CAMBRIDGE ASSOCIATES LLC

# ACTIVE OR PASSIVE MANAGEMENT? IT'S NOT THAT SIMPLE

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# C O N T E N T S

## ABSTRACT

1. The decision to use active or passive management is far from simple, as the conditions that favor one approach over the other vary tremendously across asset classes and investors. The ability of active managers to outperform passive investment options is influenced by a multitude of factors, including the choice and composition of benchmarks, the prevalence of non-benchmark securities, the concentration of assets across managers, the cost and availability of passive investment options, and the number and types of investors in an asset class. The favored approach can also differ by investor, as larger investors generally face a lower fee differential between active and passive management and have a greater capacity to monitor active managers than do smaller investors. Investors also have differing tolerances for weathering the inevitable periods of manager underperformance relative to benchmarks.

2. Investors considering active management, with a primary objective of outperforming market benchmarks, should only do so if each of two conditions is met: (1) the majority of active managers are expected to outperform the benchmark net of fees, **or** there are compelling reasons to believe the investor possesses manager selection skill; **and** (2) the investor is able to tolerate periods of underperformance.

3. The majority of active managers can outperform a benchmark under three conditions: (1) more knowledgeable investors outperform less knowledgeable investors; (2) managers hold non-benchmark securities that outperform the benchmark; and (3) the majority of managers with fewer assets under management outperform a minority of managers with significant assets under management. Of these three possibilities our analysis suggests the latter two have had the most influence on manager performance relative to benchmarks. It is unlikely that a meaningful informational edge can result in the majority of managers outperforming the market since a relatively small percentage of assets are held by individual investors (outside of mutual funds), and while some investments, such as emerging markets stocks, may have only a small following from research analysts, these stocks are being scrutinized by scores of investment managers.

4. In the aggregate, the performance of active managers relative to their benchmarks is often most heavily influenced by managers' tendency to consistently underweight the companies, sectors, or countries that have the highest weight in their capitalization-weighted benchmarks. Although most managers are generally unwilling to make huge bets versus their benchmark, they also tend to construct portfolios that are more equal-weighted. For example, since most U.S. mid- to large-cap managers perpetually underweight mega-cap stocks, the majority of these managers lagged their benchmark in 1999 and outperformed in 2000 primarily because they were underweight the mega-cap stocks and the technology sector. Similarly, the vast majority of global ex U.S. managers outperformed their benchmark throughout the 1990s by underweighting Japan, which had a dominant weighting in the major indices at that time.

5. The distribution of assets among managers in each of these equity asset classes is so concentrated that the majority of managers *must* outperform if the largest managers underperform in order for the asset-weighted return of all managers to match that of the benchmark as a whole. The notion of smaller

managers outperforming larger managers has some intellectual appeal, especially in asset classes like emerging markets, U.S. small-cap stocks, and REITs, in which the majority of constituents have a market capitalization of $2 billion or less. As assets under management grow, a manager's ability to purchase the smallest companies in (or outside of) the benchmark shrinks. Managers may also enlarge the number of securities in the portfolio in order to invest cash and may have limited ability to quickly create or unwind a position without significantly impacting the market price. While thoughtful managers will carefully manage their growth, many managers close well beyond the optimal point for maximizing excess returns. These arguments are at least partially offset by the benefits of a larger total management fee, which can attract and retain top talent, improving organizational stability and allowing for deeper portfolio management teams. Empirically, we found that managers with fewer assets under management outperformed in U.S. mid- to large-cap equities, U.S. small-cap equities, and emerging markets equities, while larger managers only outperformed in global ex U.S. equities during the eight years ended December 31, 2006.

6. It is impossible to determine with certainty whether most managers have outperformed historically. This is because benchmarks do not perfectly represent "the market," all manager databases are necessarily incomplete, and all manager databases suffer from the following inherent biases:

   - Survivorship bias: This bias tends to overstate performance as the vast majority of managers who disappear from the database over time probably do so as a result of poor performance. Survivorship bias can have a material impact on performance, as demonstrated by the following example: of the 148 global ex U.S. managers in our database at the beginning of 1999, 36% had disappeared eight years later and would not be included in a return series for the period 1999-2006.
   - "Add-in" bias: This bias occurs when "incubated" products are introduced into the database when performance is good, resulting in a performance history that is selectively backfilled into the database. Many of these products were tiny in their first few years of existence, and were not really accessible to most institutional investors. For example, at the beginning of 1999, our database had 301 U.S. small-cap products that remained in the database throughout 1999. However, our current database has 568 products with 1999 returns, so almost one-half of the managers with 1999 returns were not in our database in 1999.

7. To eliminate the add-in bias and minimize survivorship bias, we conducted a year-by-year analysis using the database as it existed at the beginning of each of the last eight years (i.e., creating a new universe at the beginning of each year), and excluding managers with assets of less than $50 million. A small amount of survivorship bias remains, as some managers dropped from the universe throughout each year. While recognizing that eight years of data is little more than a curiosity, this analysis provides a framework that will become more useful in future years, as we gather more data. One of the most interesting observations, with the usual caveats regarding eight years of data, is that the very largest U.S. small-cap managers have underperformed on average, even before fees, supporting the investor belief that significant assets can be a hindrance in this space. Full results of this analysis are provided in Appendices A through C.

8. While some investors have demonstrated success in selecting active managers, the data indicated that *in the aggregate*, investors have not exhibited manager selection skill during this limited period and would have fared better from randomly picking managers.

    - Asset-weighted manager returns matched or lagged equal-weighted manager returns in all but one equity asset class (larger managers outperformed in global ex U.S. equities over the period), illustrating that the performance of the average dollar invested lagged the expected return from randomly picking a manager.
    - Similarly, the ten largest managers at the beginning of each year underperformed the rest of the manager universe by a substantial amount in U.S. large-cap, U.S. small-cap, and emerging markets, with the ten largest managers outperforming in global ex U.S.

9. Implications for investors:

    - Most managers have permanent bets against their benchmark. It is critical that investors understand these bets and their implications.
    - Database biases will overstate the "true" performance of active management relative to index funds over time, as poor-performing managers drop out of the database and good performance for incubated products gets backfilled.
    - Smaller investors should give more consideration to indexing than should larger investors, as the fee gap between active and passive management is higher for smaller investors.
    - Among the equity asset classes examined, the conditions favoring active management appear greatest in global ex U.S. developed markets and weakest in U.S. large cap.
    - Investors seeking to maximize excess return should consider smaller managers in the asset classes in which significant assets under management may be a hindrance (e.g., small cap and emerging markets) and carefully scrutinize how these managers deal with growth to determine if their ability to add value is likely to become impaired.
    - Those wishing to blunt the impact of a bear market should recognize there is no reason to believe that active management in the aggregate adds more value in a down market, beyond the impact of cash holdings, which serves as a drag on performance over the long term.
    - Picking good managers appears difficult, and the distribution of excess returns among managers is enormous in most of the asset classes evaluated. Investors prone to terminating their managers after periods of short or significant underperformance are likely better off indexing regardless of what the data show.
    - Investors hiring active managers should devote far more resources to their manager selection process than is now customary—unless they have a thorough understanding of their managers, investors cannot possibly develop sufficient confidence to stay the course when managers underperform (as *all* managers do at one time or another). Such investors cannot hope to be successful without a coherent, disciplined, explicit, long-term strategy that serves both as a blueprint for the future and also as a mechanism for combating behavioral risk (i.e., the risk of ill-judged hiring and firing on the basis of short-term performance).

**SUMMARY**

## Introduction

While many investors have strong views on whether active or passive management is more desirable, this issue is hardly clear-cut, as the conditions that favor one approach over the other vary tremendously across asset classes and investors. The ability of active managers to outperform passive investment options is influenced by a multitude of factors, including the choice and composition of benchmarks, the prevalence of non-benchmark securities, the concentration of assets across managers, the cost and availability of passive investment options, and the number and types of investors in an asset class. Furthermore, the punishment for "getting it wrong" varies considerably by asset class, given the significant differences in distributions of manager returns relative to benchmarks. Investors also have differing tolerances for weathering the inevitable periods of manager underperformance relative to benchmarks, and depending on their size, face different fee differentials between active management and passive management. Finally, the ability to measure historical manager performance relative to the market is limited given the biases inherent in manager databases and the differences in "market" performance as expressed in different benchmarks of a given market.

In this paper, we review the conditions necessary to regard active management as more appealing relative to indexing. For four equity manager mandates, we discuss the characteristics of active managers in our database, the popular benchmarks, the general bets embedded in active management, and indexing options to develop a framework for evaluating the expected performance of managers relative to benchmarks. We then apply this methodology to our manager database using data from 1999 forward, as we are best able to minimize difficulties associated with database biases over this recent period. We examine the performance of active managers from two angles: a year-by-year analysis that minimizes database biases, and a constant universe analysis that tracks the performance of managers that were in our database at the start of 1999. We also assess the success of manager selection in the aggregate over this period by comparing the return to the average dollar invested versus the return to the average manager, and the return to the most popular managers versus the rest of the manager universe.

## Indexing Versus Active Management

Under what set of conditions should an investor choose an active management strategy or a passive, indexed strategy? The decision is dependent not just on the opportunity set of managers from which the investor can select, but is also dependent on the investors' own resources and skill sets.

When investing in any asset class in which inexpensive passive alternatives are widely available, investors with the primary objective of outperforming the market (as opposed to preserving capital, or limiting volatility relative to the market, for example) should only consider active management if they have compelling evidence to suggest their active managers will outperform the market index net of fees by a margin significant enough to justify both the higher costs and the greater risk of active management.

Passive indexing should be considered for the following reasons:

- Substantially lower fees than for active management.
- Lower transaction costs than those of almost all active managers, due to relatively low turnover, low commission rates, and minimal impact on the bid/ask spread.
- No cash drag, since index funds remain fully invested.
- No manager performance issues since the returns should consistently match those of the benchmark index (before fees and transaction costs).
- Relatively simple implementation and monitoring.

However, passive investing still requires some time and effort. Investors must choose among a variety of indices and passive managers. Nor are these trivial decisions since the composition of the major indices covering a market can differ considerably and their returns vary widely.[1] When substantial differences among indices exist, investors should devote the necessary time and effort to ensure that they understand the construction and mechanics of the various indices, the methodologies of the various managers offering index tracking products, and the variability of returns implicit in whatever approach they choose.

Finally, investors should consider their tolerance for various risks, such as volatility, divergence from market benchmarks, and capital impairment in relation to their return objectives when deciding whether to pursue active or passive management.

**Conditions Necessary to Consider Active Management**

Investors considering active management, with a primary objective of outperforming market benchmarks, should only do so if *each* of two conditions is met:

1. (a) The majority of managers are expected to outperform the benchmark, net of the costs of active management, or

   (b) There are compelling reasons to believe the investor, or the investor's advisors, possess manager selection skill.

2. The investor is able to tolerate inevitable periods of underperformance relative to market benchmarks.

[1] Financial innovation continues to blur the distinction between "active" and "passive" management. For example, the recent evolution of fundamental indices that are passively managed, but weight holdings according to fundamental factors rather than market capitalization, represent a form of passive management, while some quantitative products that rely on algorithms are another step along the way from passive to active management. In this paper, we define passive management based on the most common benchmarks utilized by active managers and low-cost index providers to represent the investable universe within a given manager mandate.

**Condition 1(a): Can the Majority of Managers Beat the Benchmark?**

A common argument for indexing is that investors make up the market, and therefore must earn only the market return in aggregate. Stated differently, the pursuit of excess return is a zero-sum game, before fees and transaction costs, in which investors can only outperform at the expense of other investors. However, this argument means only that the *asset-weighted* return to *all* investors must match the capitalization-weighted return of the *complete* universe; it does not mean that most institutional money managers must necessarily fail to outperform a benchmark. The majority of managers can outperform a benchmark in any of the following three scenarios:

1. **They win at the expense of less knowledgeable investors.** Although the comprehensiveness of analyst coverage varies considerably among asset classes, it is reasonable to assume that many investments continue to receive little or no coverage from research analysts. This phenomenon would suggest that some markets exhibit inefficiencies that should allow institutional managers with good research capabilities to gain an informational advantage over less-informed participants.

   However, this argument has two primary limitations. While one hopes and assumes that institutional money managers are more knowledgeable than individual investors, the total dollar value of individual investors' holdings (outside of mutual funds)[2] does not seem to constitute a significant percentage of many markets, leaving relatively little to be gained at their expense. In addition, while it is certainly true that some investments, such as emerging markets stocks, generally have only a small following from research analysts, these stocks are being scrutinized by scores of investment managers. Both of these limitations reduce the likelihood that a meaningful informational advantage can enable the majority of active managers to outperform the market.

2. **They win by holding non-benchmark securities.** Managers may outperform a given benchmark as a result of holding non-benchmark securities. Managers will hold these securities for three primary reasons: first, their benchmark may not fully represent their investment opportunity set. For example, among U.S. small-cap indices, the Russell 2000® is most often used to benchmark small-cap managers. This index excludes a large number of small-cap stocks, particularly in the months prior to its annual reconstitution, as turnover in the past eight years has ranged from 47.6% (June 2000) to 17.3% (June 2004). Similarly, small-cap managers may also hold other non-benchmark securities, like initial public offerings, micro-cap companies, or companies that were small cap when first purchased but are now more properly classified as mid cap or large cap. Purchasing such securities may enable a small-cap manager to outperform a specified benchmark, while staying reasonably true to the investment mandate.

   Second, managers will opportunistically hold securities somewhat outside of their mandate in order to outperform market indices. Examples include U.S. large-cap managers buying smaller companies

[2] There is no compelling reason to believe that managers of institutional money consistently outperform those managing retail mutual funds (gross of fees). In fact, many of the managers in our database manage both retail mutual funds and institutional assets.

and ADRs, and global ex U.S. managers opportunistically purchasing emerging markets and Canadian securities, which are excluded from popular benchmarks.

Finally, managers typically hold some level of cash, either in an attempt to time the market, or more commonly, as a result of cash flow management. The use of cash equivalents is likely to result in outperformance in falling markets and underperformance in rising markets. In addition, there is no evidence that managers in the aggregate can successfully market time. Therefore, cash holdings are likely, on average, to act as a drag on performance over the long term.

3. **They win by outperforming a minority of managers with more assets under management.** If institutional and retail fund managers were the only investors (i.e., no individual investors existed) and were not allowed to purchase non-benchmark securities or to hold cash, then the asset-weighted return of a universe of managers would match that of its benchmark (before fees and transaction costs). However, the *majority* of managers can still outperform if managers with less assets under management outperform larger managers (i.e., the equal-weighted manager return exceeds the asset-weighted manager return). The table below displays the year-end 2006 asset concentration within the Cambridge Associates LLC Investment Manager Database for three equity asset classes, splitting U.S. equities into mid to large cap and small cap.

