mathematical truism. His argument is that, as all investors hold the market in aggregate, then active investing must fail on average as a matter of an adding-up constraint. Passive investors who hold the market will earn the gross market return pre-costs. The remainder are active investors who each deviate from market weights in some way, but in aggregate must also hold the market for the holdings to add up. Thus active investors also receive the gross market return in aggregate, with any one active investor’s gain being another active investor’s loss. This also means active investors must therefore do worse than passive investors in net returns, as they are incurring greater costs related to aspects such as research, fees and trading. Active investing is thus a zero-sum game in gross terms, and a negative sum game in net terms.

French (2008) backed up Sharpe in his Presidential Address to the American Finance Association. He presented an estimate of 67 basis points (bps) as the aggregate cost that investors incurred in pursuing active returns in US equities over the period 1980–2006. His calculations incorporate all fees and expenses for mutual funds, hedge

fund fees, the investment management costs of institutional investors, and an estimate of trading costs; and deduct the estimated cost of investing passively. The implication is that this is a big cost to pay in the hope of outperforming the market.

French acknowledges that active investment may provide a social benefit through making the market more efficient. Even so, active investors are paying the price for this social benefit without reaping any private gain. French estimates that the ‘capitalized’ cost of providing this ‘service’ amounts to about 10% of the total market capitalization. While greater market efficiency may raise returns for all investors, he argues that active management remains a negative sum game nevertheless. Essentially passive investors are free-riders on any positive externalities generated by active managers through their efforts to outperform.

The implications of Sharpe’s proposition are worth pointing out as background for interpreting the evidence from the academic research. A key test of Sharpe’s proposition that active investing amounts to a zero-sum game at the gross return level and a negative sum game at the net return level is whether the *aggregate (i.e. asset-weighted) return earned by active investors relative to the market is zero before costs*. If this were found to be the case, then it naturally follows that the net active return will be negative. As we will see, there is a fair amount of dissonance between this condition and the way that most academic research is conducted. In particular, it is difficult to observe the returns earned by all active investors. Furthermore, Sharpe’s proposition does not imply that actively managed funds cannot outperform, but rather that other active investors must underperform for them to do so. This nuance leaves open the door for active managers to outperform where they possess some competitive advantage over other

active investors. These matters are recognised within Sharpe (1991), and will be addressed in more depth later.

3 A Basic Model

A basic model¹ is presented for framing before moving on to address the counterarguments and evidence with respect to Sharpe’s proposition. The model focuses on investor returns within a market that includes actively managed funds, other active investors and passive investors who track an index, all of who may interact. The modelling commences by describing Sharpe’s proposition in the form of some simple equations. It then characterizes how investor returns may be impacted by various aspects that will be discussed as the paper progresses. These include the situation where the index does not capture the entire market; the co-existence of active funds with other active investors who underperform; how trading by index investors may create opportunities for active investors; and the gap between Sharpe’s proposition and factor-based performance evaluation methods. The model is inspired by, and draws on, Madhavan and Morillo (2018).

Consider returns for a market (identified by ‘ M ’), denoted as R_M . The market is populated by index investors (identified by ‘ I ’) and active investors (identified by ‘ A ’). Index investors hold w_I of the market and earn a return of R_I . Active investors hold $(1 - w_I)$ of the market and earn a return of R_A . The return on the market over time t is the weighted sum of the returns earned by both types of investors:

$$R_{M,t} = w_{I,t}R_{I,t} + (1 - w_{I,t})R_{A,t} \quad (1)$$

Assume that index investors hold the market index, which is in turn a complete representation of the market so that R_I equals R_M . Equation (2)

substitutes $R_{M,t}$ for $R_{I,t}$ and solves to demonstrate that $R_{A,t}$ must also equal $R_{M,t}$. This is Sharpe's proposition, which holds in aggregate regardless of whether various active investors might hold the securities comprising the market universe in different combinations.

$$R_{M,t} = w_{I,t}R_{M,t} + (1 - w_{I,t})R_{A,t} \quad (2a)$$

$$(1 - w_{I,t})R_{M,t} = (1 - w_{I,t})R_{A,t} \quad (2b)$$

$$R_{A,t} = R_{M,t} \quad (2c)$$

The assumption that the index completely describes that the market need not hold in practice. Consider a situation where the market index covers $x\%$ of the market, with $(1 - x)$ being 'off-index' securities (identified by 'OI') that are not owned by index investors and hence held by active investors. Equation (3) describes returns for the market, index investors and active investors in these circumstances (Equations (3a), (3b) and (3c), respectively), as well as the return difference between active and index investors (Equation (3d)). Derivation of Equation (3c) uses the fact that active investor holdings comprise the index securities not owned by index investors (i.e. $x_t(1 - w_{I,t})$) plus all off-index securities (amounting to $(1 - x_t)$), thus providing the weightings for each component of $x_t(1 - w_{I,t})/[x_t(1 - w_I) + (1 - x_t)]$ and $(1 - x_t)/[x_t(1 - w_I) + (1 - x_t)]$, respectively.

$$R_{M,t} = x_tR_{I,t} + (1 - x_t)R_{OI,t} \quad (3a)$$

$$R_{I,t} = \frac{R_{M,t} - (1 - x_t)R_{OI,t}}{x_t} \quad (3b)$$

$$R_{A,t} = \frac{(1 - w_{I,t})R_{M,t} + [(1 - x_t) - (1 - x_t)(1 - w_{I,t})]R_{OI,t}}{1 - xw_{I,t}} \quad (3c)$$

$$R_{A,t} - R_{I,t} = \frac{\frac{(1-x_t)}{x_t}R_{OI,t} + \frac{(x_t-1)}{x_t}R_{M,t}}{1 - xw_{I,t}} \quad (3d)$$

Equation (3) highlights the need to take care in interpreting the meaning of the 'market' under Sharpe's proposition. It identifies that one straightforward way in which Sharpe's proposition can break down is the possibility that passive index investors may not earn the market return when the index is an incomplete representation of the market. To gain a sense of the magnitudes involved, assume that the index covers 90% of the market ($x = 10\%$), index investors hold 25% of the market ($w_I = 25\%$) and off-benchmark assets outperform the market by 1% ($R_{OI,t} - R_{M,t} = 1\%$). The latter might be justified if there was a return premium available on assets that are not included in the index.² Under these assumptions, the index investor underperforms the broader market by -0.11% . Meanwhile, the active investor outperforms the index and hence passive investor by $+0.14\%$, and the overall market by $+0.03\%$

