When Should Investors Choose an Alternative to Passively Investing In a Capitalization-Weighted Index?

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Abstract

We present a framework for deciding when to choose an alternative to passively investing in capitalization-weighted indices within any particular asset class. Five reasons are identified for seeking an alternative. Three of these reflect situations where a capitalization-weighted index is either unavailable or unsuitable, while the other two relate to expectations that active management can outperform the index. We highlight the need to shift the debate over active versus passive investing towards a broader discussion that takes into account aspects such as differences across investors and the efficacy of the index itself. Our key message is that the best way to structure asset class portfolios is likely to depend on the circumstances.
How should asset class portfolios be structured? All too often this question sparks a heated debate over ‘active versus passive’ investing. This debate tends to be couched as a choice between these two alternatives, with much of the discussion focused around the performance of active equity managers. This paper is motivated by the idea that this perspective is far too narrow. We offer a broader framework that investors might use to decide their preferred investment approach in any particular asset class. The framework incorporates three aspects that are typically glossed over amidst the active versus passive debate. First is the central role of investor differences in any decision. Second is the notion that a standard market index may not always provide a suitable back-bone for portfolio construction. Third is the probability that the preferred approach will vary across assets. In sum, we aim to re-direct the debate over active versus passive investing towards a more general discussion of how portfolios might be tailored to the particular circumstances.

Our decision framework looks towards replication of a market capitalization weighted (cap-weighted) index as the point of departure, or default. It then considers five reasons for contemplating an alternative investment approach. Three of these reasons relate to the efficacy of the passive default, while the other two address the more familiar issue of access to managers who are expected to beat the index. The first reason is that no readily replicable index exists. The second and third reasons entail situations where a cap-weighted index is deemed unsuitable because it either fails to meet investor objectives, or is considered inefficient. The fourth and fifth reasons involve an expectation that active investing can outperform due to the environment being conducive to an active approach, and/or because skilled managers can be identified. Implementation issues such as relative costs and access are considered before a final decision is made. We illustrate our framework with situations where a particular alternative might be preferred. No definitive conclusion is offered on whether any one approach is necessarily superior. Indeed, the
over-arching message is that the best investment option may vary across asset classes, investors and perhaps even time.

**Conceptual Foundations**

This paper is directed towards the manner in which portfolios are typically constructed in practice. The investor is assumed to build their total portfolio from the primary building blocks of asset classes, in accordance with a strategic asset allocation that best aligns with their objectives and preferences. The facet we address is structuring of the component asset class portfolios. In doing so, it is assumed that the investor has formed a conception of the role that each asset plays in their total portfolio. While the investor aims to optimize their risk/return trade-off, we do not prescribe any definition of risk. Our framework permits the investor to view risk in terms of the asset class portfolio in isolation, the total portfolio context, or hedging motives as might arise under liability-driven situations. The aim is to optimally structure an asset class portfolio given the investor’s particular objectives, preferences and circumstances.

This practically-orientated approach diverges from finance theory by explicitly allowing for the possibility that portfolio separation may not hold, so that investors might not agree on any common, non-diversifiable risk factors. Separation implies that all investors ‘see’ the same efficient frontier, and design portfolios from combinations of exposure to the agreed factors. Returns can hence be divided into components associated with the common risk factors, and a residual with an expected value of zero. Under the traditional CAPM version of this theory for instance, the market portfolio provides a single source of non-diversifiable risk. While our approach nests separation as a special case, the existence of a diverse range of portfolio structures provides a strong hint that separation does not hold in practice. From a pragmatic perspective, it seems sensible to allow for the possibility that investors may regard any investment option differently in terms of its role and contribution.
to risk in their portfolios. Also note that we are offering an applied decision framework, not proposing theory (as done, for example, by Waring and Whitney, [2009]).

Our approach more closely aligns with the ‘applied’ view of portfolio structure based around the separation of alpha and beta. This view associates beta with “any market exposure that can be cheaply replicated” (Clarke et al [2009] p1), while alpha is the residual after accounting for market exposure. Hence beta manifests as a menu of exposures for building portfolios and providing a benchmark for performance evaluation (i.e. measurement of alpha).¹ Our framework concurs with the sentiment of selecting the exposures that best match objectives. However, it goes further by contemplating that investors may want to look beyond commonly-available market exposures to provide the structural back-bone for portfolio construction. It recognizes that readily available ‘betas’, in the sense portrayed under the ‘applied’ view, may not provide the market exposure an investor wants. That is, our framework explicitly accommodates building asset class portfolios around something other than standard market indices.