**Manager Concentration as of December 31, 2006**

| | U.S. Mid- to Large-Cap | U.S. Small-Cap | Global ex U.S. Equities | Emerging Markets |
|---|---|---|---|---|
| Total Assets ($ billions) | 2,704 | 525 | 1,039 | 205 |
| Total # of Managers | 650 | 533 | 164 | 60 |
| 10 Largest Managers (%) | 28.4 | 15.9 | 37.2 | 57.7 |
| Top Quartile by Assets (%) | 85.3 | 68.8 | 75.9 | 72.2 |
| Bottom Quartile by Assets (%) | 0.5 | 1.3 | 1.0 | 3.1 |

The distribution of assets among managers is far from equal, with the smallest managers having only a tiny fraction of total assets. The "true" distribution is likely even more skewed, as the managers that choose not to participate in our database tend to be very small managers. Assets are sufficiently concentrated that a majority of managers *could* outperform the asset-weighted total return. In fact, the distribution of assets is so lopsided, with just ten managers holding over a quarter of the total assets in each area except small cap, that *if* the largest managers underperform, then the majority of managers *must* outperform in order for the asset-weighted return to match that of the sector as a whole.

In fact, over the eight-year period ended December 31, 2006 (the period over which we can minimize database biases), smaller managers outperformed larger managers in U.S. mid to large cap, U.S. small cap, and emerging markets, and the ten largest managers in each of these areas lagged the rest of the

universe. Size was a positive for global ex U.S. managers, perhaps because of economies of scale for fishing in such a large pond.

The notion of smaller managers outperforming larger managers has some intellectual appeal, especially in asset classes like emerging markets and U.S. small-cap stocks, in which over two-thirds of constituents have a market capitalization of $2 billion or less (Exhibits 1 and 2). As assets under management grow, managers are faced with new challenges. A manager's ability to purchase the smallest companies in the benchmark and small companies outside the benchmark shrinks. The manager may also enlarge the number of securities in the portfolio in order to invest cash and may have limited ability to quickly create or unwind a position without significantly impacting the market price.[3] The manager's focus may also shift from return enhancement to asset preservation.

The practice of many U.S. small-cap managers and even some large-cap managers of closing to new businesses and explicitly stating to potential clients that further assets will diminish their ability to outperform, adds support to the notion that value-added may diminish once assets grow beyond a certain point. Given managers' high profit margins from the last assets added, human nature suggests that the point at which some managers close is beyond the optimal point for maximizing excess return. A thoughtful manager will know, well in advance, the constraints of factors such as liquidity, trading volume, and percentage ownership of a company's shares outstanding and will implement a plan for capacity accordingly.

These arguments are at least partially offset by the benefits of a larger total management fee, which can attract and retain top talent, improving organizational stability. A larger product able to support three portfolio managers and seven analysts should have an informational edge over a small shop with one portfolio manager and two analysts.

To summarize, the majority of active managers could theoretically outperform the benchmark, but this outperformance must come at the expense of less knowledgeable investors, benchmark inadequacies, or larger managers.

**Have the Majority of Active Managers Outperformed Historically?**

We don't know! Nobody does. We do know that if we look at the managers active in our database today, that the majority of these managers outperformed over the last ten years in each asset class. This type of statistic is often cited as "proof" that the majority of active managers beat their benchmark. However, this is a statistical delusion—all it tells us is that any active manager hoping to survive for ten years had better outperform the benchmark.

[3] For example, a small-cap manager with assets of $2 billion and an equal-weighted portfolio of 70 stocks cannot invest in two-thirds of the companies in the Russell 2000® Index if wishing to avoid owning more than 3% of a company's outstanding shares.

Unfortunately, we cannot comment with certainty on the past performance of active managers for three reasons:

1. **Outperform what?** The choice of a benchmark can have an enormous impact on the results since the returns may differ substantially across indices. For example, the five-year annualized return through December 31, 2006 is 27.0% to the MSCI Emerging Markets Index and 28.7% for the broader S&P/IFC Investable Composite (Emerging Markets) Index. If emerging markets managers returned 28% on average during this period, did they outperform?

2. **Incomplete data.** Institutional databases depend on manager participation. Although we believe our database to be one of the most comprehensive, it does not capture 100% of the institutional opportunities available. For instance, poorly performing single-product managers may have little incentive to participate. There is also some disagreement over the definitions used to classify managers. For example, the categorization of managers as *growth*, *core,* or *value* investors is subjective.

3. **Database biases.** All manager databases suffer from survivorship bias and all institutional databases have "add-in" bias, both of which tend to overstate historical manager performance (Appendix A). The magnitude of survivorship bias can be illustrated by comparing the number of managers in the database at the beginning of 1999 with those remaining in the database at the end of December 2006. For example, our manager database had 132 global ex U.S. equity managers in the database at the beginning of 1999 with assets over $50 million. By December 2006, 46% of these managers were inactive. A reasonable assumption is that most of them had performance problems, so the eight-year return looking back today at the survivors will be higher than the actual return earned from investing across the managers available in 1999.

   A second database problem, unique to institutional databases, is the "add-in" bias, which occurs when "incubated" products are introduced into the database when performance is good, resulting in a performance history that is selectively backfilled into the database. Many of these products were tiny in their first few years of existence, and were not really accessible to most institutional investors. For example, at the beginning of 1999, our database had 312 U.S. small-cap products that remained in the database throughout 1999. However, our current database has 584 small-cap products with 1999 returns, so almost one-half of the managers with 1999 returns were not in our database in 1999. If substantial numbers of managers have either dropped out of the race or incubated products unavailable to most investors, we cannot accurately determine, for example, the mean and median ten-year returns of the universe of managers actually accessible to institutional investors ten years ago.

Clearly, gathering unbiased data on the performance of active managers can be a daunting task. However, we have taken a number of steps to help reduce the impact of these biases, providing data that may allow us to glean some insight into the performance of active managers (Appendix A). The trade-off is that we provide our data analysis over an eight-year period, which is not nearly long enough to provide

confidence in the ability (or inability) of managers to outperform the market. Indeed, at the very least, 20 years of data over multiple market cycles would be necessary. Nonetheless, our data analysis sets up a framework that will become more useful in future years, as we gather more data.

### Condition 1(b): Are There Compelling Reasons to Believe Investors Possess Manager Selection Skill?

"Proving" an investor has manager skill is just as problematic as "proving" a manager will add value over the benchmark. Investors cannot know if they have manager selection skill; they can only know if they have a sensible implementation process in place to maximize their odds of success. Investors hiring active managers should devote far more resources to their manager selection process than is now customary—unless they have a thorough understanding of their managers, investors cannot possibly develop sufficient confidence to stay the course when managers underperform (as *all* managers do at one time or another). Such investors cannot hope to be successful without a coherent, disciplined, explicit, long-term strategy that serves both as a blueprint for the future and also as a mechanism for combating behavioral risk (i.e., the risk of ill-judged hiring and firing on the basis of short-term performance). For those who cannot overcome this behavioral risk, some form of passive investing is probably a better option than active management.

### Condition 2: Patience with Manager Underperformance

Investors typically hire and fire managers primarily on the basis of recent performance. However, there is no compelling evidence of *persistence* in manager performance in these asset classes over periods even as long as five years—in other words, there is nothing inherent in performance data that enables one to assume that a manager successful in one five-year period will be equally successful in subsequent periods. This means that random selection is likely to prove just as successful as the selection of managers *solely* on the basis of their performance over the past three or five years. Furthermore, even the most skillful manager pursuing such a discipline will underperform "the market" during many three- or five-year periods—which defines the typical limit of most investors' tolerance for underperforming managers. Precisely because there is no sound basis for hiring or firing managers *solely* on the basis of recent performance, investors should make far more rigorous efforts to understand why and to what extent a given manager might be expected to add value, and of just how much that manager is likely to deviate from an appropriate benchmark index (both for better and for worse), when, and for how long. Only then will investors develop sufficient confidence to stick with successful managers during those periods when they lag the market, and avoid the expense and inevitable disappointment that comes from firing recent "losers" and replacing them with recent "winners."[4]

While some investors have demonstrated success at selecting active managers, in the aggregate, over the limited period for which we have bias-adjusted data, investors have not only exhibited a lack of manager selection skill, but would generally have been better off randomly selecting managers.

[4] For more detailed discussions on manager selection, see our reports, *U.S. Stock Manager Selection* (1998), *Firing Managers: Should Performance be Your Guide?* (2000), and *Manager Hiring and Firing* (2003).

## Evaluating the Outlook for Active Versus Passive Management

The degree to which conditions are present that would enable active managers to outperform passive benchmarks in the aggregate varies significantly by asset class. We discuss below the characteristics of managers in our database, the degree to which the popular benchmarks cover each of the asset classes included in this paper, the general bets embedded in active management, the distribution of manager returns, and indexing options available.

### U.S. Mid- to Large-Cap Equity Managers

**The Database.** At year-end 2006, The Cambridge Associates LLC Investment Manager Database had 650 actively managed U.S. mid- to large-cap equity managers with total assets of $2.7 trillion. Roughly 8% of these managers had assets of less than $50 million. The top quartile of managers made up 85% of total assets, with the smallest quartile accounting for less than 1% of total assets.

**The Benchmarks.** Nearly all large-cap or mid- to large-cap "core" managers will benchmark to the S&P 500 Index or the Russell 1000® Index, with most managers willing to accommodate either benchmark for separately managed accounts.[5] Each index is capitalization-weighted, with the 20 largest companies making up 31% of the S&P 500 Index and 28% of the Russell 1000® Index at year-end 2006. At the other extreme, the smallest 100 companies totaled only 3% of the S&P 500 Index and 1% of the Russell 1000® Index. The primary difference between the two indices is that the Russell 1000® Index has a much higher allocation to mid-cap stocks. For example, the 697 companies in the Russell 1000® Index with a market capitalization of less than $10 billion accounted for 20% of the market capitalization of the index versus 9% for the 205 companies in S&P 500 Index in the same capitalization range. There are minor economic sector differences, with the most notable being a 9.8% allocation to energy in the S&P 500 Index versus 9.0% in the Russell 1000® Index. Many managers with a clear style bias (i.e., growth or value bias) prefer the relevant Russell 1000® style index, while others prefer the broad-based S&P 500 Index or Russell 1000® Index over the style indices, often in an attempt to avoid being pigeonholed into a particular slot by the consulting industry.

**The Capitalization Bet.** Nearly all large-cap and mid- to large-cap managers have a capitalization bet against the benchmark, underweighting the mega-cap stocks with an offsetting overweight to smaller stocks. This bet arises because managers tend to create portfolios that are reasonably equal-weighted, while the benchmark is heavily concentrated. For example, suppose a manager benchmarked to the S&P 500 Index likes five of the 20 largest stocks that represent 31% of the S&P 500. If the manager holds a 3% position in each, its 15% weighting will represent a substantial bet against mega-cap stocks. At the other extreme, suppose a manager likes 25 of the 100 smallest companies representing 3% of the S&P 500 Index (i.e., the manager likes the same proportion of the smallest and largest companies in the index). The manager holds each at 1% to justify the research work and to have an impact on the total portfolio if successful. Note that within the portfolio the larger companies are held at three times the weight of the smallest companies (i.e., a

[5] The S&P 500 is by far the most commonly used benchmark for retail and institutional mutual funds, even for many managers with a clear style bias.

3% position versus a 1% position), yet the portfolio's allocation to the smallest companies in the index is eight times their weight in the index.[6]

Managers often further increase their mid-cap bias by holding smaller, non-benchmark companies. This is particularly true for managers that benchmark against the S&P 500 Index, using this benchmark by choice or at the demand of clients, since as noted above, this index has limited exposure to mid-cap stocks.

This capitalization bet means that in the aggregate, the majority of active managers will tend to outperform the benchmarks in periods in which mid-cap stocks beat mega-cap stocks (e.g., 2000-05) and lag in periods in which mega-cap stocks beat mid-cap stocks (e.g., 1995-99). Another way of stating this is that active management outperforms when the equal-weighted indices beat the capitalization-weighted indices. By itself, this does not mean that investors should favor active management in periods in which investors expect mid-cap stocks to beat mega-cap stocks, and vice versa, as it is expensive to use active management just to overweight mid-cap stocks. One can always combine a mid-cap index fund and large-cap index fund to cheaply create the desired capitalization bet. In addition, because managers tend to hold cash, while indices by definition hold none, managers tend to outperform in down markets and underperform in up markets, with the strongest manager outperformance occurring in years, such as 1981 and 2000, when the S&P 500 experienced negative returns and mid-cap stocks outperformed large-cap stocks.

The capitalization bet suggests that the Russell 1000® Index or relevant style index is a more appropriate benchmark for most managers than the S&P 500 Index, since the Russell indices have a higher allocation to mid-cap stocks and are a better reflection of the opportunity set used by managers.

**Indexing Options.** Indexing options are plentiful for each of the popular indices. Fees for institutional class mutual funds that seek to replicate the return of the S&P 500 Index or Russell 1000® Index ranged from 5.0 basis points (bps) to 16.0 bps. Large institutions can get even lower fees through commingled vehicles with sliding fee schedules. For example, fees for a $200 million account in a commingled vehicle range from 3.3 bps to 6.0 bps, and for a $400 million account, from 2.6 bps to 5.0 bps at three popular fund providers. Fees are slightly higher for separately managed accounts, as managers are not able to realize economies of scale in custody and recordkeeping.

[6] If large-cap managers are underweighting mega-cap stocks in the aggregate, then who is holding these securities? We believe defined benefit plans, retirees, and index funds hold disproportionate amounts of mega-cap stocks. Defined benefit plans are much more prevalent among mega-cap companies than mid-size companies, and many plans will invest 5% to 10% of pension assets in company stock. Individual investors, especially retirees, also tend to hold large, well-known companies in individual accounts. Investors focusing on dividends also gravitate to the largest companies. There are vastly greater amounts in S&P 500 Index funds than in Russell 1000® Index funds, so that a greater proportion of a mega-cap company's stock is likely to be held in an index fund relative to a mid-cap company that is not in the S&P 500 Index.

**U.S. Small-Cap Equity Managers**

**The Database.** At year-end 2006, there were 533 U.S. small-cap managers with assets of $525 billion in our database. Roughly one-seventh of these managers had assets of less than $50 million. The top quartile of managers oversaw nearly 69% of assets. Approximately one-fifth of managers were closed to new investments. The smallest quartile managed just 1% of total assets. The number of managers in the database climbed steadily over the eight years, from 260 managers at the start of 1999 to 533 today.