A further possibility is that certain active investors may generate excess returns at the expense of other active investors, as openly recognized by Sharpe. This possibility is particularly relevant when the concern is whether to invest via actively managed funds, given that they represent a subclass of active investors that might possess some advantages over other active investors. This possibility is also relevant for interpreting the academic research, which mostly focuses on the performance of active funds in isolation rather than active investors overall. To illustrate, assume that the holdings of active investors comprise active funds (identified by 'AF') at a weighting of w_{AF} who earn R_{AF} and other active investors ('AO') at a weighting of w_{OA} who earn R_{OA} . Furthermore, assume that the index is a complete representation of the market so that $R_I = R_M$. This situation is described by Equation (4a) and

leads to Equation (4b), which is the same as Equation (11) in Madhavan and Morillo (2018):

$$\begin{aligned}
 R_{M,t} &= w_{I,t}R_{M,t} \\
 &+ (1 - w_{I,t})(w_{AF,t}R_{AF,t} \\
 &+ w_{OA,t}R_{OA,t}) \quad (4a) \\
 (R_{AF,t} - R_{M,t}) &= \frac{w_{OA,t}}{w_{AF,t}}(R_{OA,t} - R_{M,t}) \quad (4b)
 \end{aligned}$$

Although Equation (4) embeds the assumption that Sharpe's proposition holds, active funds may still generate above-market returns depending on the relative weighting versus other active investors and where the latter underperforms the market. To provide a sense of the magnitude, assume that private investors underperform the market by 1% per annum, and comprise 20% of all active investors (implying that $\frac{w_{OA,t}}{w_{AF,t}} = 0.20/0.80 = 0.25$). Equation (4b) indicates that this might support outperformance by active funds of 0.25% per annum. This analysis provides context for interpreting the evidence on the performance of active funds, indicating how outperformance in gross terms by active funds could arise at the expense of other active investors as a consequence of aspects such as superior information, differing investor objectives or perhaps behavioural effects.

Sharpe's assumption that index investors exactly hold the index and hence the market at all points of time ignores the dynamic nature of investment markets, and does not allow for the fact that index investors need to trade with active investors in response to developments such as fund inflows or index changes. A two-period model of index rebalancing is presented to illustrate how the trading dynamics required under index investing may open up avenues for active investors to outperform passive investors. The reader might refer

to the Appendix of Pedersen (2018) for a more developed model.

The model assumes that the market index does not include all securities in the market, and allows for the possibility that index investors may not hold all stocks in the index. Thus the market index and index investors are separated here and identified as 'MI' and 'II', respectively. The index is rebalanced at the beginning of period t , requiring index investors to purchase additions equal to y_A of the index and sell deletions equal to y_D of the index. These rebalancing trades occur at the end of period t and give rise to price impact of PI_A and PI_D , respectively. A portion T of the price impact is temporary and is subsequently unwound by prices reverting in period $t + 1$. All securities earn the broader market return (R_M) apart from any adjustment associated with PI_A and PI_D , i.e. price impact is the only source of excess return. Active investors initially own the securities that the index investors need to trade, and take the other side when the trades occur. The three equation sets below describe returns to the market index (R_{MI}), index investors (R_{II}), active investors (R_A); and the return difference between active investors and index investors. Equation (5) relates to period t , Equation (6) to period $t + 1$, and Equation (7) sums both periods.

Period t:

$$\begin{aligned}
 R_{MI,t} &= (1 - y_A)R_{M,t} + y_A(R_{M,t} + PI_{A,t}) \\
 &= R_{M,t} + y_A PI_{A,t} \quad (5a)
 \end{aligned}$$

$$\begin{aligned}
 R_{II,t} &= (1 - y_D)R_{M,t} + y_D(R_{M,t} - PI_{D,t}) \\
 &= R_{M,t} - y_D PI_{D,t} \quad (5b)
 \end{aligned}$$

$$\begin{aligned}
 R_{A,t} &= (1 - y_A - y_D)R_{M,t} + y_A(R_{M,t} \\
 &+ PI_{A,t}) + y_D(R_{M,t} - PI_{D,t}) \\
 &= R_{M,t} + y_A PI_{A,t} - y_D PI_{D,t} \quad (5c)
 \end{aligned}$$

$$R_{A,t} - R_{II,t} = y_A PI_{A,t} \quad (5d)$$

Period $t + 1$:

$$\begin{aligned} R_{MI,t+1} &= (1 - y_A)R_{M,t+1} \\ &\quad + y_A(R_{M,t+1} - T \cdot PI_{A,t}) \\ &= R_{M,t} - y_A T \cdot PI_{A,t} \end{aligned} \quad (6a)$$

$$R_{II,t+1} = R_{MI,t+1} \quad (6b)$$

$$\begin{aligned} R_{A,t+1} &= (1 - 2y_D)R_{M,t} \\ &\quad + 2y_D(R_{M,t} + T \cdot PI_{D,t}) \\ &= R_{M,t} + 2y_D T \cdot PI_{D,t} \end{aligned} \quad (6c)$$

$$\begin{aligned} R_{A,t+1} - R_{II,t+1} \\ &= 2y_D T \cdot PI_{D,t} + y_A T \cdot PI_{A,t} \end{aligned} \quad (6d)$$

Period t and $t + 1$ combined:

$$\begin{aligned} R_{MI,t} + R_{M,t+1} &= R_{M,t} + R_{M,t+1} \\ &\quad + (1 - T)y_A \cdot PI_{A,t} \end{aligned} \quad (7a)$$

$$\begin{aligned} R_{II,t} + R_{II,t+1} &= R_{M,t} + R_{M,t+1} \\ &\quad - y_D PI_{D,t} - y_A T \cdot PI_{A,t} \end{aligned} \quad (7b)$$

$$\begin{aligned} R_{A,t} + R_{A,t+1} &= R_{M,t} + R_{M,t+1} \\ &\quad + y_A PI_{A,t} + (2T - 1)y_D \cdot PI_{D,t} \end{aligned} \quad (7c)$$

$$\begin{aligned} (R_{A,t} + R_{A,t+1}) - (R_{II,t} + R_{II,t+1}) \\ &= (1 + T)y_A \cdot PI_{A,t} + 2Ty_D \cdot PI_{D,t} \end{aligned} \quad (7d)$$

The two terms appearing in Equation (7d) highlight the potential sources of outperformance by active investors over index investors over the two periods. The first term reflects the extent to which active investors are able to: (a) capture PI_A during period t for additions the index, which occurs prior to index investors completing their buy-side rebalancing trades; and (b) then avoid any reversion in prices during period $t + 1$ that happens after the index investors have bought.

The second term represents any rebound in prices during period $t + 1$ for securities that have been excluded from the index. Active investors pick up this effect two times relative to index investors, as they not only continue to hold their original securities, but also purchase those sold by index investors thus doubling their exposure when the rebound occurs. This model highlights the point that Sharpe's proposition may break down when the need for passive investors to trade is brought into consideration. Section 7 will discuss the role of dynamics in more depth, and cite evidence on the magnitude of the related effects.

Finally, Sharpe's proposition is framed in terms of excess return versus the market. It is worth comparing this with the performance evaluation methods used in much of the academic literature, which typically apply some form of factor model. Equation (8) defines excess return for an active fund (XR_{AF}) in a manner that is consistent with Sharpe's proposition. Equation (9) presents an application of the widely used model of Fama–French (1993), whereby alpha (α) is calculated by adjusting active fund returns for factor return contributions estimated as the product of returns to the market (R_M), size (SMB) and value (HML) factors multiplied by the respective factor loadings (β, s, h). Equation (10) reports the difference between the two equations. It is clear that the difference between XR and α is attributable to the extent to which active funds returns arise from factor exposures. This general point holds for any factor model. The main message is that fund alpha as often reported in the literature does not represent an equivalent concept of value-add to that described by Sharpe. Extra care thus needs to be taken in interpreting academic results as evidence on Sharpe's proposition.