Investor differences play a central role under our framework. Here passively replicating a cap-weighted index may be rejected because it fails to satisfy the investor’s objectives, or because the investor holds a personal view that the index is inefficient. Investor differences can also provide the basis for expecting active management to outperform in two ways. One is where the investor believes that they themselves have access to manager selection skill. The other is where investor differences help to relax the ‘zero sum gain’ constraint identified by Sharpe [1991], which asserts that investors can outperform only if somebody else underperforms. Investor differences may give rise to situations where certain investors may be willing to accept below-index returns in order to meet their particular objectives. In other words, there may be gains to trade in terms of utility (see Darnell [2006]), even though the zero-sum game constraint may still hold in return space.
Our framework incorporates this possibility when considering the case for expecting active managers to outperform as a group.

Finally, we take issue with how the discussion over asset class portfolio structure has at times been conducted. Often this discussion takes the form of an adversarial debate over the relative merits of active versus passive investing, as if there were ultimately one ‘correct’ way to manage investments. There is also a tendency to make general statements based on the experience in equity markets. For instance, the bulk of academic literature examines the performance of US active equity managers. These studies deliver mixed results, but overall serve to cast significant doubt over whether the average US manager can reliably add value after costs (see, for example, Wermers [2000]). Proponents of passive investing cite these findings as support for index replication. Proponents of active management respond with arguments that the ‘skill is out there’. Framing the issue in this way greatly over-simplifies the matter. It is inappropriate to extrapolate results from one asset class, or sub-class like US equities, into other markets. There is little allowance for the role of investor differences in such discussions, and the efficacy of the passive alternative is rarely questioned. Finally, we believe the choice should not be addressed as binary. Investment options can extend from various passive configurations, through to products with degrees of activeness ranging from enhanced passive funds to long-short hedge funds. A multifaceted problem of portfolio design cannot be so readily reduced to a single dimension.

**A Decision Framework**

Figure 1 summarizes our framework. The framework uses the concept of passively replicating a cap-weighted index as the point of departure, in the sense of providing a baseline for comparison. It asks whether any other approach is preferable, given the objectives, preferences and circumstances of the particular investor.
Passive investing in a cap-weighted index is a natural point of departure where asset classes provide the basic building blocks of portfolio construction. Cap-weighted indices aim to represent the returns accruing to the total dollars invested in an asset class. Passive replication of such indices is typically the lowest cost option for achieving exposure, in part because cap-weighted indices automatically rebalance. A cap-weighted index is often the standard choice for performance evaluation. It is also more likely to have derivatives available to assist with implementation. If a suitable cap-weighted index is available, it should make a worthy default.

Five reasons are identified for considering some alternative to passive cap-weighted investing:

1. No readily replicable index is available
2. Cap-weighting is at odds with the investor's objectives
3. The standard cap-weighted index is inefficiently constructed
4. The investment environment favors active management in general
5. Skilled managers can be identified

The ability to implement the alternative at a net cost less than the expected benefit is addressed separately. In other words, the framework first works out whether there is an initial case for considering an alternative to passive cap-weighted investing, and then asks how much an investor is willing to pay and how the alternative can be accessed.
Our framework allows for flexibility in the design of asset class portfolios. In most cases, any alternative to passively investing in a cap-weighted index will be what is traditionally known as ‘actively managed’. In other circumstances, the skilled-based component may be minor, or another ‘passive’ configuration could be employed such as replication of alternative indices or managing towards specific factor exposures. How the framework aligns with the concept of alpha/beta separation is discussed later. We now examine the conditions listed in Figure 1.

**Reason #1: No readily replicable index is available**

The first reason to consider an alternative to cap-weighted passive investing is the lack of an index that can be readily replicated. Some alternative becomes the only option if no
index is available. Most unlisted assets, such as private equity, private real estate and private infrastructure, fall into this category. In other instances, an index might exist but replication could be problematic. Some relatively illiquid markets, such as small cap or emerging market equities and high yield debt, fall into this category. While passive products may be available, they might not deliver a faithful replication of the asset class at low cost. Such products sit in a grey area, where an evaluation is required of the suitability of the index as a candidate for replication.