**The Benchmarks.** The Russell 2000® Index and its style indices are by far the most popular benchmarks, with over 75% of managers citing one of these three indices as their primary benchmark. In addition, some managers use the S&P SmallCap 600 Index. The most notable difference between these benchmarks is that the Russell 2000® Index has a greater allocation to smaller companies (e.g., under $500 million) than does the S&P SmallCap 600 Index. The Russell 2000® Index has also historically had a few percentage points more in technology stocks and less in energy stocks than its S&P counterpart, due in part to S&P's stringent financial quality requirements for inclusion relative to Russell.

The choice of benchmarks can have a dramatic impact on results. For example, over the eight-year period ending December 31, 2006, cumulative total returns for the Russell 2000® Index and the S&P SmallCap 600 Index were 107% and 141%, respectively. In fact, while active managers generally outperformed over the period when compared to the Russell indices, the average asset-weighted excess return of active managers was negative when performance was measured using the S&P indices.

**The Capitalization Bet.** Assets under management can have a dramatic impact on portfolio characteristics versus the benchmark, particularly in asset classes with small and relatively illiquid securities. As of December 31, 2006, 49% of companies in the Russell 2000® Index, including 20% of its capitalization, had a market capitalization of less than $500 million. In addition, many companies have low trading volume. Despite these constraints, the largest quartile of managers at year-end 2006 had $1.3 billion or more in assets under management. A manager with $1.3 billion in assets and a 65-stock portfolio has an average position size of $20 million, precluding investing in hundreds of securities (i.e., the least liquid) in the Russell 2000® Index. This illustrates that as assets grow, managers face a shrinking investable universe and will generally drift upward into the capitalization spectrum, face higher market impact costs, and/or will increase the number of holdings. The impact of these constraints is even more onerous on the ten largest managers in our database that are benchmarked to the Russell 2000® Index as of December 31, 2006. These managers each had over $4.8 billion in product assets, with an average-weighted market cap of $2.4 billion, compared to $1.1 billion for the Russell 2000® Index. Nine of the managers had a median market capitalization in excess of $1 billion versus $654 million for the benchmark.

Since small-cap managers with fewer assets under management have a broader investable universe than do managers taking on more assets, they have a higher probability of outperforming a benchmark that includes the full range of investment choices. Offsetting the negative aspect of significant assets to some degree, larger managers may have a fee advantage, greater resources, and more organizational stability than smaller managers.

While the capitalization bet tends to be most significant among larger managers, it also persists in the aggregate, implying that active managers will generally look better versus the Russell indices when mid-cap stocks beat smaller stocks, and vice versa. We have purposely used the phrase "look better" instead of "add value," as this is a structural bet embedded in the industry caused by a combination of the economics of the business and benchmark deficiencies, rather than bets based on perceived valuations resulting from intense research.[7]

To demonstrate the magnitude of this bet, we ranked the 32 quarters ending December 31, 2006 by the return gap between the Russell Midcap® Index and the Russell 2000® Index (Exhibit 3). In the 11 best quarters for mid-cap stocks relative to small-cap stocks (average gap of 340 bps) the median *quarterly* excess return gross of fees was an astonishing 120 bps, with 60% of managers outperforming on average. In the 11 worst quarters for mid cap relative to small cap (average gap of -340 bps), the median was 0.1%, with 48% of managers outperforming before fees. However, the experience of managers during the ten middle quarters for mid cap relative to small cap was similar to that of the 11 worst quarters, suggesting that managers' relative performance is influenced by reasons other than just the mid-cap bet.

This capitalization bet also suggests a benchmarking problem in the small-cap world, as nearly all of the larger managers will underweight the smaller companies in the index, and hold a significant number of non-benchmark (i.e., larger) securities. Assuming our database captures the vast majority of small-cap managers, a good test of the relevance of the benchmark is to examine asset-weighted excess returns, which will be reasonably close to zero if most of the managers are investing within the benchmark. Yet, in 1999 and 2000, the asset-weighted excess return of small-cap managers averaged over 700 bps.

Manager selection skill is of particular importance for success in active management of small-cap equities, given that the distribution of manager performance is quite wide, tracking error relative to benchmarks is high, and performance measurement is complicated by managers' significant bias to mid-cap stocks. Investors favoring active small-cap managers should recognize these manager dynamics and exercise patience. Use of several managers may also be beneficial in reducing tracking error, particularly if the managers' value added is expected to have relatively low correlations. The small-cap fund-of-funds environment provides some evidence of a lack of past success in manager selection. We identified only six fund-of-funds, but found reference to several that had liquidated over this period due to poor performance. Over the three years ended December 31, 2006, none of the surviving fund-of-funds beat its stated benchmark. Four fund-of-funds had a five-year track record, with only one ahead of its benchmark. This suggests that even the professionals have a hard time with manager selection. Perhaps in this asset class more than others, investors that are quick to fire poorly performing managers or that tend to hire the well-known, top past performers, are better off indexing.

[7] The capitalization bet is not just caused by assets under management. It is arguably a better use of a manager's resources to invest 3% of a portfolio in an $800 million company the manager knows well than to hold a 0.5% position in six tiny companies. Furthermore, investors sometimes take a negative view of a large number of portfolio holdings. The capitalization bet could also be partly attributed to the desire of many managers to hold their winners as they increase in value and move beyond the small-cap universe.

The data also have manager structure implications for investors. Over the last decade, there has been a shift toward hiring specialized small-cap managers, usually combining a small-cap growth manager with a small-cap value manager. Yet the distribution of value added among style-specific managers is far wider than that among well-diversified small-cap core managers. Short-term returns to style-specific managers are likely to either be well above the index, attracting significant assets and changing the characteristics of the portfolio, or be well below the index, leading to significant asset loss, organizational risk, and a high probability of termination. Alternatively, low tracking error, diverse small-cap managers may be able to maintain longer-term relationships with investors as they are likely to grow or lose assets at a slower pace and are able to support a higher asset base than growth or value managers due to their larger investable universe.

**Indexing Options.** Most of the large index providers offer institutional index funds benchmarked to the Russell 2000® Index. Fees are generally 7 bps to 10 bps for institutional funds. There are also a small number of funds, including exchange-traded funds (ETFs), available for those wishing to index one of the Russell style indices or the S&P SmallCap 600 Index. Investors should expect tracking error of several bps with each fund and have a clear understanding of how the fund handles benchmark reconstitution.

**Global ex U.S. Equity Managers**

**The Database.** Our database had 164 global ex U.S. managers at year-end 2006, with approximately $1.0 trillion total assets under management in this mandate. Assets are extremely concentrated, with the ten largest managers overseeing 37% of total assets. The largest manager had almost $99 billion under management. At the other extreme, the smallest quartile managed 1% of total assets. Twenty-five managers in our database were closed or semi-closed.

**The Benchmarks.** The MSCI Europe, Australasia and Far East (EAFE) Index is by far the most frequently used in the asset class, with 93% of managers in our database identifying it as their primary benchmark. The MSCI All Country World ex U.S. Index is the benchmark used by most of the others. The most significant difference between the indices is that the MSCI All Country World ex U.S. Index has a 15% weighting in emerging markets and a 6% weighting in Canada, both of which are excluded from the MSCI EAFE Index. These capitalization-weighted indices are dominated by the United Kingdom and Japan, which together made up 46% of the MSCI EAFE Index and 37% of the MSCI All Country World ex U.S. Index at the end of 2006. Over the eight years ended December 31, 2006, these differences have led to noticeably different returns. The MSCI EAFE Index posted an annualized return of 7.0%, while the MSCI All Country World ex U.S. Index returned 8.7% annualized as emerging markets and Canada outperformed the EAFE countries.

Historically, Japan has had a significant weighting in the MSCI EAFE Index, peaking at about 65% in the late 1980s. Japanese equities languished throughout the 1990s, with a ten-year annualized return of -1% versus 13% for the rest of the index. Nearly all active managers underweighted Japan throughout this decade, due to concerns over valuations or simply a desire to hold a more diversified portfolio. This highly successful bet against the indices contributed to the vast majority of managers beating their benchmark

throughout the 1990s. Managers no longer make persistent big bets against Japan as Japan's weight has fallen to about 23% of the MSCI EAFE Index and 18% of the MSCI All Country World ex U.S. Index, diminishing the potential impact of an underweight position. Although the majority of managers in our database still underweight Japan, the average underweight position is generally small, and often little more than a byproduct of holding non-benchmark countries in the portfolio. For example, at year-end 2006, 74% of managers underweighted Japan, with an average underweight position of about 4 percentage points. Looking at manager returns over the last eight years, we find that the performance of Japan relative to the EAFE ex Japan Index no longer has the explanatory power it once had.

**Non-Benchmark and Capitalization Bets.** From a theoretical point of view, this is the equity asset class in which active managers may have the greatest opportunity for outperformance, since managers can make bets against the benchmark at many levels: country, sector, security, currency, and opportunistic bets in non-benchmark securities. The non-benchmark securities include emerging markets and Canada for managers benchmarked against the MSCI EAFE Index and small-cap stocks for all managers. For example, as of December 31, 2006, roughly two-thirds of the managers in our database had investments in emerging countries. Among these managers, the average portfolio held almost 11% of assets in emerging markets securities. Adding Canada and smaller companies likely raises the average allocation to non-benchmark securities to about 20%.

The use of non-benchmark securities and the tendency for managers to construct portfolios that are more equal-weighted than their benchmark means that active managers will generally look the best relative to their benchmark when smaller companies are outperforming larger companies and when emerging markets are beating developed markets. For example, in the 11 best quarters for emerging markets relative to developed markets over the last eight years, the median *quarterly* gross excess return versus the MSCI EAFE Index was 110 bps, with 65% of managers outperforming, versus a median of -10 bps and 47% of managers outperforming in the 11 worst relative quarters for emerging markets (Exhibit 4).

**Expectations for Active Management.** Over the last eight years, investors in the aggregate have clearly benefited from active management, generating excess returns that have averaged 270 bps annually, gross of fees (Appendix C). However, we caution investors to have lower expectations for active management going forward, perhaps 50 bps to 200 bps gross of fees, as conditions over the last eight years have been very favorable to active management. For example, the eight-year annualized return to emerging markets, small cap, and Canada through 2006 is 17.9%, 11.7%, and 11.9%, respectively, versus 7.0% for the MSCI EAFE Index, so these non-benchmark bets have generally been quite successful. Furthermore, the eight-year performance of active management is heavily influenced by 1999, a year in which managers' equal-weighted and asset-weighted gross average excess return exceeded 1,300 bps, due in part to outsized returns to those managers overweighting technology and to emerging markets beating developed markets by 4,000 bps. Since 1999, the percentage of managers outperforming each year net of fees, assumed to be 100 bps, has ranged from 35% to 66%. Note also that in each of the last eight years, the spread between the 5th percentile manager and 95th percentile manager has been at least 1,500 bps. While the data suggest investors in the aggregate will likely benefit from active management, the experience of single investors will differ substantially.

**Indexing Options.** Investors preferring a passive approach have several options from which to choose. Fees for institutional index funds benchmarked to the MSCI EAFE Index are generally about 10 bps to 20 bps, while the very largest investors can establish separate accounts at even lower fees. A variety of country and regional index funds are available through institutional money managers or through ETFs.

**Emerging Markets Equity Managers**

**The Database.** Our database included 60 emerging markets managers at the end of 2006. The largest quartile of managers held approximately 72% of total assets with the smallest manager in this quartile overseeing roughly $4.7 billion. The two largest managers account for 18% of total assets. Sixteen managers were closed or semi-closed to new investors as asset size for many managers has swelled simply due to the enormous returns to this asset class (e.g., 37% annualized over the last four years).[8]

**The Benchmarks.** The MSCI Emerging Markets Index is by far the most popular, with approximately 87% of managers in our database citing it as their primary benchmark. The S&P/IFC Investable Composite Index is used by some managers. Country weights and economic sector weights differ slightly, with a differential of less than 1 percentage point for each country and sector.[9] The primary difference is the number of holdings, 1,724 for the S&P/IFC Investable Composite Index versus 850 holdings for the MSCI Emerging Markets Index. This has led to meaningful return differences. For example, the eight-year annualized return through December 31, 2006 is 17.9% for the MSCI Emerging Markets Index and 19.3% for the broader S&P/IFC Investable Composite Index as smaller companies have outperformed larger companies. This is a meaningful difference, and the choice of benchmark can influence one's view on the value added from active management in this space as the asset-weighted excess return to active management over these eight years is positive versus the MSCI Emerging Markets Index, but negative versus the S&P/IFC Investable Composite Index.

Investors employing these benchmarks should be aware that both have relatively large weightings in China, Korea, Russia, and Taiwan, with these four countries making up about one-half of each benchmark. While the weighting to these countries simply reflects the size of these countries' equity markets, such large weightings do expose investors to a fair degree of country-specific risk. Additionally, the company distribution is top-heavy. For example, the two largest stocks in MSCI Emerging Markets Index included

[8] By comparison, only six managers were closed at the end of 2003, and the smallest manager in the largest quartile managed only $1.6 billion in assets.
[9] The S&P/IFC Investable Composite Index has 22 countries versus 25 for the MSCI Emerging Markets Index. Three of the four smallest countries in the MSCI Emerging Markets Index (Colombia, Jordan, and Pakistan) in total include less than 1% of the index, and are not included in the S&P/IFC Investable Composite Index.

4.5% and 3.2% of the index at the end of 2006, versus an average company weighting of only 0.12% in the index. As in other asset classes, active managers systematically underweight outsized positions and hold larger, overweight positions in stocks that appear in the index with relatively small weightings.[10]

Except for a few large holdings, the vast majority of emerging markets companies are small- and mid-cap securities, by U.S. standards. For example, at year end, 751 of the 850 companies in the MSCI Emerging Markets Index had a market capitalization of less than $5 billion, and accounted for 40% of the index by weight. About one-half of the companies had a market capitalization of less than $1 billion, suggesting the largest managers in the industry may face a restricted investable universe versus smaller peers.

**Indexing Options.** The fees and tracking error associated with index funds are much higher in emerging markets than in other asset classes, and may include entry and exit fees. We are able to identify three institutional index funds that seek to replicate emerging markets indices.[11] An ETF is available for the MSCI Emerging Markets Index, but expenses total 77 bps. A large number of regional and country ETFs have also incepted within the last two years, so that index options are available for most of the larger emerging markets countries.