Excess return:

$$XR_{AF,t} = R_{AF,t} - R_{M,t} \quad (8)$$

Fama–French model:

$$\begin{aligned} \alpha_{AF,t} = & R_{AF,t} - \beta_{AF,t-1}(R_{M,t} - R_{f,t}) \\ & - s_{AF,t-1}SMB_t - h_{AF,t-1}HML_t \end{aligned} \quad (9)$$

Difference:

$$\begin{aligned} XR_{AF,t} - \alpha_{AF,t} \\ = & (\beta_{AF,t-1} - 1)R_{M,t} - \beta_{AF,t-1}R_{f,t} \\ & + s_{AF,t-1}SMB_t + h_{AF,t-1}HML_t \end{aligned} \quad (10)$$

Against the background of the basic modelling presented above, the discussion now shifts to arguments on the efficacy of active management and examination of the academic evidence.

4 Grossman and Stiglitz Offer a Different Perspective

Sharpe’s proposition grates against an alternative perspective that was advocated earlier by Grossman and Stiglitz (1980). Grossman and Stiglitz (GS) describe an equilibrium where markets are not completely efficient, allowing those that invest in ‘information’ to exploit mispricing and thus achieve higher gross returns on average. However, these returns are just enough to cover the costs of seeking out the information. Meanwhile, those who do not invest in information receive lower gross returns. The net expected return is the same for both groups on average. The implication is that a GS equilibrium would see active investors generating higher gross returns than passive investors, but only just enough to offset the difference in costs.

GS’s perspective makes sense as a plausible equilibrium. It offers an explanation for why active management can cohabitate with passive investing. Indeed, the GS view effectively implies that Sharpe’s proposition does not accord with a rational equilibrium, as one would need to assume that active investors are irrational to explain

the existence of active management. That is, decision-making by active investors is impaired by behavioural effects that result in them making an irrational choice. This might be possible; and perhaps the current strong growth in passive investing is a sign of people waking up to past errors. However, relying on pervasive and persistent irrationality to explain the broad and extended use of active managers over many years seems a long bow. Mass delusion on this scale seems unlikely. Could people really be THAT stupid?

Another argument why equilibrium might look like that proposed by GS arises by considering the plausibility of the two extremes of either 100% active or 100% passive investing. Either extreme is likely to be unstable. A 100% active approach would amount to a costly competitive game in pursuit of active returns. Some of the losers—those with limited ‘skill’—would have an incentive to give up paying to play the game, and go passive. On the other hand, 100% passive investing would likely produce significant mispricings, given that no-one would be focussing on whether prices are correct. This would provide an incentive for some investors to go active, attracted by the existence of opportunities to exploit. The equilibrium mix between active and passive should sit in between these two extremes. It will probably be similar to the equilibrium described by GS, with active investors receiving some compensation for their cost and effort. The markets may currently be working towards such an equilibrium, having started from a 100% active approach a few decades ago.

In summary, the GS perspective is based on a theory of rational equilibrium and is consistent with the concurrence of active and passive management. Meanwhile, Sharpe’s proposition must rely on behavioural flaws to explain the existence of active management. Let us now look at some of the evidence.

5 Berk and van Binsbergen do the Sums, and Leippold and Rueegg Follow Up

While total returns for *all* active investors are hard to observe, evidence does exist on aggregated fund returns. The work of Berk and van Binsbergen (2015, 2016) provides an appropriate starting point, rather than the more traditional investigations of active returns earned by the ‘typical’ manager, given that their research directly measures the value-add from active managers as a group. Berk and van Binsbergen (BvB) also separate out the question of whether active managers add value from the issue of what net active returns are received by investors. They argue that the net returns earned by investors reflect how the market clears for fund management services, i.e. who extracts the value-add associated with any skill (or, from the GS perspective, the return from investing in information). Recall that under Sharpe’s proposition, active investors as a group should generate zero gross active returns but deliver negative net returns. Under GS’s equilibrium, one would expect to see positive gross returns and net returns of around zero. What BvB find for US equity mutual funds appears closer to a GS equilibrium than Sharpe’s proposition.

BvB estimate that the gross value-add versus the index over the period 1977 to 2011 is positive in dollar terms, averaging about \$3.2 million per year per fund. This seems inconsistent with Sharpe’s proposition, which tags active management as a zero-sum game in gross terms. However, it cannot be inferred that the zero-sum game notion is necessarily incorrect. It could be that active US mutual funds are generating returns at the expense of other investors not included in BvB’s calculations. Given that the US equity market is dominated by institutional investors, the identity of any significant losing group of active investors is not immediately clear. Other institutions such as hedge funds,

or asset owners that invest directly rather than outsourcing, are typically well-resourced professional investors. The evidence on hedge funds suggests that they do even better than mutual funds (see Agarwal *et al.*, 2015). Fund managers could be extracting substantial value-add from private investors, and evidence exists that private investors tend to underperform (e.g. Barber and Odean, 2013). This is a possibility, but given that private investors are a limited pool, there are constraints in the extent to which their errors could be supporting value-add for the large body of institutional investors operating in US equities. Indicative calculations provided in the context of the basic model of Section 3 suggest that if private investors comprised 20% of all active investors and underperformed the market by 1%, then this might support outperformance by institutional funds of 0.25% per annum.

When examining net returns after fees, BvB find outperformance based on a simple average, but underperformance weighted by assets. The negative asset-weighted result is the relevant result in the current context, and it is not fully consistent with a GS equilibrium which predicts that it should be zero. But then again, the net returns are not statistically significant. BvB (2016, p. 138) comment on their net return results as follows:

‘A positive net alpha implies that capital markets are not competitive. A negative net alpha implies that some investors are irrational in that they are committing too much money to active management. We find that the average net alpha to investors is statistically indistinguishable from zero. Thus we cannot reject the hypothesis that investors are rational and capital markets are fully competitive. As a result, managers are able to capture all economic rents their skills provide.’

The broad message arising from BvB is that active US equity managers possess ‘skill’, and that those with greater skill accrue greater AUM and earn more fees in aggregate dollar terms. In equilibrium, the value that managers create is captured

for themselves via the fees. Meanwhile the average investor in US equity mutual funds is *not significantly* worse off for investing actively relative to investing passively. Overall, what BvB describe approaches a GS equilibrium where the fees paid for manager insight is tantamount to the cost of seeking information, and managers are capturing the value arising from generating that information.