Reason #2: Cap-weighting is at odds with the investor’s objectives

A second reason for considering an alternative is where the cap-weighted index is poorly aligned with the investor’s objectives. In such situations, some alternative approach may better meet these objectives, perhaps via employing active managers to help ‘tailor’ the portfolio. While the possibilities are somewhat open-ended, four notable examples are discussed below.

• **Tailored fixed-income mandates** – In fixed-income, an investor may desire a set of exposures that differ from that implicit in the standard index. A prime example is the wish to match a series of cash flows reflecting an explicit liability of the investor, such as with a defined benefit pension plan. Not only are the durations of the liability and the index typically substantially different, but the annual cash flow patterns are also typically very different. These differences will no doubt have been reflected in the initial modeling work from which the strategic asset allocation is derived, making a standard cap-weighted index inappropriate for implementation of the strategic asset allocation. Or, more simply, the investor may have a preference to explicitly control the magnitude of exposures like credit in recognition of its influence on the risk profile of the overall portfolio. Such objectives might be better achieved through building portfolios with a different structure to the standard index.
• **Listed infrastructure** – Some investors may want exposure to infrastructure for its particular characteristics, namely reliable cash flows and a degree of inflation hedge. Investors who look to the listed markets for their infrastructure exposure face the challenge that parts of the universe do not provide these features, e.g. US utilities. Investment products might be preferred that better align the portfolio with the desired attributes through restricting the investment universe to certain securities.

• **Sustainable and ethical investing** – Sustainable and ethical investing is a classic example of where objectives other than pure wealth maximization may create a desire to hold an alternative to the standard cap-weighted index.

• **Tax effectiveness** – Tax positions can drive a wedge between the index and the portfolio that best meets investor objectives. Conceptually, managing for tax efficiency should produce more optimal portfolios. However, this requires the capacity to actively manage the portfolio in a tax-aware manner. (Conversely, passive approaches tend to be more tax-effective than active management on a pre-tax basis, as the latter may generate extraneous taxes through greater turnover.)

**Reason #3: The standard cap-weighted index is inefficiently constructed**

Passively replicating a cap-weighted index can lack efficacy in situations where the index itself is thought to be inefficient. There is no point passively tying your investment to an index that represents a sub-optimal approach, providing that there is an alternative which can deliver a better outcome. Two potential reasons why an index might be inefficient include: (a) the index is built on a narrow or unrepresentative universe; or (b) the index is constructed in a way that builds in some inefficiency. In the latter case, the case for considering an alternative may also relate to a belief in market inefficiency by the investor. These issues are best outlined by discussing in the context of three examples.
• **Equities** – There are two notable examples where alternatives to cap-weighting have been proposed based on arguments that they offer a superior risk/return trade-off. The first is minimum variance portfolios, which appear to generate higher returns with lower risk in back-tests (see Haugen and Nardin [1991], Clarke et al [2006]). The second is fundamentally-weighted indices (see Arnott et al [2005]). The proponents of fundamental indexation argue that cap-weighted indices are necessarily flawed because index weights are correlated with pricing errors, i.e. cap-weighted indices overweight over-priced stocks, and underweight under-priced stocks. At its core, this is an argument that the market is inefficient which is closely related to the case for value investing. In both situations, the implicit suggestion is that a more efficient portfolio can be built by using an alternative weighting scheme. Either option may be attractive to an investor who accepts the underlying premise that cap-weighted indices are inefficient.

• **Fixed-income** – While fixed-income indices suffer from a plethora of shortcomings, two in particular strike at the issue of efficiency. First, some standard fixed-income indices are partial representations of the available universe. Thus they not only fail to fully represent the asset class, but there may be scope to build more efficient portfolios by including off-benchmark assets. Second, index composition is driven by cycles of issuance and retirement of debt. There is no guarantee that the available mix of fixed-income securities will amount to an efficient portfolio. Indeed, an argument might be made that the largest issuers may be less attractive, either because they are most in need of funding (and hence of lower quality), or are issuing debt to take advantage of low interest rates which are unattractive to the investor. These features may give some investors reason to believe that a relatively efficient fixed-income portfolio may be achievable under a more active approach. Indeed, such features appear to have contributed to the comparative unpopularity of passive approaches to fixed-income.
Commodities – Collateralized commodities futures funds have become a significant area of passive investment over recent years. As commodities do not have ‘market-caps’ in the usual sense, the link between commodity indices and the concept of a cap-weighted passive investment is problematic. We confine our discussion to certain production-weighted indices such as the S&P Goldman Sachs Commodity Index, as they most closely resemble the notion of cap-weighting and are widely used by passive funds. Such commodity indices might be viewed as inefficient for two reasons. First, they are heavily skewed towards energy and hence poorly diversified: the S&P Goldman Sachs Commodity Index was around 70% weighted in oil and gas as of November 2009. Second, a rule-based approach to rolling contracts can leave the index exposed to distortions associated with short-term supply/demand pressures. Investors who accept these points may conclude that an actively managed collateralized commodities futures fund offers potential to construct a broader and probably more efficient portfolio through avoiding the concentration of exposures by commodity and futures contracts.