## Implications for Investors

The analysis of the environment for active versus passive management has several implications for investors:

- Most managers have permanent bets against their benchmark. It is critical that investors understand these bets and their implications.
- Database biases will overstate the "true" performance of active management relative to index funds over time.
- Smaller investors should give more consideration to indexing than should larger investors, as the fee gap between active and passive management is higher for smaller investors.
- Investors seeking to maximize excess return should consider smaller managers in the asset classes in which significant assets under management may be a hindrance (e.g., small cap, emerging markets). If a smaller manager is successful, assets will likely grow quickly. Investors should carefully scrutinize how these managers deal with the growth to determine if their ability to add value is likely to become impaired.

[10] If emerging markets managers are underweighting the largest companies, who is holding these investments? Recall many global ex U.S. developed country managers are holding some emerging markets investments. These holdings are typically larger emerging markets "blue-chip" companies. The underweight to the largest countries in emerging markets portfolios is likely offset by the existence of open and closed-end country funds for the largest emerging markets countries.

[11] The Vanguard Group offers an index fund benchmarked to a customized index. Fees are 25 bps for the institutional class, with an entry and exit fee of 50 bps. State Street Global Advisors offers funds that seek to replicate the S&P/IFC Investable Composite Index and the MSCI Emerging Markets Index. Fees range from 15 bps to 25 bps, depending on assets.

- Those wishing to blunt the impact of a bear market should recognize there is no reason to believe that active management in the aggregate adds more value in a down market, beyond the impact of cash holdings, which serves as a drag on performance over the long term.

Picking good managers has been difficult, and the distribution of excess returns among managers is enormous in most of the asset classes evaluated. Investors prone to terminating their managers after periods of short or significant underperformance are likely better off indexing regardless of what the data show.

Those committed to active management should assiduously avoid hiring managers that have recently chalked up superior results, since all our research points to the improbability of this persisting from one period to the next. The best time to hire a manager is after a period of relative underperformance, provided the fundamental characteristics of the manager's strategy and organization remain strong. Investors should also place managers with very large assets under management and/or those whose assets under management have grown the fastest in recent years under considerable scrutiny, since research indicates these managers also tend to lag their smaller competitors in subsequent years.

Most critically, investors' due diligence, hiring, and ongoing monitoring processes should be sufficiently rigorous, their understanding of a given manager sufficiently thorough, and their confidence in the manager's capabilities sufficiently assured, that they are prepared to tolerate periods of relatively poor performance, seeing these as opportunities to add assets at a low point in the cycle, rather than as reasons for firing. Benchmarks should be carefully selected, and investors should have a good understanding of how performance should be expected to differ from the benchmark under full market cycles to provide a more meaningful understanding of manager success and failure.

Finally, investors should have realistic expectations of manager performance and a thorough understanding of:

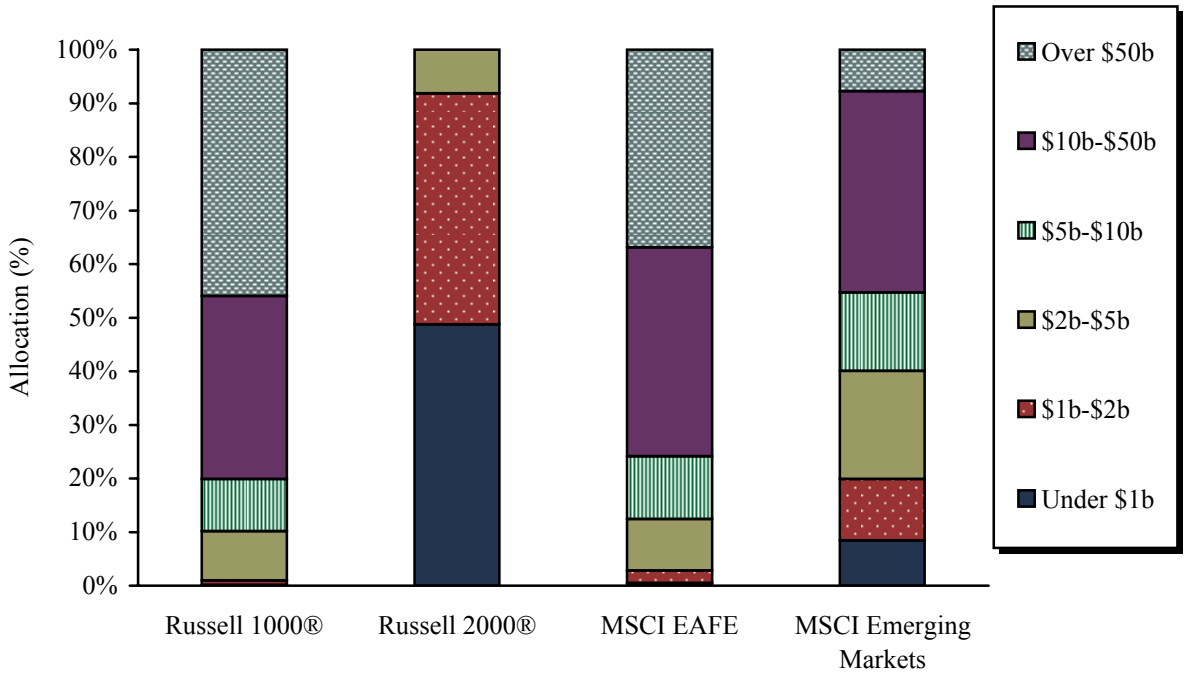
- How much and for how long the manager's performance is likely to deviate from that of a suitable benchmark index—in other words, what is the range of expected deviation?
- The manager's investment approach and the performance implications of that approach.
- The inefficiency being exploited by the manager and the reason this inefficiency is expected to persist.
- How subsequent growth in assets under management might affect the manager's ability to exploit this inefficiency.

**EXHIBITS**

**Exhibit 1**

**THE BENCHMARKS:**
**WEIGHT IN INDEX BY MARKET CAPITALIZATION**

**As of December 31, 2006**



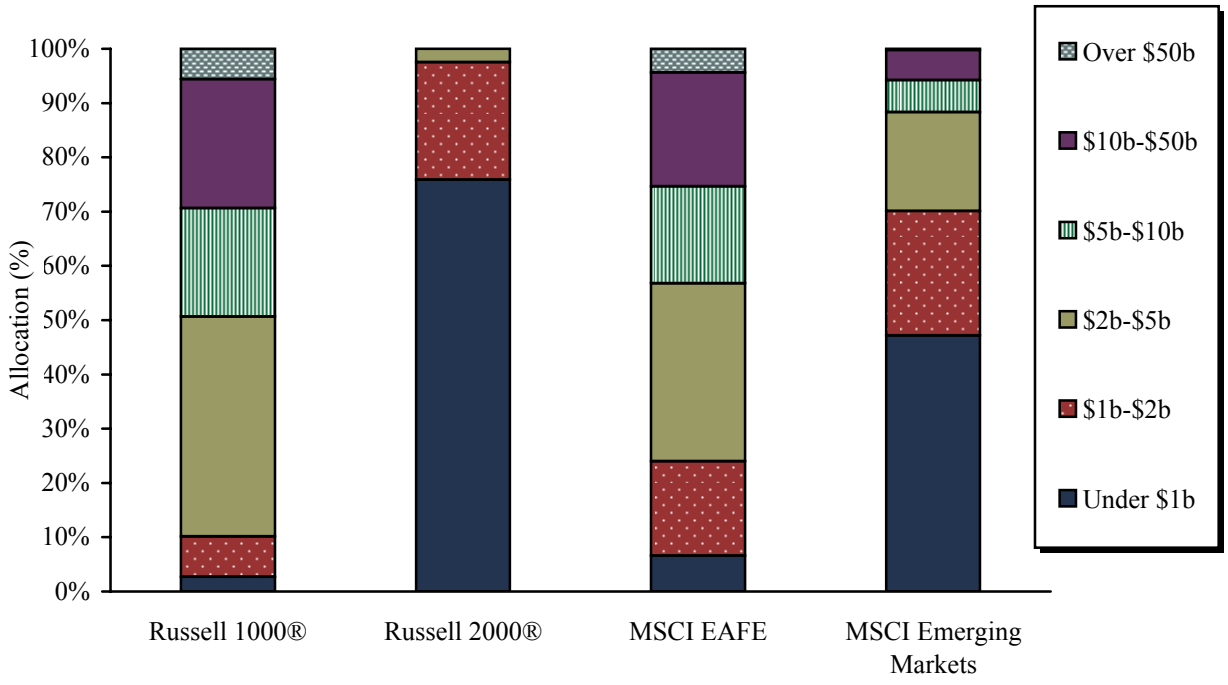

| Market Capitalization (%) | | | | |
|---|---|---|---|---|
| Over $50b | 45.9% | 0.0% | 36.9% | 7.8% |
| $10b-$50b | 34.2% | 0.0% | 39.0% | 37.5% |
| $5b-$10b | 9.7% | 0.0% | 11.7% | 14.6% |
| $2b-$5b | 9.2% | 8.2% | 9.6% | 20.2% |
| $1b-$2b | 0.8% | 43.1% | 2.3% | 11.4% |
| Under $1b | 0.1% | 48.7% | 0.5% | 8.4% |
| Total | 100% | 100% | 100% | 100% |

Sources: Frank Russell Company and Morgan Stanley Capital International. MSCI data provided "as is" without any expressed or implied warranties.

**Exhibit 2**

**THE BENCHMARKS:**
**WEIGHT IN INDEX BY NUMBER OF COMPANIES**

**As of December 31, 2006**




| Number of Companies | Russell 1000® (#) | Russell 1000® (%) | Russell 2000® (#) | Russell 2000® (%) | MSCI EAFE (#) | MSCI EAFE (%) | MSCI Emerging Markets (#) | MSCI Emerging Markets (%) |
|---|---|---|---|---|---|---|---|---|
| Over $50b | 55 | 6 | 0 | 0 | 51 | 4 | 2 | 0 |
| $10b-$50b | 235 | 24 | 0 | 0 | 244 | 21 | 47 | 6 |
| $5b-$10b | 197 | 20 | 0 | 0 | 208 | 18 | 50 | 6 |
| $2b-$5b | 400 | 41 | 49 | 2 | 382 | 33 | 155 | 18 |
| $1b-$2b | 73 | 7 | 426 | 22 | 202 | 17 | 195 | 23 |
| Under $1b | 27 | 3 | 1,497 | 76 | 77 | 7 | 401 | 47 |
| Total | 987 | 100 | 1,972 | 100 | 1,164 | 100 | 850 | 100 |

Sources: Frank Russell Company and Morgan Stanley Capital International. MSCI data provided "as is" without any expressed or implied warranties.

**Exhibit 3**

## "THE MAJORITY OF ACTIVE MANAGERS HAVE BEATEN THE S&P 500 INDEX WHEN THE LARGEST COMPANIES HAVE UNDERPERFORMED THE AVERAGE COMPANY…"

| | Total Return (%) | | | Minus | Value-Added |
|---|---|---|---|---|---|
| Year | Cap-Weighted S&P 500 | Equal-Weighted S&P 500 | Median Mid-/Large-Cap Manager | Equal-Weighted (%) | vs S&P 500 (%) |
| 1985 | 31.6 | 31.8 | 32.0 | -0.2 | 0.4 |
| 1986 | 18.6 | 19.3 | 19.0 | -0.7 | 0.5 |
| 1987 | 5.1 | 8.0 | 5.3 | -2.9 | 0.2 |
| 2005 | 4.9 | 8.1 | 8.1 | -3.1 | 3.2 |
| 2002 | -22.1 | -18.2 | -20.6 | -3.9 | 1.5 |
| 1991 | 30.5 | 35.5 | 33.6 | -5.0 | 3.1 |
| 1993 | 10.1 | 15.1 | 13.1 | -5.0 | 3.0 |
| 1988 | 16.6 | 21.6 | 17.1 | -5.1 | 0.6 |
| 2004 | 10.9 | 17.0 | 13.1 | -6.1 | 2.2 |
| 1992 | 7.6 | 15.6 | 9.2 | -8.0 | 1.6 |
| 1982 | 21.4 | 29.8 | 27.0 | -8.3 | 5.5 |
| 1983 | 22.4 | 32.0 | 23.6 | -9.6 | 1.2 |
| 1981 | -5.0 | 5.6 | 4.6 | -10.6 | 9.6 |
| 2001 | -11.9 | -0.4 | -9.4 | -11.5 | 2.5 |
| 2003 | 28.7 | 41.0 | 30.5 | -12.3 | 1.8 |
| 2000 | -9.1 | 9.6 | 0.9 | -18.7 | 10.0 |
| **Mean** | **10.0** | **17.0** | **12.9** | **-7.0** | **2.9** |

## "…AND LAGGED THE S&P 500 INDEX WHEN THE LARGEST COMPANIES HAVE OUTPERFORMED THE AVERAGE COMPANY."

| | Total Return (%) | | | Cap-Weighted Minus | Manager Value Lost |
|---|---|---|---|---|---|
| Year | Cap-Weighted S&P 500 | Equal-Weighted S&P 500 | Median Mid-/Large-Cap Manager | Equal-Weighted (%) | vs S&P 500 (%) |
| 1998 | 28.6 | 12.2 | 20.8 | 16.4 | -7.8 |
| 1999 | 21.0 | 12.0 | 19.0 | 9.0 | -2.0 |
| 1990 | -3.1 | -11.9 | -2.0 | 8.8 | 1.1 |
| 1995 | 37.6 | 32.0 | 34.6 | 5.5 | -3.0 |
| 1989 | 31.7 | 26.9 | 28.8 | 4.8 | -2.8 |
| 1997 | 33.4 | 29.0 | 31.0 | 4.3 | -2.4 |
| 1996 | 23.0 | 19.0 | 22.7 | 3.9 | -0.3 |
| 1984 | 6.1 | 3.9 | 6.4 | 2.2 | 0.3 |
| 1980 | 32.3 | 31.2 | 31.0 | 1.0 | -1.3 |
| 1994 | 1.3 | 1.0 | 0.4 | 0.4 | -0.9 |
| 2006 | 15.8 | 15.8 | 14.6 | 0.0 | -1.2 |
| **Mean** | **20.7** | **15.6** | **18.8** | **5.1** | **-1.8** |

Sources: Cambridge Associates LLC Investment Manager Database, Standard & Poor's, and Wilshire Associates, Inc.

Notes: Manager performance statistics are based primarily on gross-of-fees returns. Data for 2006 are through December 31.