BvB only examine US equity mutual funds. Leippold and Rueegg (2020) examine aggregated performance for all equity and fixed income categories within the global Morningstar mutual fund database. Leippold and Rueegg (LR) compare performance of active funds with passive funds within each category, including returns both equally-weighted and asset-weighted, before fees (gross) and after fees (net), and for institutional versus retail funds. While the results vary across categories, the typical finding is that active funds outperform passive funds in aggregate in gross terms, but are closer to line ball in net terms. Only 3 categories out of 63 categories they examine (as listed in their Appendix) reveal results that are inconsistent with GS and consistent with Sharpe's proposition. These three categories are US Equity Large Cap Blend, Canada Fixed Income and Euro Fixed Income. LR also report aggregate estimates across broad asset categories. Only 'retail fixed income' delivers results that accord with what might be expected under Sharpe's proposition with gross returns near zero and negative net returns. The other broad categories more closely accord with a GS equilibrium where active funds generate positive gross returns.

6 Revisiting the Evidence that 'Active Management Underperforms'

There is a general perception that there exists a strong body of evidence that active managers do not create value for investors, and in fact largely

destroy value on average. It is argued in this section that this view is too harsh, and in any case does not in itself provide proof of Sharpe's proposition. There are a number of dimensions to the story, so the arguments will be presented as a journey that starts by outlining selected aspects from the academic literature for context, then drills down into some of the key issues, before circling back to provide an overall summary.

6.1 Aspects of the academic research on active management

A consistent conclusion drawn from the research is that the average US equity mutual fund has not delivered positive active returns to investors. For example, Jones and Wermers (2011) state in their review article:

'Following Jensen's seminal study (1968), numerous studies have reached virtually the same conclusion: The average actively managed mutual fund does not capture alpha, net of fees and expenses.'

This result is sometimes taken as clear evidence that active management should be avoided, often in conjunction with an appeal to Sharpe's proposition. A broader and deeper examination of the literature suggests that this amounts to overreach. The research on the performance of active funds does not support the general conclusion that active management should always be avoided. Nor should this research be taken as proof of Sharpe's proposition. The finding that the average manager underperforms after fees arises in the following context:

- Returns are typically measured after deducting fees as appearing in the database being examined, the average of which can be heavily influenced by the higher 'rack rate' fees paid by retail investors. This skirts two issues:
 - What gross returns were delivered: the main test of Sharpe's proposition

- If there are positive gross returns, whether the net return might be positive for investors who pay lower fees
- The bulk of findings relate to US equity mutual funds, which comprise a majority of retail funds along with some institutional funds offered as pooled mandates to larger investors. Any findings based on this data need not generalize to other areas, such as:
 - Institutional funds that are managed under segregated mandates (i.e. separately managed accounts)
 - Other equity markets
 - Other asset classes
- The research often tends to focus on the average or median returns across a manager sample. This generates dissonance with Sharpe's proposition in a number of ways:
 - Sharpe's proposition relates to all active investors, not a subset.
 - Sharpe's proposition relates to aggregate (asset-weighted) returns, not a simple average or median.
 - The benchmarking issue is fraught. The analysis typically evaluates returns against indices and factor models without necessarily considering costs or investability of these benchmarks. Also, the benchmarks themselves may be active strategies under Sharpe's definition.

6.2 Gross versus net returns

A closer look at the research results often reveals signs that the average active manager has created value for investors at the gross level, albeit statistically insignificant in many cases. The findings of BvB and LR pointing to positive gross value-add are found elsewhere. For example, in the widely-cited paper of Fama and French (2010), the average gross return is 0.18% p.a.

based on the CAPM (i.e. adjusting for the market only), and 0.39% under the four-factor model that also adjusts for exposure to value, size and momentum. A similar pattern emerges from Busse *et al.* (2010), who examine the performance of institutional US equity funds. While these authors highlight net alpha as being 'statistically indistinguishable from zero', a closer look reveals average gross benchmark-adjusted returns of 0.49% equally-weighted and 0.16% value-weighted. In addition, evidence exists that managers possess skill when examining the performance of the stocks they hold or trade, e.g. Wermers (2000); Baker *et al.* (2010); Anand *et al.* (2012); and Wermers *et al.* (2012). Overall the research seems to support the concept that active managers have added some value at the gross level, implying that either Sharpe's proposition is not supported and/or active managers are generating positive active returns at the expense of other active investors. The issue is hence not whether US active equity mutual funds create value on average. Rather, the key question is the extent to which this value-add is transferred to investors. Fees are a key flash point in this respect, and are discussed next.

6.3 Fees matter . . . a lot

The central role that fees play in whether active managers create value for investors is often overlooked. Much of the research into the performance of active funds uses the expense ratio appearing in the database being used, of which management fees are the main component. For example, the average active expense ratio in the CRSP mutual fund database—widely used by academics—is about 1.3%. This is reflected in the difference between gross and net returns reported by Fama and French (2010), for instance. The Investment Company Institute (2019) reports the average expense ratio for US equity mutual funds of 1.26% in 2018, having trended down from

1.68% in 2003. When focussing on the *average* net active return earned by active managers, it is the *average* fee that impacts on the results.

The average fee does not apply to all investors, and may be elevated by the fees paid by retail investors. Meanwhile, the bulk of assets under management accesses managers via wholesale channels and does not pay the retail rack rate. The weighted average expense ratio on US equity mutual funds reported by the Investment Company Institute (2019) for 2018 is 0.55%, reflecting 0.76% on active funds and 0.08% index funds. This is well below the simple average of 1.26%. LR report average fees of 1.18% for retail equity funds and 0.86% for institutional equity funds. These numbers are for pooled funds. Institutional investors pay even lower fees on segregated mandates. For instance, Mercer (2016) reports fees on US equity core institutional mandates³ of US\$500 million of 0.43% for All Caps and 0.32% for Large Caps.

The fee used to estimate net returns can be very influential when averaging net returns over large samples, given that average active returns are often a modest number better measured in basis points. Indeed, the fee assumption itself can determine whether a study finds that the average manager underperforms in net terms. For example, the average alpha reported by Fama and French (2010) ranges between -0.92% and -1.10% . These numbers would be shifted nearer zero if institutional fees were applied rather than the average expense ratio of $\sim 1.3\%$. The S&P SPIVA analysis,⁴ which regularly highlights the percentage of active managers that underperform the index, is also impacted by the average fee. The mid-year 2019 SPIVA report finds that 88% of US equity funds underperformed the index over the last 15 years. Given that the net return difference to the index over the period is -1.41% on average and -0.74% asset-weighted, the fee deducted can

matter a lot to the number of funds that fall below the benchmark. If fee levels for institutional mandates were applied, the net return might be shifted upwards by something in the order of 1.00% on average and 0.50% asset-weighted, such that the portion of underperforming funds would be much closer to 50% than the 88% highlighted by S&P.⁵

Finally, it is worth noting that fees for passive management are not zero, and in fact can be much higher than perceived for small retail investors in some circumstances. The Investment Company Institute (2019) reports average expense ratios in 2018 for index equity mutual funds at 0.62% (this is not a typo—see page 5 of the report); although the asset-weighted average is only 0.08% reflecting larger index funds being available at very low fees. Again the impact of the retail rack rate on the simple average versus the fees paid on the bulk of the assets comes into play. Fees for passive alternatives are often not considered in evaluating active management, with active performance traditionally being assessed against the returns for indices or factor portfolios from which no costs are deducted. Taking passive fees into account can further affect the comparisons between active and passive funds across different investor types.