In each example discussed above, preference comes down to investor beliefs about the suitability of the standard cap-weighted index, and whether a more efficient portfolio can be delivered through an alternative approach. We offer no comment on whether such beliefs may be justified.

Reason #4: The investment environment favors active management

Our final two reasons address the more traditional question of whether active management can be expected to outperform the index. Ultimately this boils down to selection of individual managers that can outperform. Nevertheless, it is useful to break the discussion into two parts. Reason #4 focuses on features that could lead to active investment managers outperforming a cap-weighted benchmark in aggregate. It asks whether there
are any generic reasons to favor active management in a particular asset class or subclass. Reason #5 addresses the issue of identifying individual managers with skill.

In gauging the potential for active managers to outperform the index, a forward-looking evaluation is desirable. Historical return data may still provide an instructive starting point. However, past returns can be an unreliable guide to future returns for a wide range of reasons, including selection bias, inability to invest in medians or averages, structural change in the manager universe and the effects of sheer randomness. Needless to say, it is even more dangerous to extrapolate the historical performance in one asset class such as US equities into other markets. A more helpful approach is to examine the environment in which managers operate, with a view to establishing if they have any competitive advantage as a group that could generate sustainable outperformance. Features that might support sustained outperformance are discussed below, grouped into three broad areas.

1. **Market inefficiency** – While market inefficiency provides the potential for active managers to persistently outperform the index, as pointed out by Siegel et al [2009], inefficiency is not sufficient to choose an active alternative in its own right. An additional requirement is that active managers are better placed than other investors to exploit any mis-pricing. Aspects of less-than-fully efficient markets that might provide active managers with a competitive advantage are listed below.

   - **Information advantage** – This can occur when the market is widely populated by less-informed investors that can double as both a source of inefficient pricing, and as candidates for taking the other side of trades. Examples of assets where this seems more likely include some emerging markets and small cap equities.
• Preferential access to desirable assets – In listed markets, preferential access usually means having first chance at IPOs, lines of stock, and so on. In unlisted markets like private equity and private real estate, existing relationships and ability to provide capital or skills can help in sourcing attractive assets.

• Partially segmented markets – Such markets may have greater scope for prices to get out of kilter under the influence of localized forces, e.g. domestic economic cycles and politics. An active manager operating across market segments may take advantage of any related mis-pricings. Emerging markets and global property are examples of the type of asset class that may offer potential from this standpoint.

• Economic value-add – In some situations, active management can add value to the underlying asset itself. This mainly occurs for unlisted assets like private equity and private real estate (see Kaiser [2005]).

2. Opportunities arising from investor differences – The idea that investor differences might give rise to a pool of investors who are willing to accept below-index returns was raised earlier. Related situations are identified below.

• Providing liquidity – Patient suppliers of capital may have scope to generate returns by providing liquidity to those requiring immediacy. A good example is the market-making of activities of enhanced index funds.

• Accepting risks that other investors are less willing to bear – Some investors may be better able to bear certain risks due to higher risk tolerance or superior capacity to diversify the risk within a broad portfolio. The clearer examples of such activities arise from non-traditional asset classes like catastrophe insurance, life settlements and perhaps writing volatility.
• *Differing time horizons* – Differences in time horizon can lead to varying perceptions of risk and value across investors that could offer up some opportunities. For instance, value investors may be able to exploit the short-term focus of markets if afforded the latitude to wait for value to be realized.

• *Other differences in pricing criteria* – Other differences that may give rise to opportunities through influencing the prices at which investors are willing to trade include disparate tax positions, and certain players being driven by non-fundamental criteria, e.g. dealings with the public sector.