**Exhibit 4**

## THE MAJORITY OF SMALL-CAP ACTIVE MANAGERS OUTPERFORM THE RUSSELL 2000® WHEN MID-CAP COMPANIES BEAT SMALL-CAP COMPANIES

| Quarter | Russell Mid-Cap® | Russell 2000® | Mid-Cap Minus 2000® | Median Manager Excess Return | % Managers Beating Index |
|---|---|---|---|---|---|
| 09/30/2000 | 6.8 | 1.1 | 5.7 | 1.5 | 67.0 |
| 03/31/2005 | -0.3 | -5.3 | 5.1 | 2.5 | 84.0 |
| 03/31/1999 | -0.5 | -5.4 | 5.0 | -1.1 | 43.7 |
| 09/30/2002 | -17.6 | -21.4 | 3.8 | 2.4 | 69.7 |
| 12/31/2000 | -3.6 | -6.9 | 3.3 | 0.5 | 54.5 |
| 03/31/2000 | 10.1 | 7.1 | 3.0 | 4.4 | 68.0 |
| 09/30/2001 | -17.9 | -20.8 | 2.9 | 2.2 | 66.2 |
| 06/30/2006 | -2.6 | -5.0 | 2.4 | 0.0 | 51.3 |
| 03/31/2003 | -2.4 | -4.5 | 2.1 | 1.4 | 65.3 |
| 09/30/2004 | -0.8 | -2.9 | 2.0 | 0.1 | 51.3 |
| 12/31/2002 | 7.9 | 6.2 | 1.8 | -0.6 | 43.3 |
| **Mean** | **-1.9** | **-5.3** | **3.4** | **1.2** | **60.4** |
| | | | | | |
| 09/30/2006 | 2.1 | 0.4 | 1.7 | -1.2 | 32.7 |
| 09/30/2005 | 5.9 | 4.7 | 1.2 | 0.9 | 67.3 |
| 12/31/2005 | 2.3 | 1.1 | 1.2 | 0.5 | 58.5 |
| 06/30/2004 | 1.4 | 0.5 | 1.0 | 0.6 | 59.8 |
| 03/31/2002 | 4.2 | 4.0 | 0.3 | 0.4 | 53.7 |
| 06/30/2005 | 4.2 | 4.3 | -0.1 | -0.6 | 39.3 |
| 12/31/2004 | 13.7 | 14.1 | -0.4 | -0.4 | 41.8 |
| 12/31/2003 | 14.0 | 14.5 | -0.6 | -0.3 | 45.8 |
| 06/30/2000 | -4.5 | -3.8 | -0.7 | 1.0 | 58.1 |
| 03/31/2004 | 5.1 | 6.3 | -1.1 | -0.5 | 40.2 |
| **Mean** | **4.9** | **4.6** | **0.2** | **0.0** | **49.7** |
| | | | | | |
| 06/30/2002 | -9.5 | -8.4 | -1.2 | 0.5 | 52.6 |
| 12/31/1999 | 17.2 | 18.4 | -1.2 | 3.1 | 58.7 |
| 12/31/2006 | 7.7 | 8.9 | -1.2 | -0.6 | 36.6 |
| 09/30/1999 | -8.6 | -6.3 | -2.3 | 2.3 | 70.4 |
| 09/30/2003 | 6.4 | 9.1 | -2.6 | -0.6 | 42.5 |
| 12/31/2001 | 17.2 | 21.1 | -3.9 | -0.3 | 46.6 |
| 03/31/2001 | -10.5 | -6.5 | -4.0 | -1.2 | 43.9 |
| 06/30/1999 | 10.9 | 15.6 | -4.7 | 1.1 | 60.3 |
| 06/30/2001 | 9.5 | 14.3 | -4.8 | 0.5 | 54.0 |
| 06/30/2003 | 18.3 | 23.4 | -5.2 | -1.9 | 37.0 |
| 03/31/2006 | 7.6 | 13.9 | -6.3 | -2.0 | 27.2 |
| **Mean** | **6.0** | **9.4** | **-3.4** | **0.1** | **48.2** |

Sources: Cambridge Associates LLC Investment Manager Database, Frank Russell Company, and Thomson Datastream.

Note: Manager returns are gross of fees.

## Exhibit 5

## SINCE 1999, THE MAJORITY OF ACTIVE GLOBAL EX U.S. MANAGERS OUTPERFORM WHEN THE MSCI EMERGING MARKETS INDEX BEATS THE MSCI EAFE INDEX

| Quarter | MSCI EAFE | MSCI Emerging Markets | Emerging Mkts Minus EAFE | Median Manager Excess Return | % Managers Beating Index |
|---|---|---|---|---|---|
| 06/30/1999 | 2.5 | 24.4 | 21.9 | 3.4 | 88.8 |
| 12/31/2001 | 7.0 | 26.6 | 19.6 | 0.6 | 57.8 |
| 03/31/1999 | 1.4 | 12.4 | 11.0 | 0.9 | 60.8 |
| 03/31/2002 | 0.5 | 11.4 | 10.9 | 1.5 | 77.8 |
| 09/30/2004 | -0.3 | 8.3 | 8.5 | 0.5 | 60.1 |
| 12/31/1999 | 17.0 | 25.4 | 8.5 | 3.3 | 69.6 |
| 03/31/2001 | -13.7 | -5.4 | 8.3 | 1.2 | 63.9 |
| 09/30/2005 | 10.4 | 18.1 | 7.7 | 0.6 | 65.6 |
| 12/31/2006 | 10.4 | 17.6 | 7.3 | 0.2 | 56.5 |
| 09/30/2003 | 8.1 | 14.2 | 6.1 | -0.2 | 46.7 |
| 03/31/2004 | 4.3 | 9.7 | 5.4 | 0.4 | 61.7 |
| **Mean** | **4.3** | **14.8** | **10.5** | **1.1** | **64.5** |
| 06/30/2005 | -1.0 | 4.2 | 5.2 | 0.6 | 75.9 |
| 06/30/2001 | -1.0 | 4.0 | 5.1 | 2.0 | 81.6 |
| 06/30/2003 | 19.3 | 23.4 | 4.1 | -0.2 | 47.3 |
| 12/31/2002 | 6.5 | 10.0 | 3.6 | -0.3 | 43.1 |
| 09/30/2002 | -19.7 | -16.3 | 3.4 | 0.3 | 57.5 |
| 12/31/2005 | 4.1 | 7.2 | 3.1 | 0.5 | 59.5 |
| 03/31/2006 | 9.4 | 12.1 | 2.7 | 0.4 | 60.2 |
| 03/31/2000 | -0.1 | 2.4 | 2.5 | 0.8 | 61.6 |
| 03/31/2003 | -8.2 | -5.9 | 2.3 | 0.1 | 54.4 |
| 03/31/2005 | -0.2 | 1.9 | 2.1 | 0.5 | 63.6 |
| **Mean** | **0.9** | **4.3** | **3.4** | **0.5** | **60.5** |
| 12/31/2004 | 15.3 | 17.3 | 1.9 | -0.7 | 29.5 |
| 09/30/2006 | 3.9 | 5.0 | 1.1 | 0.2 | 59.1 |
| 12/31/2003 | 17.1 | 17.8 | 0.7 | -0.7 | 34.3 |
| 09/30/2000 | -8.1 | -13.0 | -4.9 | 1.1 | 63.7 |
| 06/30/2006 | 0.7 | -4.3 | -5.0 | -0.6 | 33.9 |
| 06/30/2000 | -4.0 | -10.2 | -6.2 | 0.2 | 54.8 |
| 06/30/2002 | -2.1 | -8.4 | -6.3 | 0.1 | 52.3 |
| 09/30/2001 | -14.0 | -21.6 | -7.6 | -0.3 | 45.6 |
| 09/30/1999 | 4.4 | -5.2 | -9.5 | 0.0 | 51.2 |
| 06/30/2004 | 0.2 | -9.6 | -9.8 | -0.3 | 41.5 |
| 12/31/2000 | -2.7 | -13.3 | -10.6 | -0.3 | 45.9 |
| **Mean** | **1.0** | **-4.1** | **-5.1** | **-0.1** | **46.5** |

Sources: Cambridge Associates LLC Investment Manager Database, Morgan Stanley Capital International, and Thomson Datastream. MSCI data provided "as is" without any expressed or implied warranties.

Note: Manager returns are gross of fees.

# Appendix A

# DATA AND METHODOLOGY

## Database Biases

All manager databases suffer from survivorship bias. The magnitude of this problem is illustrated in the table below, comparing the number of managers in the database at the beginning of 1999 with those remaining in the database at the end of December 2006. For example, 70% of the 147 global ex U.S. equity managers in the database at the beginning of 1999 were inactive by December 2006. A reasonable assumption is that most of them had performance problems, so the eight-year return looking back today at the survivors will be higher than the actual return earned from investing across the managers available in 1999.

**Tracking the Managers in the Database on January 1, 1999**

| | U.S. Mid- to Large-Cap | U.S. Small-Cap | Global ex U.S. | Emerging Markets |
|---|---|---|---|---|
| # of Managers on 1/1/1999 | 630 | 312 | 147 | 64 |
| # Dropping out by 12/31/2006 | 342 | 136 | 70 | 27 |
| % Managers Dropping Out | 54 | 44 | 48 | 42 |

A second database problem, unique to institutional databases, is the "add-in" bias. Each year a large number of managers are added, and their prior performance is backfilled into the database. These products generally have good prior performance, or else the manager would not be submitting data. For example, a manager may "incubate" a product using in-house money and perhaps that of a small number of clients with longstanding investments in other products the firm manages. After a few years, the product is quietly shut down if performance is poor, or introduced to institutional databases if performance is strong. For example, while our database had 312 small-cap managers at the beginning of 1999 that remained in our database throughout the year, our current database has 1999 returns for 584 small-cap managers. In other words, almost one-half of managers with 1999 returns were not in our database in 1999.

## Methodology

To adjust for these biases, we examined the performance of active managers in our database on a year-by-year basis from 1999 to 2006, using only managers in the database at the beginning of the year. We also only included managers with $50 million in assets at the beginning of the year, as most institutional investors will not invest with managers with fewer assets, and because survivorship bias is enormous among tiny managers.

This approach completely eliminates the add-in bias. For example, a manager entering our database in the middle of 2004, with three years of returns that are backfilled into the database, would only be included in the 2005 and 2006 study. A year-by-year analysis also substantially reduces the influence of survivorship bias, as returns for managers dropping from the database are included in every year except the year in which we no longer have returns. A small portion of the managers in the database at the beginning of each year became inactive during the year, either liquidating or choosing not to continue participating in the

database. However, a reasonable assumption is that the majority of managers that became inactive had poor performance, so the reported percentage of managers outperforming the market is likely overstated, with the true median lower than that reported. Since the percentage of managers dropping out each year averaged 3% to 7% across the asset classes, the "true" median may be closer to the reported 55th percentile among the survivors.

We tested for manager selection skill during this period by comparing the equal-weighted manager excess return (i.e., the expected return from a random selection of managers) to the asset-weighted excess return to determine if the return to the average dollar invested exceeded the expected return from randomly selecting managers. In a related test, we compared the performance of the ten managers with the most assets at the beginning of each year with the rest of the manager universe to determine if the most popular managers beat the expected return from randomly selecting managers.

We also tracked the performance of the class of 1999 through the end of 2006, providing statistics for those managers in our database at the beginning of 1999 with assets over $50 million that survived the entire eight years.

**Benchmarks Used**

For the purpose of comparing active managers to passive alternatives, we used the following benchmarks:

- U.S. Mid- to Large-Cap Equities: diverse and opportunistic managers were measured against the Russell 1000® Index, and growth and value managers were measured against the Russell 1000® Growth Index and Russell 1000® Value Index, respectively.
- U.S. Small-Cap Equities: diverse and opportunistic managers were measured against the Russell 2000® Index, and growth and value managers were measured against the Russell 2000® Growth Index and Russell 2000® Value Index, respectively.
- Global ex U.S. developed markets: MSCI EAFE Index.
- Emerging Markets: MSCI Emerging Markets Index.

**Appendix B**

# OVERVIEW OF PERFORMANCE OF ACTIVE MANAGERS RELATIVE TO PASSIVE BENCHMARKS

**1999-2006**

**U.S. Mid- to Large-Cap Equities:** The percentage of managers beating the relevant style index[1] net of fees ranged from 27% to 69% in each year, averaging 48%. Value added from active managers was realized when mid-cap stocks beat large-cap stocks—as active management in the aggregate is primarily a bet on mid-cap companies—and when cash beats stocks. Smaller managers generally beat larger managers, illustrating that investors in the aggregate had no manager selection skill during this period. For example, the ten largest managers at the beginning of each year added no value on average, even before fees.

**U.S. Small-Cap Equities:** The percentage of managers beating the relevant style index[2] net of fees ranged from 16% to 72%, averaging 49%. However, the equal-weighted excess return was positive in five of eight years, averaging 250 bps before fees, although with an enormous distribution of excess returns among managers. Active managers performed best when mid-cap stocks beat small-cap stocks, which would be expected since small-cap managers tend to underweight the smallest companies. Smaller managers beat larger managers in five out of the eight years, with the ten largest managers at the beginning of each year lagging their benchmark on average and generating an equal-weighted excess return that averaged -80 bps before fees.

**Global ex U.S. Developed Markets:** The percentage of managers beating their index net of fees ranged from 38% to 78%, averaging 51%. The equal-weighted and asset-weighted excess return each averaged about 270 bps and 290 bps, respectively, before fees, driven mostly by spectacular outperformance in 1999. Active managers performed best when emerging markets beat developed markets, Canada (which is not in the MSCI EAFE Index) beat the MSCI EAFE Index, and small-cap stocks beat large-cap stocks. All three of these non-benchmark bets worked during this period, making manager outperformance greater than we would expect going forward. This was the only asset class in which the largest managers did not lag the rest of the manager universe, suggesting the value added from additional resources may have offset any negative problems created by asset size during this period.

**Emerging Markets:** The percentage of managers beating the relevant index net of fees ranged from 44% to 61%, averaging 54%. The asset-weighted excess return averaged only 120 bps before fees, suggesting this asset class is more efficient than many investors believe. In fact, the 55th percentile added no value, on average, after fees. The equal-weighted excess return beat the asset-weighted excess return in six of the eight years, suggesting significant assets may be a problem.

[1] Diverse and opportunistic managers were measured against the Russell 1000® Index, and growth and value managers were measured against the Russell 1000® Growth Index and Russell 1000® Value Index, respectively.
[2] Diverse and opportunistic managers were measured against the Russell 2000® Index, and growth and value managers were measured against the Russell 2000® Growth Index and Russell 2000® Value Index, respectively.