The point is that fees are far from innocuous when evaluating whether active management adds value versus passive alternatives. The fact that fees can vary across fund share classes and investor types is an important feature that is glossed over when research focuses on the return of the ‘average’ manager. Not only does the existence of high fee funds within the data contribute to the impression that the average manager does not create value by raising the average expense ratio, but also the message that active management may have created value for some investors and not others gets lost in translation. The upshot is that the net return earned from active management can vary significantly across investors,

depending on the fee they pay. Investing using active managers may work for institutions who pay modest fees, while not working for retail investors who pay the retail rack rate.

6.4 *Institutional mandates versus pooled funds*

Research on institutional mandates is less prevalent than that examining pooled funds, largely because data on segregated mandates is less readily available. There is some evidence that the funds used by institutional investors deliver not only gross but also *net* outperformance, although the results are mixed. Perhaps the most comprehensive study is undertaken by Gerakos *et al.* (2016). They access a database of 22,289 funds used by institutional asset owners over the period 2000–2012, comprising \$25 trillion in assets under management (AUM) at June 2012—more than half of the institutional capital delegated to asset managers at that time. They find that these asset manager funds outperformed their benchmarks by 0.96% per annum before fees, and by 0.49% after fees.

An example of the divide between institutional and retail funds can be found in studies examining the performance of global equity managers. Researchers that are able to access institutional datasets tend to find outperformance albeit of varying significance, e.g. Dyck *et al.* (2013); Busse *et al.* (2014); Gerakos *et al.* (2016); and Gallagher *et al.* (2017). Meanwhile, papers considering global equity funds from either the Morningstar or CRSP databases uncover much weaker performance, e.g. Huij and Derwall (2011); Breloer *et al.* (2014); and Tsai and Wu (2015).

There may be some survivorship or selection bias at play, given the nature of the databases being used to study institutional mandates. Nevertheless, the results for such institutional funds stand in stark contrast to the view that there

is pervasive evidence that active management underperforms. Clearly, things are quite different for large-scale institutions relative to smaller investors who access funds through public channels. The performance difference between institutional mandates and pooled funds is due in a large part to lower fees, particularly relative to retail-orientated funds. For instance, LR find that institutional pooled funds tend to deliver higher net returns than retail pooled funds, and that this is largely related to the fee difference. However, segregated mandates also have other advantages. They support better manager oversight, and can help insulate against the adverse impact of fund flows arising from the actions of other investors. Research has estimated that the need to trade in response to investor flows can incur a return cost of around 1% p.a., see Edelen (1999); Coval and Stafford (2007); and Chen *et al.* (2010). This implies that returns to active management could be partly impacted by being embedded within structures that also offer liquidity services—a point we will revisit below.

6.5 *Dangerous to generalize from the US findings*

If there is anywhere that active managers are going to struggle, it is likely to be in the US. The US equity market is highly institutionalized and probably the most competitive in the world. It is precarious to rule out the possibility that active management might succeed elsewhere based on the performance of US equity funds. Although the evidence from other markets and asset classes is comparatively thin, it does suggest that greater potential exists for active management to add value outside of US equities. The divide between active manager performance in US equities versus other contexts comes through in three papers. First, LR found that the negative net returns delivered by US large-cap equity funds are not repeated in other markets, based on Morningstar data. The

second and third papers examine the performance of funds used by institutional asset owners. Dyck *et al.* (2013, p. 200) conclude:

'For sophisticated institutional investors, active management outperforms passive management by more than 180 bps per year in emerging markets and by about 50 bps in EAFE markets over the 1993 to 2008 period. In U.S. markets, active management underperforms.'

A similar finding with regard to US equities versus other markets emerges from Gerakos *et al.* (2016). Their breakdown of alpha across major asset class categories reveals that gross returns are positive for all asset classes, but are lowest for US equities at 0.39%. Meanwhile, their net alpha estimates are negative for US equities at -0.11% , exactly zero in global equities, and positive in the other asset classes examined including US fixed income (1.07%), global fixed income (0.97%), asset blends (1.00%) and hedge funds (0.69%). The results for US equities broadly square with Busse *et al.* (2010) who examine US institutional equity funds.

Although more evidence is needed,⁷ the finding that active management underperforms on average is not ubiquitous when one considers the research that looks beyond US equity mutual funds. Furthermore, as LR point out, the results outside of US equities do not square with the notion of active management as a zero-sum game in gross terms, and a negative sum game in net terms. Either Sharpe's proposition does not hold in many non-US markets, or active managers in these markets are better placed to generate active returns at the expense of other investors.

6.6 *Points of dissonance with Sharpe's proposition*

There is much dissonance between Sharpe's proposition and the research that examines average fund returns. First, Sharpe's proposition relates to all active investors, whereas actively

managed funds are only a subset. This issue was highlighted using the basic model of Section 3, and is further addressed in Section 9.

Second, Sharpe's proposition relates to aggregate (asset-weighted) returns, not the average or median fund return. Furthermore, the performance of the median fund (as well as the percentage of funds out- or under-performing) can be a misleading guide to the aggregate performance of active funds where returns are skewed, which appears to be the case even over the long run (see Bessembinder, 2018). In this regard, asset-weighted returns for active equity managers are often lower than the equally-weighted returns, e.g. see Busse *et al.* (2010), Fama and French (2010), BvB (2015, 2016) and LR (2020). These findings suggest that focussing on gross asset-weighted returns would move a step closer to providing support for Sharpe's proposition than the results based on simple averages.

Third, the academic research often evaluates returns using indices and factor models without necessarily considering the costs involved in accessing the benchmark, or even whether the benchmark was investible at the time. In particular, factor models do not gel with Sharpe's proposition at a rudimentary level, being a form of active investment under his framework. The manner in which factor benchmarks break the nexus with Sharpe's proposition was illustrated in Section 3 for the Fama–French model. In addition, it is highly debatable whether factor models are fair benchmarks (see Cremers *et al.*, 2013). Nevertheless, applying factor models does not seem to alter the estimates of active returns in any systematic manner, with excess returns versus the index often similar and sometimes lower than factor-adjusted returns depending on the study. Perhaps a bigger issue is that the costs of accessing passive alternatives are usually not accounted for, including the fees and trading costs entailed in implementing a

passive strategy. On this point, the work of LR comparing realized returns for active and passive funds is welcome. In any event, there is considerable discord between the results for active managers as reported in much of the widely-cited academic research, and Sharpe's proposition which is framed around the asset-weighted performance of all active investors relative to the alternative of investing passively.