3. *Index fails to cover the opportunity set* – Whenever existing indices are not comprehensive in their coverage of the available market, the potential may exist for active managers to outperform by investing outside the index universe.

In addition to the above three areas, consideration should be given to the intensity of competition between managers themselves. Too much competition can mean that opportunities quickly evaporate, or cannot be accessed in sufficient volume. Success is more likely when there are not too many active managers attempting to do the same thing. This aspect further warns against extrapolating from uninspiring performance by active managers in highly institutionalized markets such as US equities, into other markets or assets where competition between managers may be less fierce.

The cyclical dimension to active returns should also be borne in mind. Active management tends to struggle under certain conditions, such as when cross-sectional volatility and valuation spreads are relatively low, or when markets are driven by ‘thematic’ forces of a non-fundamental nature. The possibility that active returns may rebound following such periods could give rise to a transitory preference for active management. While cyclicity
has limited relevance for the long run, it may add a timing element to any evaluation of active investment.

**Reason #5: Skilled managers can be identified**

Where a suitable passive alternative exists, a belief that skilled managers can be identified becomes important in two ways. First, the ability to identify skilled managers could be a sufficient condition in its own right for choosing an active approach – regardless of how the average manager is likely to perform. Second, some capacity to evaluate manager skill is desirable in any situation where an active alternative is being contemplated. On the basis that both ‘good’ and ‘bad’ active managers exist, at the very least, bad managers should be avoided, as this could defeat the whole point of choosing active management.

To the extent that markets can never be perfectly efficient, some room should exist for outperformance through skill. Grossman and Stiglitz [1980] argue that just enough inefficiency should remain in equilibrium to provide an incentive to gather information. Opportunities for skilled managers to outperform would be available under this view, although no net excess returns should be expected from the average manager. It is also intuitive to expect that relatively skilled managers do indeed exist. An informal reason is that people (and hence fund managers) were not created equal.

The main issue is whether skilled managers can be confidently identified ex ante. Much of the related literature focuses on performance persistence amongst US equity mutual funds, with mixed and inconclusive results. In any event, one cannot extrapolate reliably from narrowly-focused research. Even if genuine skill was scarce amongst US equity managers, it could still potentially exist for managers in other areas. For instance, some evidence of return persistence exists for US bond mutual funds (Huij and Derwall [2008]) and private equity (Phalippou and Gottschalg [2009]).
Statistical evidence of historical performance persistence is just one aspect. Manager selection is approached in practice as a skill-based pursuit involving an element of subjective judgment, especially given the unreliability of past returns as a guide and the potential for structural change amongst the managers themselves. The existence of manager selection skill must be evaluated on a case-by-case basis, and will depend on manager research capability in the particular asset class in question. Inevitably, investors must form an individual judgment on whether they have access to sufficient manager selection skill to justify pursuing an active investment option.

**Implementation issues**

So far we have discussed five reasons for adopting an initial preference for some alternative to cap-weighted passive investing. Before committing to the alternative, it is necessary to consider whether it can be implemented at reasonable cost. There are two issues:

(a) **Cost versus benefit** – All cost differences should be identified, and weighed against the relative expected benefits. Relative costs are typically higher under an active approach. These include not only management fees and transaction costs, but also any manager research and monitoring expenses. Such costs may vary significantly across products and investors, in part due to influences such as scale and bargaining power. Allowance should also be made for the possibility that passive strategies need not deliver the index return. Trading costs arise from cash flows, index rebalancing and dividend reinvestment. Furthermore, index replication can sometimes be difficult and costly. The latter particularly applies in fixed-income, and for more illiquid asset classes such as small cap or emerging market equities.
(b) **Access** – It is not always automatic that an investor can access their preferred alternative. Capacity considerations and existing relationships may be important.

The ability and cost of accessing various alternatives can vary significantly across investors, providing yet another reason for differing approaches. For instance, retail and other smaller investors will typically face higher hurdles in justifying alternatives to passive investing, to the extent that they encounter much higher fees and have access to a more limited range of options.