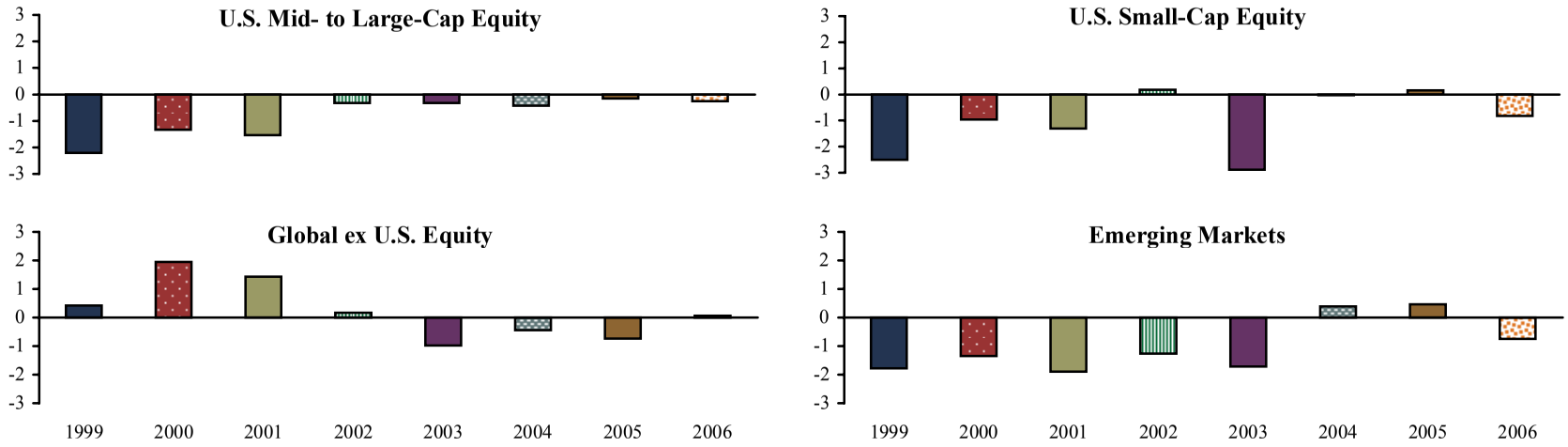
**Class of 1999:** We also tracked managers in our database at the start of 1999 with assets over $50 million that survived through the end of 2006. About one-third to one-half of the managers disappeared over eight years, and about two-thirds of the survivors outperformed their relevant benchmark after fees. Assuming a worst-case scenario in which all managers dropping from the database underperformed the benchmark, the percentage of the original managers outperforming gross of fees ranged from 31% to 48%. The equal-weighted gross excess returns differed substantially across survivors, ranging from 220 bps in U.S. mid- to large-cap equity and 310 bps in global ex U.S. equity.

## Appendix B-1

## IN THE AGGREGATE, DID INVESTORS EXHIBIT MANAGER SELECTION SKILL?

### 1999-2006

**Dollar-Weighted Excess Return Less Equal-Weighted Manager Excess Return**




With the exception of global ex U.S. equity, the average dollar invested generally lagged the return from randomly selecting managers.

Sources: Cambridge Associates LLC Investment Manager Database, Dow Jones & Company, Inc., Frank Russell Company, Morgan Stanley Capital International, and Thomson Datastream. MSCI data provided "as is" without any expressed or implied warranties.

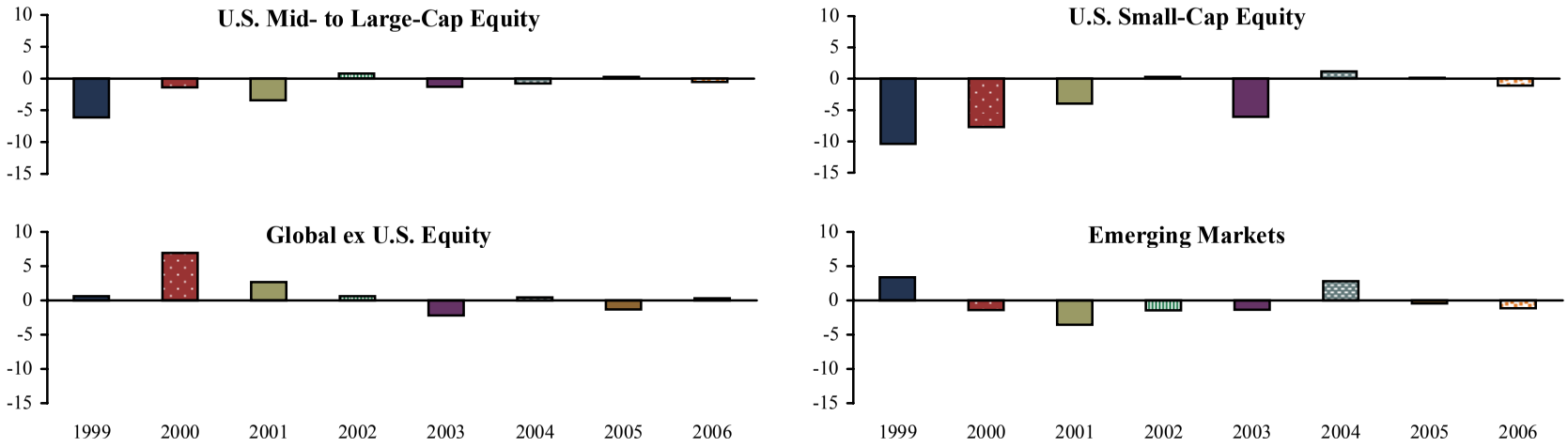
Notes: All calculations are done on a gross of fees basis. Year-by-year returns include only managers that were in the database at the beginning of the year, with product assets greater than $50 million. This approach avoids an "add-in" bias. Managers for whom asset data were unavailable were excluded, as many likely had assets under $50 million. Excess returns ignore managers dropping from the database during the year, creating a small amount of survivorship bias.

## Appendix B-2

## IN THE AGGREGATE, DID INVESTORS EXHIBIT MANAGER SELECTION SKILL?

### 1999-2006

**Ten-Largest Managers Less Rest of Manager Universe (Equal-Weighted)**




With the exception of global ex U.S. equity, the ten largest managers generally lagged the rest of the manager universe.

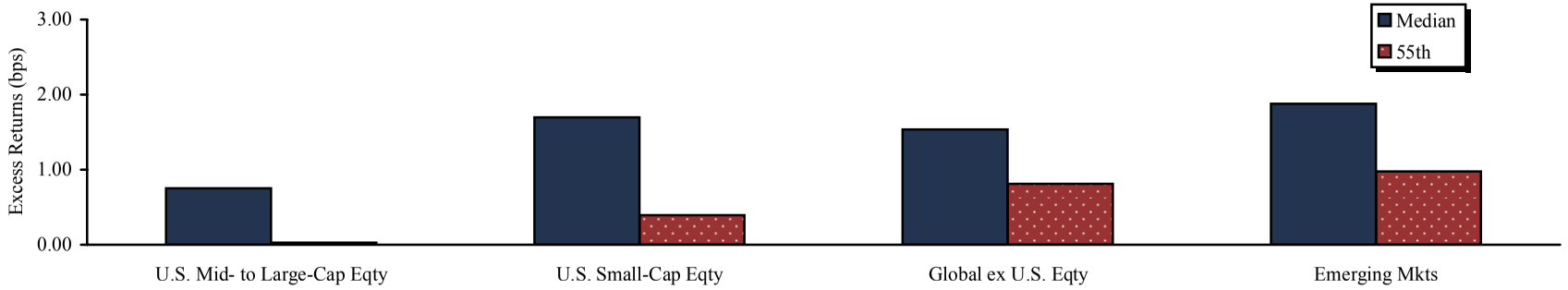
Sources: Cambridge Associates LLC Investment Manager Database, Dow Jones & Company, Inc., Frank Russell Company, Morgan Stanley Capital International, and Thomson Datastream. MSCI data provided "as is" without any expressed or implied warranties.

Notes: All calculations are done on a gross of fees basis. Year-by-year returns include only managers that were in the database at the beginning of the year, with product assets greater than $50 million. This approach avoids an "add-in" bias. Managers for whom asset data were unavailable were excluded, as many likely had assets under $50 million. Excess returns ignore managers dropping from the database during the year, creating a small amount of survivorship bias.

## Appendix B-3

## MEDIAN MANAGER PERFORMANCE RELATIVE TO BENCHMARK

## 1999-2006




### Annual Breakdown

| | U.S. Mid- to Large-Cap Equity | | U.S. Small-Cap Equity | | Global ex U.S. Equity | | Emerging Markets | |
|---|---|---|---|---|---|---|---|---|
| | Median | 55th | Median | 55th | Median | 55th | Median | 55th |
| 1999 | -1.2 | -2.7 | 5.8 | 3.1 | 9.3 | 8.0 | 5.8 | 2.6 |
| 2000 | 6.0 | 4.7 | 7.7 | 5.5 | -0.1 | -0.7 | 2.1 | 1.3 |
| 2001 | 2.6 | 2.0 | 1.2 | -0.2 | 2.1 | 0.8 | 0.5 | 0.3 |
| 2002 | -0.1 | -0.6 | 2.4 | 1.2 | 1.5 | 1.1 | 2.6 | 2.0 |
| 2003 | -0.6 | -1.2 | -2.5 | -3.7 | -2.3 | -2.9 | 1.7 | 1.3 |
| 2004 | 0.3 | 0.0 | -0.6 | -1.3 | -0.6 | -1.0 | 0.1 | -1.2 |
| 2005 | 0.7 | 0.2 | 3.4 | 2.9 | 2.4 | 1.9 | 2.1 | 1.8 |
| 2006 | -1.8 | -2.4 | -3.8 | -4.3 | 0.0 | -0.6 | 0.1 | -0.3 |
| **Average** | **0.8** | **0.0** | **1.7** | **0.4** | **1.5** | **0.8** | **1.9** | **1.0** |

Sources: Cambridge Associates LLC Investment Manager Database, Dow Jones & Company, Inc., Frank Russell Company, Morgan Stanley Capital International, and Thomson Datastream. MSCI data provided "as is" without any expressed or implied warranties.

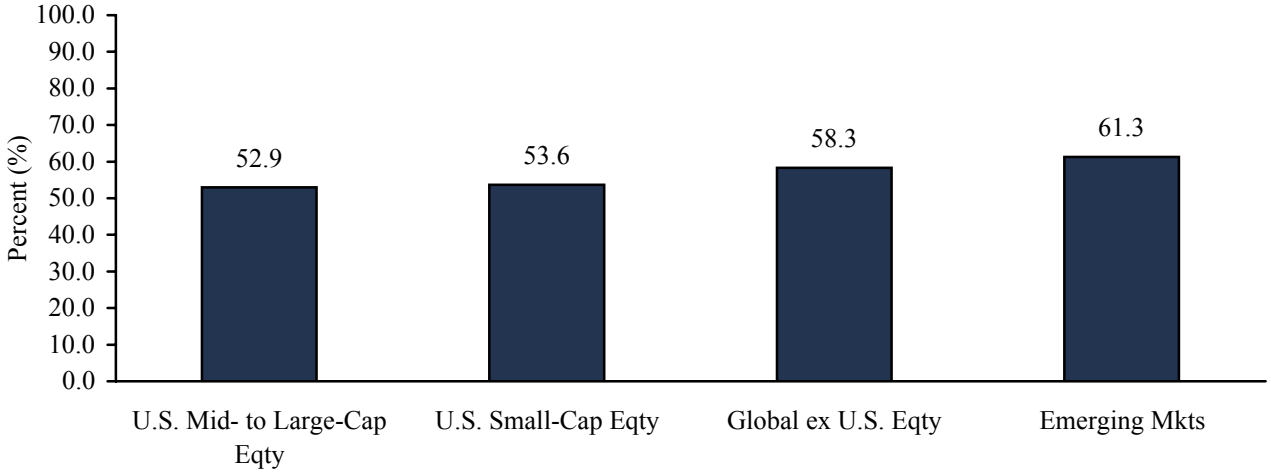
Notes: All calculations are done on a gross of fees basis. Year-by-year returns include only managers that were in the database at the beginning of the year, with product assets greater than $50 million. This approach avoids an "add-in" bias. Managers for whom asset data were unavailable were excluded, as many likely had assets under $50 million. Excess returns ignore managers dropping from the database during the year, creating a small amount of survivorship bias. The "true median" is likely between the reported median and 55th percentile.

## Appendix B-4

## HAVE THE MAJORITY OF MANAGERS OUTPERFORMED THEIR BENCHMARK GROSS OF FEES?

### 1999-2006

**Average Percentage of Managers Outperforming Benchmark**




**Annual Breakdown (%)**

| | U.S. Mid- to Large-Cap Equity | U.S. Small-Cap Equity | Global ex U.S. Equity | Emerging Markets |
|---|---|---|---|---|
| 1999 | 44.3 | 63.6 | 82.4 | 63.0 |
| 2000 | 71.2 | 67.0 | 49.3 | 59.0 |
| 2001 | 67.2 | 54.6 | 61.9 | 58.3 |
| 2002 | 48.8 | 60.9 | 62.1 | 73.2 |
| 2003 | 46.4 | 36.5 | 40.2 | 61.7 |
| 2004 | 55.3 | 45.6 | 44.8 | 51.5 |
| 2005 | 57.7 | 78.2 | 75.9 | 64.1 |
| 2006 | 32.6 | 22.4 | 50.0 | 59.7 |
| **Average** | **52.9** | **53.6** | **58.3** | **61.3** |

Sources: Cambridge Associates LLC Investment Manager Database, Dow Jones & Company, Inc., Frank Russell Company, Morgan Stanley Capital International, and Thomson Datastream. MSCI data provided "as is" without any expressed or implied warranties.