6.7 Circling back to summarize...

Two themes emerge from the above tour of the academic research on the performance of active managers:

- (1) The broad generalization that active managers do not create value for investors on average is not supported by academic evidence. Indeed, the findings emerge as highly conditional. Support for the concept that active management underperforms after fees is strongest for US equity mutual funds, especially when analysed from the perspective of retail investors who pay higher fees. However, these findings do not generalize to institutional investors, especially those that are large enough to access segregated mandates and pay modest fees. Nor can the idea that active management underperforms be taken as applying across all markets or asset classes, given evidence that active funds have fared better outside of US equities.
- (2) Studying the net performance of the average (or median) active manager should not be taken as a direct test of Sharpe's proposition. The proposition is best tested through an evaluation of cap-weighted gross returns relative to cap-weighted passive funds, not average net returns using factor models. Furthermore, examining the average alpha across a sample of active funds does not amount to a test of whether *all* active investors earn lower returns relative to passive investors.

7 Wiggle Room for Active Investors to Outperform

It is a truism that *if* the index comprehensively covers an investment universe and passive investors continually hold that index, then active investors *must* also hold the index in aggregate for things to sum up. The zero-sum game *will* then apply at the gross level. Hence it is important to address where this characterization of the industry structure might break down, and whether it opens up sufficient gaps to permit active investors to generate gross returns that are meaningfully greater than those earned by passive investors. The basic modelling presented in Section 3 flagged two dimensions of this issue: where the market index does not comprehensively represent the market universe, and effects arising from the need of passive investors to trade when the index changes. This section examines these dimensions and related matters in more depth, drawing heavily on Pedersen (2018) who does an excellent job of discussing the issues. Openings for active investors to outperform as a group are highlighted in the process, some of which are alluded to in Sharpe (1991). In any event, it also needs to be recognised that the wiggle room is ultimately limited, and there will be a cap on the extent to which active investors as a group can earn higher returns than passive investors.

The index benchmarks that are used to measure market returns, and around which passive investment products are formulated, may provide incomplete representations of any market universe. For instance, the S&P 500 market capitalization at September 2019 stood at about 82% of the total US market as captured by the CRSP Total Market Index, although the Russell 3000 includes about 98% of the US market according to FTSE Russell. The widely used MSCI World and MSCI All Country World

Indices cover about 85% of the investible universe across 23 developed and 26 emerging markets. These key indices do not contain all available stocks in the markets they cover, and do not include all markets, e.g. frontier markets. MSCI makes adjustments for free float in the presence of blockholdings, and uses inclusion factors that lead to some constituents being incorporated at a discount to full market cap. For example, MSCI currently applies a 5% inclusion factor to China A-shares, which it plans to increase to just 20% in three steps.⁸ Thus there are substantial gaps relative to full coverage of the ‘market’ alluded to under Sharpe’s proposition. This provides scope for the portfolios of active investors to diverge from passive investors who replicate an index, especially those indices that are focused on a subset of larger, more liquid stocks.

The dynamic nature of the investment universe means that indexed funds *have* to trade in order to accurately track the index, although many index fund providers exercise leeway in implementing trades in order to limit the market impact.⁹ The requirement to trade can arise for variety of reasons, including:

- Trading due to flows arising from investor actions, such as new funds invested, withdrawals and rebalancing between asset classes, e.g. net creation and redemption of units in index ETFs precipitates buying and selling
- Reinvestment of income received; and principal at maturity in the case of fixed income
- Adjustments following index reconstitutions
- Responses to corporate actions, such as primary or secondary offerings, share repurchases, merger and acquisition activity, and so on.

Pedersen (2018) provides estimates of the magnitude of trading related to some of these sources. His turnover estimates are in the order of 5–10%

for the S&P 500, 10–15% for all the securities in the CRSP database, and over 40% for the Russell 2000. The turnover estimates for fixed income are even larger, at around 50% for the Bank of America Merrill Lynch Investment Grade Bond Index and over 90% for their High Yield Bond Index. This is in a large part because fixed income investments are rolled-over as bonds reach maturity. Some of these turnover estimates are quite large, yet probably understate the effective turnover of passive funds as they do not allow for the impact of investor flows. Such trading activity provides room for performance gaps between passive investors that aim to closely track an index and active investors as a group. In particular, the associated trades can provide opportunities for transfers of wealth between active and passive investors.¹⁰ This issue was highlighted by the basic model in Section 3 with regard to index rebalancing, and is discussed in depth by Pedersen (2018) as well as Anderson (2017).

To illustrate how turnover by passive funds might create return-enhancing opportunities for active investors, consider an initial public offering (IPO). There is often a gap between the investment in an IPO and its inclusion in an index. Whatever return is earned in the lead-up to index inclusion appears as an ‘active return’ that those replicating the index will not access. If the IPO performs well over this period (which often happens in the short-term, even if many IPOs prove to be poor long-term investments¹¹), the active investor will generate a higher return than the index. But can’t index funds access IPOs as well? Perhaps. Even then, this is not all it seems, as Pedersen explains. Active investors can choose their level of participation in IPOs, and this opens up an opportunity for them to game the passive investors. In a hotly sought-after IPO, it is plausible that passive investors (if they participate) could be allocated less than their share. If the price pops after the issue, the passive investors

end up bidding the shares off the active investors at higher prices in order to get to a market-weight position. In other words, they are underweight and hence effectively active investors during the transition phase. The wash-up is that passive investors end up buying from active investors at unattractive prices, resulting in a wealth transfer similar to that characterized by the model of Section 3. On the other hand, for unpopular IPOs, the passive investors will have no problems in securing their fill from the go-get.

Anderson (2017) further develops the line of argument. He notes that when index funds need to trade, they are often stacked on one side—either buyers or sellers. They are not holding a stock at market weight until the trades occur, and will need to ‘tease out’ active investors to take the other side of the trade. Furthermore, passive investors are relatively price insensitive. Although they may attempt to execute trades to minimize market impact, ultimately they need to trade and the price paid is not the primary consideration. This situation acts to the net benefit of ‘informed’ active investors. From the perspective of Sharpe’s proposition, until the required trades occur, the index funds are actually temporarily relatively price-insensitive active investors who hold the opposite position to the genuine active investors. To the extent they need to move the stock price to get to market-weight and hence close their active position, wealth may be transferred from the index funds to active investors. Anderson suggests that, as the portion of the market held passively rises, this mechanism of market clearing becomes more important and the opportunities for active investors will increase.

It is difficult to place reliable numbers on how this situation might impact the relative returns between active and passive investors, in part because they also rely on active investors making good decisions for them to benefit. Pedersen

offers a few ballpark figures, citing 0.18% p.a. from IPOs, 0.06% from secondary equity offerings, and a return drag related to trading costs of upwards of 0.20% for index funds associated with their required turnover. Petajisto (2011) estimates that the market impact costs associated with index rebalancing to have averaged 0.21–0.28% for the S&P 500 and 0.38–0.77% for the Russell 2000 over the period 1990–2005,¹² which he calls the ‘hidden cost of indexing’. Active investors can in theory avoid this cost. Overall, there appear to exist a variety of openings that leave Sharpe’s proposition far from water-tight, and provide room for skilled active investors to outperform those investing passively.