**A Note on Alpha/Beta Separation**

We now relate our framework to the concept of alpha/beta separation, which has been a point of focus in the applied portfolio construction literature (see for instance Clarke et al [2009], Siegel et al [2009]). The real value in this approach arises from the distinction between beta and alpha. Beta is associated with market risk; it is broadly available; and it should be cheap. Alpha is the excess return after accounting for market risk. It is rarer but more valuable than beta; and is often equated with investment skill. The alpha/beta dichotomy is most effective when beta is well defined, commonly accepted and readily available. Unfortunately this is not always the case. At times beta cannot be easily purchased, or the investor may prefer something other than betas that are broadly available. In some circumstances, alpha and beta are bundled together and hard to distinguish, such as many alternative assets and where excess returns relate to the beta decision itself (e.g. market timing; the ‘exotic beta’ concept of Litterman [2008]).

We skirt such issues by using cap-weighted indexation merely as a point of departure, rather than designating it as preferred beta. Nevertheless, our framework synchronizes with the concept of alpha/beta separation where an investor is able to passively replicate the beta exposures they desire, and then separately pursue alpha. While this is clearest
where a suitable cap-weighted index provides the beta exposure that an investor desires,\textsuperscript{9} it can also occur in other situations. To illustrate, consider a fixed-income investor who desires sovereign bond exposure of a specific duration for liability-matching purposes, while believing they have access to fixed-income managers capable of outperforming the standard cap-weighted index. Both requirements can be accommodated providing that the desired beta can be accessed passively, and the alpha captured through mandating managers to invest relative to the standard fixed-income benchmark and hedging out the index exposure. Nevertheless, by not insisting that beta be defined by commonly available market exposures, our framework can accommodate a broader range of situations – including those where alpha/beta separation becomes problematic.

**Summing Up**

The attraction of passively replicating a cap-weighted index is that it can offer a low-cost method for gaining exposure to an asset class. However, there are a number of conditions under which a passive approach of this type no longer becomes optimal. These conditions extend beyond the choice between passive and active investing as traditionally defined. Considerations such as the particular circumstances of the investor and the efficacy of the index itself might also play an important role in determining the best way to structure an asset class portfolio.

We have suggested five reasons for considering an alternative to passively investing in a cap-weighted index. These reasons include ruling out a passive approach in the first instance either because no readily replicable market index exists, or because available indices are unsuitable due to not meeting the investor objectives or some imbedded inefficiency. Even where a suitable index exists, an active alternative might still be chosen due to an expectation that active management can do better. This expectation could arise
from confidence in the ability of active managers to add value in general, and/or capacity to identify skilled managers.

There has been a tendency to frame asset class portfolio construction in terms of the choice between active and passive, with debate focused on the historical performance of active equity managers. We believe this perspective is much too narrow. We have re-framed the issue as a matter of portfolio design given the circumstances, with an expectation that the preferred investment approach will vary across investors, asset classes and even time.

References


Clarke, Roger G., H. de Silva, S. Thorley. “Investing Separately in Alpha and Beta”, Research Foundation Publications, CFA Institute, (May 2009), corrected


Endnotes

1 The ‘industry’ view of portfolio structure is implicit in the active versus passive debate, which considers passive investing to be aimed at capturing some beta, and active investing towards the pursuit of positive alpha through investment skill.

2 We refrain from discussing hedge funds on the basis that they can be considered a collection of strategies to access asset classes, rather than an asset class in their own right.

3 See Warren [2009] for a discussion of how fixed-income exposures can impact on portfolio risk.

4 Arnott et al [2010] provide an overview of alternative methods of index formation other than cap-weighting, and how these methods are motivated by doubts over market efficiency.

5 Of relevance is the extent to which a passive alternative may be excluded from participating in new listings due to their exclusion from the index.

6 The first two items as listed are motivated by Scholes [2004].

7 Berk [2005] takes this argument further by suggesting that expected excess returns after costs will approach zero for all managers in equilibrium, reflecting the notion that skilled managers will continue to attract funds until their expected outperformance is eroded. Nevertheless, there remains room for particular investors to expect positive excess returns if some of Berk’s premises are relaxed, such as the assumption of commonly held expectations about manager skill.

8 Busse and Irvine [2006, p2252] summarize the extant literature by stating that “persistence of mutual fund performance therefore remains an open question.” Busse and Irvine themselves find evidence of persistence using Bayesian techniques; while Kosowski et al [2006] uncover statistically significant and persistent alpha amongst top performing US equity mutual funds by using a bootstrap approach. Evidence also exists of performance persistence within particular market segments. For instance, Kacperczyk et al [2005] identify return persistence associated with industry-related selection skill, while Davis [2001] finds US growth managers to have persistently outperformed their style benchmark.

9 Many investors would view their equity portfolios in this way.