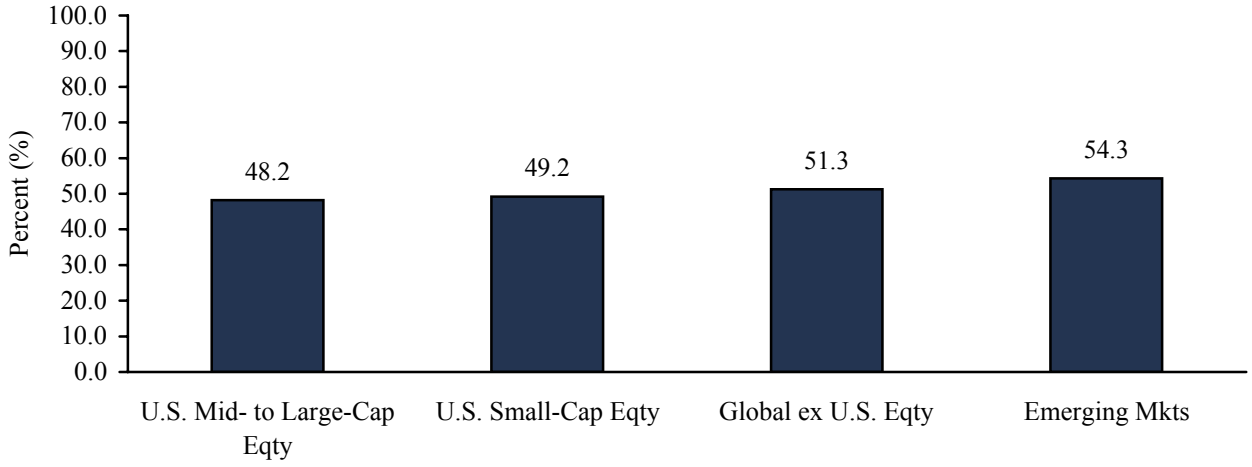
Notes: Year-by-year returns include only managers that were in the database at the beginning of the year, with product assets greater than $50 million. This approach avoids an "add-in" bias. Managers for whom asset data were unavailable were excluded, as many likely had assets under $50 million. Excess returns ignore managers dropping from the database during the year, creating a small amount of survivorship bias.

## Appendix B-5

## HAVE THE MAJORITY OF MANAGERS OUTPERFORMED THEIR BENCHMARK NET OF FEES?

### 1999-2006

**Average Percentage of Managers Outperforming Benchmark**




**Annual Breakdown (%)**

| | U.S. Mid- to Large-Cap Equity | U.S. Small-Cap Equity | Global ex U.S. Equity | Emerging Markets |
|---|---|---|---|---|
| 1999 | 42.8 | 60.3 | 78.4 | 59.3 |
| 2000 | 68.8 | 65.0 | 45.2 | 55.7 |
| 2001 | 64.2 | 50.1 | 53.7 | 46.7 |
| 2002 | 43.9 | 56.2 | 55.6 | 60.7 |
| 2003 | 41.8 | 33.7 | 34.9 | 58.3 |
| 2004 | 46.8 | 40.0 | 38.3 | 44.1 |
| 2005 | 50.8 | 71.6 | 65.6 | 60.9 |
| 2006 | 26.5 | 16.4 | 38.7 | 48.4 |
| **Average** | **48.2** | **49.2** | **51.3** | **54.3** |

Sources: Cambridge Associates LLC Investment Manager Database, Dow Jones & Company, Inc., Frank Russell Company, Morgan Stanley Capital International, and Thomson Datastream. MSCI data provided "as is" without any expressed or implied warranties.

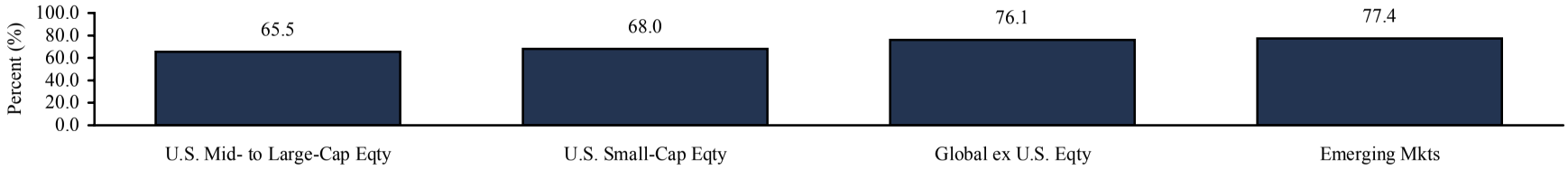
Notes: Year-by-year returns include only managers that were in the database at the beginning of the year, with product assets greater than $50 million. This approach avoids an "add-in" bias. Managers for whom asset data were unavailable were excluded, as many likely had assets under $50 million. Excess returns ignore managers dropping from the database during the year, creating a small amount of survivorship bias. The "true median" is likely between the reported median and 55th percentile. We assume fees of 60 bps for U.S. Mid- to Large-Cap and 100 bps for the others as these are representative of the typical fees paid by our clients for active management.

## Appendix B-6

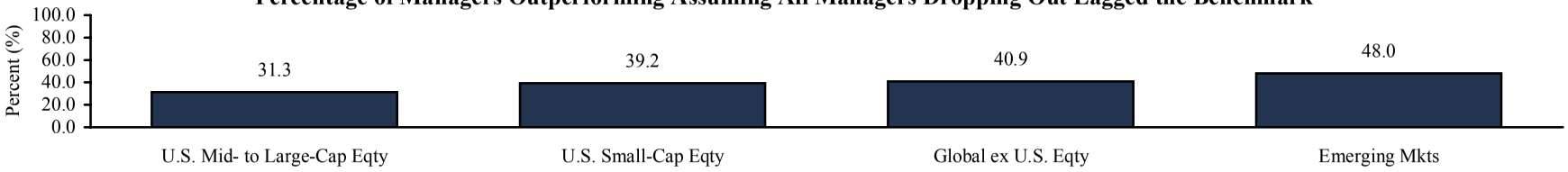
## PERFORMANCE OF THE CLASS OF 1999

## 1999-2006

**Percentage of Surviving Managers Outperforming Net of Fees**




**Percentage of Managers Outperforming Assuming All Managers Dropping Out Lagged the Benchmark**




**Tracking the Managers in the Database on 1/1/1999**

| | U.S. Mid- to Large-Cap Equity | U.S. Small-Cap Equity | Global ex U.S. Equity | Emerging Markets |
|---|---|---|---|---|
| Managers on 1/1/99 (Assets >$50 Mil) | 552 | 260 | 132 | 50 |
| Managers Dropping Out by 12/31/2006 | 288 | 110 | 61 | 19 |
| % of Managers Dropping Out by 12/31/2006 | 52.2 | 42.3 | 46.2 | 38.0 |
| Equal-Wtd Annualized Gross Excess Returns of Survivors (8-Yr AACR) | 2.2 | 3.0 | 3.1 | 2.5 |

Sources: Cambridge Associates LLC Investment Manager Database, Dow Jones & Company, Inc., Frank Russell Company, Morgan Stanley Capital International, and Thomson Datastream. MSCI data provided "as is" without any expressed or implied warranties.

Notes: All calculations done on a net of fees basis. We assume fees of 60 bps for U.S. Mid- to Large-Cap Equity and 100 bps for the others as these are representative of the typical fees paid by our clients for active management. Returns include only managers that were in the database at the beginning of 1999, with product assets greater than $50 million that survived the entire five years. This approach avoids an "add-in" bias. Managers for whom asset data were unavailable were excluded, as many likely had assets under $50 million.

**Appendix C**

**DETAILED COMPARISON BY ASSET CLASSES OF THE PERFORMANCE OF ACTIVE MANAGERS RELATIVE TO PASSIVE BENCHMARKS**

**1999-2006**

## MANAGER UNIVERSE CHARACTERISTICS

- The investment management industry is extremely concentrated. The ten largest products make up 28% of total U.S. mid- to large-cap equity assets, 16% of total U.S. small-cap assets, 37% of total global ex U.S. equity assets, and a whopping 58% of total emerging markets assets. The largest quartile of managers make up 69% to 85% of total assets.

- At the other extreme, the smallest quartile of managers make up less than 0.5% to 3.1% of total assets in each category, with many being too small for many institutions to consider as viable investment options. Yet these managers can have an important influence on manager peer rankings.

## Appendix C-1

## CAMBRIDGE ASSOCIATES' UNIVERSES

**U.S. Mid- to Large-Cap Equity Manager Universe**

| Asset Class Characteristics (12/31/06) | | % of Total Product Assets (12/31/06) | |
|---|---|---|---|
| Total Number of Products | 650 | 10 Largest Products | 28.4 |
| Total Product Assets ($ billions) | 2,704 | Largest Quartile | 85.3 |
| Total Number of Products with Assets > $50 million | 596 | Smallest Quartile | 0.5 |

**U.S. Small-Cap Equity Manager Universe**

| Asset Class Characteristics (12/31/06) | | % of Total Product Assets (12/31/06) | |
|---|---|---|---|
| Total Number of Products | 533 | 10 Largest Products | 15.9 |
| Total Product Assets ($ billions) | 525 | Largest Quartile | 68.8 |
| Total Number of Products with Assets > $50 million | 457 | Smallest Quartile | 1.3 |

**Global ex U.S. Equity Manager Universe**

| Asset Class Characteristics (12/31/06) | | % of Total Product Assets (12/31/06) | |
|---|---|---|---|
| Total Number of Products | 164 | 10 Largest Products | 37.2 |
| Total Product Assets ($ billions) | 1,039 | Largest Quartile | 75.9 |
| Total Number of Products with Assets > $50 million | 155 | Smallest Quartile | 1.0 |

**Emerging Markets Manager Universe**

| Asset Class Characteristics (12/31/06) | | % of Total Product Assets (12/31/06) | |
|---|---|---|---|
| Total Number of Products | 60 | 10 Largest Products | 57.7 |
| Total Product Assets ($ billions) | 205 | Largest Quartile | 72.2 |
| Total Number of Products with Assets > $50 million | 54 | Smallest Quartile | 3.1 |

Source: Cambridge Associates LLC Investment Manager Database.

Notes: Includes only managers that were in the database at the beginning of the year, with product assets greater than $50 million. This approach avoids an "add-in" bias. Managers for whom asset data were unavailable were excluded, as many likely had assets under $50 million.

## U.S. MID- TO LARGE-CAP EQUITY MANAGERS

### Performance Relative to Relevant Russell 1000® Indices[1]

- The takeaway from the data is mixed, with something for everyone. The majority of managers underperformed net of fees in five of the eight years, but the level of outperformance was so high in 2000 and 2001 that the equal-weighted manager excess return was positive for the full period, averaging 160 bps a year, gross of fees. The average dollar invested fared worse, as the asset-weighted excess return averaged 80 bps a year, gross of fees.

- Equal-weighted returns outpaced asset-weighted returns in each of the eight years, indicating that smaller managers generally beat larger managers. The ten largest managers at the beginning of each year added no value on average, with an equal-weighted excess return of only 10 bps before fees.

- Investors demonstrated no manager selection skill in the aggregate during this period. For example, the ten largest managers, as a proxy for the most popular managers, lagged the rest of the universe by 150 bps a year on average, and underperformed the indices after fees.

[1] Diverse and opportunistic managers were measured against the Russell 1000® Index, and growth and value managers were measured against the Russell 1000® Growth Index and Russell 1000® Value Index, respectively.

## Appendix C-2

## CAMBRIDGE ASSOCIATES' U.S. MID- TO LARGE-CAP EQUITY MANAGER UNIVERSE

### Year-by-Year Analysis: Excess Return (Gross) Statistics
### January 1, 1999 through December 31, 2006

| Excess Return vs Russell 1000® Style Indices | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | Average |
|---|---|---|---|---|---|---|---|---|---|
| Equal-Weighted Excess Return (%) | 1.7 | 7.3 | 3.3 | 0.0 | 0.4 | 0.7 | 1.2 | -1.9 | 1.6 |
| Asset-Weighted Excess Return (%) | -0.5 | 5.9 | 1.8 | -0.3 | 0.1 | 0.3 | 1.0 | -2.2 | 0.8 |
| Median Excess Return (%) | -1.2 | 6.0 | 2.6 | -0.1 | -0.6 | 0.3 | 0.7 | -1.8 | 0.8 |
| 55th Percentile (%) | -2.7 | 4.7 | 2.0 | -0.6 | -1.2 | 0.0 | 0.2 | -2.4 | 0.0 |
| Spread Between 5th and 95th Percentile | 53.3 | 39.1 | 27.8 | 21.2 | 22.0 | 16.1 | 14.6 | 14.7 | 26.1 |
| % of Managers with Positive Excess Gross Return | 44.3 | 71.2 | 67.2 | 48.8 | 46.4 | 55.3 | 57.7 | 32.6 | 52.9 |
| % of Managers with Outperformance > 60 bps | 42.8 | 68.8 | 64.2 | 43.9 | 41.8 | 46.8 | 50.8 | 26.5 | 48.2 |

### Comparison of Largest Managers to Rest of Universe

| % Outperforming by > 60 bps | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | Average |
|---|---|---|---|---|---|---|---|---|---|
| 10 Largest Managers | 30.0 | 80.0 | 40.0 | 50.0 | 50.0 | 40.0 | 60.0 | 20.0 | 46.3 |
| Rest of Universe | 43.0 | 68.6 | 64.6 | 43.8 | 41.7 | 46.9 | 50.6 | 26.6 | 48.2 |
| **Equal-Weighted Excess Return (Gross)** | | | | | | | | | |
| 10 Largest Managers | -4.3 | 5.9 | 0.0 | 0.7 | -0.8 | 0.0 | 1.4 | -2.4 | 0.1 |
| Rest of Universe | 1.8 | 7.3 | 3.4 | 0.0 | 0.5 | 0.7 | 1.2 | -1.9 | 1.6 |
| | | | | | | | | | AACR |
| Russell 1000® Index | 20.9 | -7.8 | -12.4 | -21.7 | 29.9 | 11.4 | 6.3 | 15.5 | 3.9 |
| Russell 1000® Growth Index | 33.2 | -22.4 | -20.4 | -27.9 | 29.7 | 6.3 | 5.3 | 9.1 | -0.8 |
| Russell 1000® Value Index | 7.3 | 7.0 | -5.6 | -15.5 | 30.0 | 16.5 | 7.1 | 22.2 | 7.7 |

Sources: Cambridge Associates LLC Investment Manager Database, Frank Russell Company, and Thomson Datastream.

Notes: Year-by-year returns include only managers that were in the database at the beginning of the year, with product assets greater than $50 million. This approach avoids an "add-in" bias. Managers for whom asset data were unavailable were excluded, as many likely had assets under $50 million. A small degree of survivorship bias remains, as managers dropped from the database during the year; the average number of managers dropping out during the year is 6.5%. The "true median" is likely between the reported median and 55th percentile. The ten largest managers are determined based upon product assets under management at the beginning of each year.

## U.S. SMALL-CAP EQUITY MANAGERS

### Performance Relative to Relevant Russell 2000® Indices[2]

- Equal-weighted excess returns averaged 2.5% for the period and an average of 54% of managers outperformed the benchmark annually gross of fees. While the strongest results were observed in 1999, 2000, and 2005, active managers produced positive excess returns net of fees in five out of eight years. Median excess returns for the period averaged 1.7% before fees.

- Managers with fewer assets under management substantially outperformed larger managers. Equal-weighted returns outpaced asset-weighted returns in five of the eight years, and essentially matched the asset-weighted returns in the other three years.