8 Differing Investor Objectives

Sharpe’s proposition is expressed in return space. There appears to be no discussion of whether Sharpe’s proposition is partially formed because it assumes that investors care only about return levels, implying that they are risk-neutral. Basically it ignores the possibility that investors may find it optimal to hold the market in other than cap-weighted form. This leaves a gap in the discussion and the research.

It is rational for investors with differing objectives and differing tolerances for various risks to hold differing portfolios. Admitting this possibility breaks the nexus with market-cap weights as the baseline position. That is, it may be rational for those seeking a ‘passive’ investment not to hold the market, and perhaps even be willing to accept a lower return or incur costs to achieve an alternate positioning. In a world where investors chose different portfolios in pursuit of different objectives, everyone would become ‘active’ investors under Sharpe’s proposition. Some would appear winners and others losers as measured by relative returns versus the cap-weighted market. Nevertheless, all investors may still be better off in utility terms to the extent they have achieved their

preferred position. Sharpe's proposition is blind to this possibility.

This somewhat subtle point is more readily understood by considering fixed income portfolios in the context of liability-driven investing. Liability-driven investors with different liabilities *should* be holding different fixed income portfolios by duration, credit risk and so on. This will look like active investing through the prism of Sharpe's framework. Some investors will win and some will lose relative to the overall fixed income universe in terms of returns, depending on how the yield curve and credit spreads happen to move. Nevertheless, all investors may still be satisfied with the outcome from the point of view of (say) having protected their funding ratios to the extent that it is possible or deemed desirable.

A similar logic extends to other ways in which objectives and preferences may differ across investors, including: the type of risks that investors are willing to bear; investment horizons; need for liquidity; and differences in tax status. Tax in particular is notable as it drives a wedge between gross returns generated by the market that are the focus of Sharpe's proposition, and the net returns that different investors experience. Another example is differences in preference for liquidity. An investor with high demand for liquidity may choose to hold more liquid securities even though they offer lower returns, leaving the higher-returning illiquid securities to those with tolerance for illiquidity. This could be a win-win for all, but would be considered a win-lose under Sharpe's proposition. It might also be extended to a reason why an investor might choose an open-ended fund for the liquidity services it offers, notwithstanding that this may come at a cost in terms of lower returns (Edelen, 1999; Coval and Stafford, 2007; Chen *et al.*, 2010). The associated cost to returns should ideally be squared off against the value of these liquidity services.

The concept being raised here is closely related to the notion raised by Scholes (2004) that risk transfer and liquidity provision can provide two additional sources of (sustainable) return generation in addition to beta and alpha as traditionally defined. Scholes' intuition is that some investors may be able to reap additional returns by providing risk transfer or liquidity provision services to other investors, who willingly pay for those services in order to reach their preferred position. Scholes' perspective aligns with the notion that investors with differing objectives may care about more than just the net return they earn.

9 Sharpe Does Not Rule out Outperformance by Active Fund Managers

There is nothing in Sharpe's proposition that prohibits active fund managers outperforming at the expense of other active investors who underperform. Indeed, Sharpe (1991) openly acknowledges this possibility, which was tentatively explored using the model of Section 3. Given that the active versus passive debate is typically framed as a choice between actively managed funds and passive investments such as index funds, this issue arises as rather central. It means that consideration should also be given to whether active managers have some competitive advantage over other investors in deciding whether an active approach may be appropriate.

Whether active managers can outperform overall at the expense of other active investors is a moot point. However, it is likely to be highly contingent on the market environment, in particular the nature of other investors in the market. It makes sense that it should be harder for US active managers to outperform given that the US market is dominated by institutions, meaning that there are fewer unskilled investors to exploit. Furthermore, there is some evidence that US equity markets have become more competitive over time, making

it even more difficult for active managers to outperform (see Pástor *et al.*, 2015). Evidence also exists that active management does better in sectors where the competition is lower; see Hoberg *et al.* (2017). Consistent with this concept, there are signs that active managers outperform in markets where there appears to exist a wider spread of investor types. For example, active funds appear to do better in emerging markets (e.g. see Huij and Post, 2011; Dyck *et al.*, 2013; Gallagher *et al.*, 2017), noting that these markets are often dominated by private investors.

Although not directly related to Sharpe's proposition, it is worth noting there is evidence that the potential for active managers to add value may be time-varying, changing with market conditions. For example, von Reibnitz (2017) finds that the most actively managed US equity mutual funds are able to earn significantly positive net alpha only when cross-sectional return dispersion is high, but not otherwise. Madhavan and Morillo (2018) present a model that provides theoretical support for this concept. There is also evidence of a relation between active fund performance and economic conditions, including Moskowitz (2000), Kosowski (2011), Glode (2011), and Kacperczyk *et al.* (2014, 2016). This literature provides mixed support for the notion that active managers may provide insurance by outperforming during downturns. The implication is that there may be a timing dimension to whether active management might be preferred over passive investing.

In summary, Sharpe's proposition that active investors should underperform as a group after fees should not be interpreted as implying that active fund managers must underperform, given that they exist as one sub-group amidst a broad spectrum of active investors. This suggests the need to look beyond Sharpe's proposition when deciding whether to use active managers, and

consider whether the market environment may support value generation by active managers at the expense of other investors.

10 A Decision Framework

If it is accepted that the choice between active or passive management should depend on the circumstances, then the question arises over how the decision might be made. Ezra and Warren (2010, 2014) provide a framework for deciding when to choose an active alternative over investing in a cap-weighted index. Ezra and Warren (EW) pose the question as a choice between a cap-weighted index and some other alternative, which dovetails with Sharpe's framework. The five reasons EW propose for considering an alternative to investing in a cap-weighted index are summarized below:

- (a) There is an absence of any replicable index in the market of interest. This reason is most relevant for alternative asset classes.
- (b) A cap-weighted index is available, but is unsuitable for the investor's purpose. EW cite liability-driven investing, socially responsible investing and tax-effective investing as examples. This speaks to the potential existence of differing investor objectives, as discussed above in Section 8.
- (c) The index itself is inefficient, meaning that one can do better than simply replicating it. EW allude to fundamental indexation and the shortcomings of fixed income and commodity indices. Consistent with this theme, the subsequent growth of smart beta appears to have much to do with a judgement by some investors that cap-weighting is inefficient.
- (d) The environment is conducive to active managers outperforming. The debate around active versus passive investing is often framed around this issue, which the current paper discusses in light of Sharpe's proposition.

- (e) The investor has the ability to identify skilled managers. This recognises that there may be managers available that can outperform even if Sharpe's proposition does indeed hold; and that having the skill to identify these managers could justify an active approach in its own right.

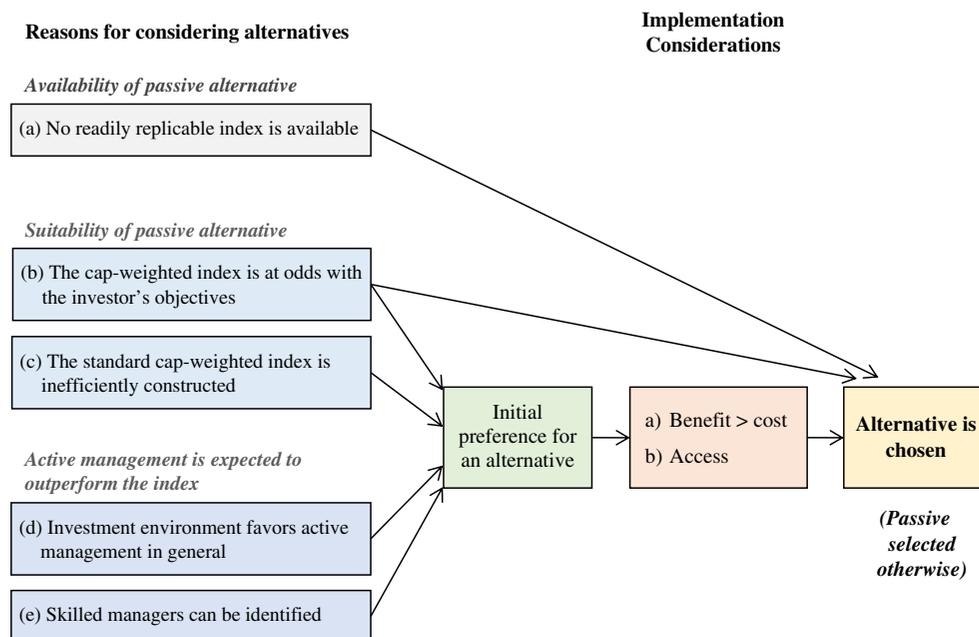
EW suggest addressing the five reasons to initially establish if there exists a case for an active alternative, after which cost (i.e. fees) and ability to access the active alternative are considered before a final decision is made. A passive cap-weighted approach is the default if there is no clear reason to choose an active alternative, or the costs or access are prohibitive. A schematic setting out their decision framework appears below.

Sharpe's proposition largely relates to point (d), given that it suggests that the environment is rendered less conducive to outperformance by active managers on the basis they are involved in a zero-sum game in gross returns and a negative sum

game in net terms. It is worth noting that point (e) related to identification of skilled managers is arguably more important than the performance of active managers on average, given that investors typically invest through selected active funds rather than buying the entire universe. Manager selection is not an easy task, and the literature examining the fund choices of investors suggests that many invest and redeem at the wrong time, e.g. see Goyal and Wahal (2008). Nevertheless, the experience of asset owners with active management as revealed in studies such as Dyck *et al.* (2013) indicates that some do have access to manager selection skill. Clearly this is another dimension along which the circumstances will vary across investors.

The key point is that the performance of the typical active manager should be seen as one component within a wide canvass of relevant considerations. In this regard, the EW framework appears more useful for thinking about the choice between active and passive investing than

Framework for Choosing an Alternative to the Passive Cap-Weighted Index - Ezra and Warren (2014)



primarily focussing attention on how active managers perform as a group. It appeals to the idea that it is more fruitful to establish whether an active approach or passive approach might be most effective given the particular circumstances. In doing so, it suggests extending the focus beyond the debate over whether active investing is unlikely to work based on Sharpe's proposition, or the evidence on the performance of the average manager.

11 Conclusions

The aim of this review has been to re-examine the academic evidence on active versus passive management from the perspective of the proposition by Sharpe (1991) that active investing is a negative sum game after costs. A key conclusion is that Sharpe's proposition should not be taken as an indisputable truism. While it is presented similar to a mathematical law, the underlying logic is not as water-tight as it may seem. Furthermore, it is not generally supported by the research examining the performance of active funds. Indeed, the research findings seem more in accordance with the equilibrium described by Grossman and Stiglitz (1980) than Sharpe's proposition. Nevertheless, the academic research does not directly test Sharpe's proposition, given that it examines the performance of actively managed funds which comprise a subset of all active investors. In addition, there is evidence that active managers can outperform after costs once one steps outside of the context of US equity mutual funds. Better performance emerges for active funds outside of US equities, and for institutional asset owners who can access active management at lower fees. While more research is needed, that which exists is sufficient to conclude that it is premature to write-off active management with reference to Sharpe's proposition and the research on US equity mutual funds.

Perhaps the most important question is whether active or passive (or some mix) is the better choice for a particular investor, given the circumstances they happen to face. Existing evidence suggests that retail investors who pay high fees and do not have access to manager selection skill might think twice before using actively managed funds. Before doing so, they might first consider whether an active approach either best meets their objectives, or if the market environment is conducive to active managers adding enough value to cover the fee they will be paying. Otherwise they may end up playing what is, for them, a negative sum game that is something in the nature of a lottery. For institutional asset owners that have access to segregated mandates at a low fee, and feel confident in selecting managers, the chances of success from an active approach can be much higher. The key message to emerge is that 'it depends'.

Notes

- ¹ Thanks goes to an anonymous referee for this suggestion.
- ² For instance, Morck and Yang (2001) estimate a valuation premium of up to 40% on S&P 500 constituents based on comparing against stocks not included in the index through matching by size and industry. This implies a return premium on stocks outside of the index, to the extent that their price-to-net tangible asset valuation metric partly reflects expected returns.
- ³ ERISA/Non-ERISA Qualified Institutional Pool Funds.
- ⁴ See <https://www.spindices.com/documents/spiva/spiva-us-mid-year-2019.pdf>. Note that S&P mentions that the returns are net of fees, but does not disclose the fee basis on which performance is estimated. After some investigation, it appears they are deducting the reported fee, similar to Morningstar and CRSP.
- ⁵ The percentage of funds underperforming can also be misleading in case where security and thus fund returns are positively skewed. However, there is no evidence of skewness being a major factor in the US active fund data appearing in the SPIVA report.
- ⁶ Two non-US markets where there is a reasonable body of research on active management include Australia and the UK. For Australia, evidence exists that active

managers have been able to deliver relatively strong gross active returns of sufficient magnitude to cover institutional fees and sometimes retail fees, e.g. see Chen *et al.* (2010); Bennett *et al.* (2016). For the UK, Mateus *et al.* (2016) find positive net alphas for UK equity mutual funds under the three-factor and four-factor model after correcting for the bias arising from alphas embedded in the benchmark, which they point to as a prime source of the negative alphas reported by earlier studies.

⁷ See <https://www.msci.com/documents/10199/43f3ee8b-5182-68d4-a758-2968b4206e54>

⁸ Some providers may also employ stratified sampling with a view to closely tracking rather than replicating an index, most notably in fixed income. This might be considered a very limited form of active investing under Sharpe's proposition.

⁹ Frino *et al.* (2005) provide an analysis of the reported trading activity of index funds associated with index reconstitutions based on daily holdings and trade data. The observed stock return patterns are consistent with the existence of opportunities for active investors to exploit.

¹⁰ For example, see Ritter and Welch (2002).

¹¹ The estimates of Petajisto (2011) are collaborated by inputting the averages for y_A , y_D , PI_A and PI_D and T as reported by Petajisto into the model that appears in Section 3, specifically Equation (7d).

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