- The ten largest managers at the beginning of each year underperformed by 80 bps on average before fees, and lagged the rest of the manager universe by an astonishing 340 bps on average.

- In most years, the distribution of excess returns among managers was enormous. For example, the excess return gap between the 5th and 95th percentile managers in five of the eight years exceeded 20 percentage points, suggesting investors engaged in active management of small-cap stocks need to be willing to tolerate periods of significant underperformance.

- In the aggregate, investors displayed negative manager selection skill during this period, as evidenced by the underperformance of the most popular managers (i.e., the ten largest) relative to their benchmark and the average manager and by the 100-bp gap between the average manager and the average dollar.

[2] Diverse and opportunistic managers were measured against the Russell 2000® Index, and growth and value managers were measured against the Russell 2000® Growth Index and Russell 2000® Value Index, respectively.

## Appendix C-3

## CAMBRIDGE ASSOCIATES' U.S. SMALL-CAP EQUITY MANAGER UNIVERSE

### Year-by-Year Analysis: Excess Return (Gross) Statistics
### January 1, 1999 through December 31, 2006

| Excess Return vs Russell 2000® Style Indices | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | Average |
|---|---|---|---|---|---|---|---|---|---|
| Equal-Weighted Excess Return (%) | 9.2 | 8.9 | 1.6 | 1.9 | -0.8 | -0.7 | 3.7 | -3.7 | 2.5 |
| Asset-Weighted Excess Return (%) | 6.7 | 7.9 | 0.3 | 2.1 | -3.6 | -0.7 | 3.8 | -4.5 | 1.5 |
| Median Excess Return (%) | 5.8 | 7.7 | 1.2 | 2.4 | -2.5 | -0.6 | 3.4 | -3.8 | 1.7 |
| 55th Percentile (%) | 3.1 | 5.5 | -0.2 | 1.2 | -3.7 | -1.3 | 2.9 | -4.3 | 0.4 |
| Spread Between 5th and 95th Percentile | 90.1 | 61.3 | 43.0 | 27.4 | 35.2 | 19.1 | 16.6 | 17.8 | 38.8 |
| % of Managers with Positive Excess Gross Return | 63.6 | 67.0 | 54.6 | 60.9 | 36.5 | 45.6 | 78.2 | 22.4 | 53.6 |
| % of Managers with Outperformance > 100 bps | 60.3 | 65.0 | 50.1 | 56.2 | 33.7 | 40.0 | 71.6 | 16.4 | 49.2 |

### Comparison of Largest Managers to Rest of Universe

| % Outperforming by > 100 bps | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | Average |
|---|---|---|---|---|---|---|---|---|---|
| 10 Largest Managers | 60.0 | 50.0 | 40.0 | 70.0 | 20.0 | 60.0 | 80.0 | 10.0 | 48.8 |
| Rest of Universe | 60.3 | 65.5 | 50.5 | 55.8 | 34.0 | 39.5 | 71.5 | 16.6 | 49.2 |
| **Equal-Weighted Excess Return (Gross)** | | | | | | | | | |
| 10 Largest Managers | -0.8 | 1.4 | -2.2 | 2.2 | -6.7 | 0.5 | 3.8 | -4.7 | -0.8 |
| Rest of Universe | 9.6 | 9.2 | 1.7 | 1.9 | -0.6 | -0.7 | 3.6 | -3.6 | 2.6 |
| | | | | | | | | | AACR |
| Russell 2000® Index | 21.3 | -3.0 | 2.5 | -20.5 | 47.3 | 18.3 | 4.6 | 18.4 | 9.5 |
| Russell 2000® Growth Index | 43.1 | -22.4 | -9.2 | -30.3 | 48.5 | 14.3 | 4.2 | 13.3 | 4.4 |
| Russell 2000® Value Index | -1.5 | 22.8 | 14.0 | -11.4 | 46.0 | 22.2 | 4.7 | 23.5 | 13.8 |

Sources: Cambridge Associates LLC Investment Manager Database, Frank Russell Company, and Thomson Datastream.

Notes: Year-by-year returns include only managers that were in the database at the beginning of the year, with product assets greater than $50 million. This approach avoids an "add-in" bias. Managers for whom asset data were unavailable were excluded, as many likely had assets under $50 million. A small degree of survivorship bias remains, as managers dropped from the database during the year; the average number of managers dropping out during the year is 4.5%. The "true median" is likely between the reported median and 55th percentile. The ten largest managers are determined based upon product assets under management at the beginning of each year.

## GLOBAL EX U.S. EQUITY MANAGERS

### Performance Relative to the MSCI EAFE Index

- Active management has generally added value over this period, assuming the MSCI EAFE Index as the benchmark. The percentage of managers beating the index has averaged 58% a year gross of fees, with 51% outperforming by 100 bps or more. While the percentage of managers outperforming net of fees was not meaningfully different from 50%, the asset-weighted excess return and equal-weighted excess return has averaged nearly 300 bps.

- While active managers added value over this period, they did so in an environment in which all non-benchmark strategies commonly pursued by active managers—emerging markets, Canada, and small-cap stocks—outperformed the MSCI EAFE Index. Managers' outperformance relative to the MSCI All Country World ex U.S. Index was more subdued, as this index has a 15% weighting in emerging markets and a 6% weighting in Canada, which are excluded from the MSCI EAFE Index. Over this eight-year period, the MSCI EAFE Index lagged the MSCI All Country World ex U.S by 170 bps annualized.

- This was the only asset class we examined in which small managers exhibited no advantage over larger managers. These data, while limited, suggest that perhaps the ability of the large, multi-product firms to support numerous offices and analysts, and to use dedicated teams for opportunistic bets into emerging markets and Canada, offsets any liquidity or trading problems created by significant assets.

- With the excess return to the average dollar slightly exceeding the excess return to the average manager, and with the ten largest managers beating the rest of the universe on average, investors in the aggregate benefited from their manager picks.

## Appendix C-4

## CAMBRIDGE ASSOCIATES' GLOBAL EX U.S. EQUITY MANAGER UNIVERSE

### Year-by-Year Analysis: Excess Return (Gross) Statistics
### January 1, 1999 through December 31, 2006

| Excess Return vs MSCI EAFE Index | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | Average |
|---|---|---|---|---|---|---|---|---|---|
| Equal-Weighted Excess Return (%) | 13.0 | 1.7 | 2.5 | 2.3 | -1.0 | -0.2 | 3.0 | 0.1 | 2.7 |
| Asset-Weighted Excess Return (%) | 13.4 | 3.7 | 3.9 | 2.5 | -2.0 | -0.7 | 2.3 | 0.2 | 2.9 |
| Median Excess Return (%) | 9.3 | -0.1 | 2.1 | 1.5 | -2.3 | -0.6 | 2.4 | 0.0 | 1.5 |
| 55th Percentile (%) | 8.0 | -0.7 | 0.8 | 1.1 | -2.9 | -1.0 | 1.9 | -0.6 | 0.8 |
| Spread Between 5th and 95th Percentile | 51.7 | 29.2 | 18.4 | 19.2 | 24.9 | 15.2 | 14.7 | 15.2 | 23.5 |
| % of Managers with Positive Excess Gross Return | 82.4 | 49.3 | 61.9 | 62.1 | 40.2 | 44.8 | 75.9 | 50.0 | 58.3 |
| % of Managers with Outperformance > 100 bps | 78.4 | 45.2 | 53.7 | 55.6 | 34.9 | 38.3 | 65.6 | 38.7 | 51.3 |

### Comparison of Largest Managers to Rest of Universe

| % Outperforming by > 100 bps | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | Average |
|---|---|---|---|---|---|---|---|---|---|
| 10 Largest Managers | 70.0 | 80.0 | 80.0 | 50.0 | 20.0 | 40.0 | 60.0 | 40.0 | 55.0 |
| Rest of Universe | 79.1 | 42.6 | 51.8 | 55.9 | 35.8 | 38.2 | 65.9 | 38.6 | 51.0 |
| **Equal-Weighted Excess Return (Gross)** | | | | | | | | | |
| 10 Largest Managers | 13.6 | 8.2 | 5.0 | 2.9 | -3.1 | 0.2 | 1.8 | 0.4 | 3.6 |
| Rest of Universe | 13.0 | 1.3 | 2.3 | 2.3 | -0.9 | -0.2 | 3.1 | 0.1 | 2.6 |
| | | | | | | | | | AACR |
| MSCI EAFE Index | 27.0 | -14.2 | -21.4 | -15.9 | 38.6 | 20.2 | 13.5 | 26.3 | 7.0 |
| MSCI AC World ex U.S. Index | 30.9 | -15.1 | -19.5 | -14.7 | 41.4 | 21.4 | 17.1 | 27.2 | 8.7 |

Sources: Cambridge Associates LLC Investment Manager Database and Morgan Stanley Capital International. MSCI data provided "as is" without any expressed or implied warranties.

Notes: Year-by-year returns include only managers that were in the database at the beginning of the year, with product assets greater than $50 million. This approach avoids an "add-in" bias. Managers for whom asset data were unavailable were excluded, as many likely had assets under $50 million. A small degree of survivorship bias remains, as managers dropped from the database during the year; the average number of managers dropping out during the year is 4.1%. The "true median" is likely between the reported median and 55th percentile. The ten largest managers are determined based upon product assets under management at the beginning of each year.

## EMERGING MARKETS EQUITY MANAGERS

### Performance Relative to the MSCI Emerging Markets Index[3]

- The general assumption in the industry is that emerging markets is an extremely "inefficient" asset class, in which the vast majority of managers easily outperform. This is not supported by the data. The dollar-weighted excess return has averaged 120 bps annualized over the last eight years relative to the MSCI Emerging Markets Index, or virtually zero net of management fees, and has been negative if measured against the broader S&P/IFC Investable Composite Index. This suggests this asset class is perhaps not as inefficient as most investors assume.

- Smaller managers performed better, with the equal-weighted return averaging 220 bps before fees and beating the asset-weighted return in six of eight years. Examining the equal-weighted excess returns of the ten largest managers we found similar results, with the rest of the manager universe outperforming the ten largest managers in all years except 1999 and 2004. This is not surprising, given the concentration of assets controlled by the largest managers and the small-capitalization and limited trading volume of many of the companies in the emerging markets universe.

- The distribution of returns among managers was wide, with an average spread between the 5th and 95th percentile managers of 24 percentage points. The distribution was widest in years in which the index posted its strongest results, with a spread of 54 percentage points in 1999 and 29 percentage points in 2003.

- Challenging the notion that "active management adds value in a bear market," we note that emerging markets fell 31% in 2000, while the excess return to the average dollar invested was negative after fees and five of the ten largest managers underperformed after fees. This is especially disappointing considering an average cash position of even 3% would have added over 100 bps versus the index.

- Investors should have realistic expectations for active managers in this space, as about 45% of managers underperformed the MSCI Emerging Markets Index on average after fees each year. The most popular managers fared a bit worse, with exactly 50% of the ten largest managers lagging after fees on average. Fund-of-funds data, although very limited, serve as a reminder that picking "good" managers is not easy, as we found only two fund-of-funds operating in this asset class, both of which underperformed after fees during the past three years, five years, and since inception.

[3] This analysis ignores the entry and exit fees associated with many commingled vehicles in this asset class, and the relatively high transaction costs for establishing or liquidating a separately managed account. These costs obviously affect the returns realized by investors, and should not be viewed as trivial by investors with a high manager turnover rate or that move opportunistically into and out of emerging markets.

## Appendix C-5

## CAMBRIDGE ASSOCIATES' EMERGING MARKETS MANAGER UNIVERSE

### Year-by-Year Analysis: Excess Return (Gross) Statistics
### January 1, 1999 through December 31, 2006

| Excess Return vs MSCI Emerging Markets Index | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | Average |
|---|---|---|---|---|---|---|---|---|---|
| Equal-Weighted Excess Return (%) | 6.5 | 1.7 | 1.2 | 2.7 | 3.4 | -0.3 | 2.2 | 0.4 | 2.2 |
| Asset-Weighted Excess Return (%) | 4.7 | 0.3 | -0.7 | 1.4 | 1.7 | 0.1 | 2.6 | -0.4 | 1.2 |
| Median Excess Return (%) | 5.8 | 2.1 | 0.5 | 2.6 | 1.7 | 0.1 | 2.1 | 0.1 | 1.9 |
| 55th Percentile (%) | 2.6 | 1.3 | 0.3 | 2.0 | 1.3 | -1.2 | 1.8 | -0.3 | 1.0 |
| Spread Between 5th and 95th Percentile | 53.6 | 18.2 | 15.2 | 16.9 | 28.5 | 20.4 | 19.4 | 16.4 | 23.6 |
| % of Managers with Positive Excess Gross Return | 63.0 | 59.0 | 58.3 | 73.2 | 61.7 | 51.5 | 64.1 | 59.7 | 61.3 |
| % of Managers with Outperformance > 100 bps | 59.3 | 55.7 | 46.7 | 60.7 | 58.3 | 44.1 | 60.9 | 48.4 | 54.3 |

### Comparison of Largest Managers to Rest of Universe

| % Outperforming by > 100 bps | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | Average |
|---|---|---|---|---|---|---|---|---|---|
| 10 Largest Managers | 60.0 | 50.0 | 20.0 | 50.0 | 60.0 | 60.0 | 70.0 | 30.0 | 50.0 |
| Rest of Universe | 59.1 | 56.9 | 52.0 | 63.0 | 58.0 | 41.4 | 59.3 | 51.9 | 55.2 |
| **Equal-Weighted Excess Return (Gross)** | | | | | | | | | |
| 10 Largest Managers | 9.2 | 0.5 | -1.8 | 1.5 | 2.3 | 2.1 | 1.8 | -0.6 | 1.9 |
| Rest of Universe | 5.8 | 1.9 | 1.7 | 3.0 | 3.7 | -0.7 | 2.2 | 0.5 | 2.3 |
| | | | | | | | | | AACR |
| MSCI Emerging Markets Index | 66.4 | -30.6 | -2.4 | -6.0 | 56.3 | 26.0 | 34.5 | 32.6 | 17.9 |
| S&P/IFC Investable Composite Index | 67.1 | -31.8 | 1.8 | -3.9 | 57.2 | 28.1 | 35.2 | 35.1 | 19.3 |

Sources: Cambridge Associates LLC Investment Manager Database and Morgan Stanley Capital International. MSCI data provided "as is" without any expressed or implied warranties.

Notes: Year-by-year returns include only managers that were in the database at the beginning of the year, with product assets greater than $50 million. This approach avoids an "add-in" bias. Managers for whom asset data were unavailable were excluded, as many likely had assets under $50 million. A small degree of survivorship bias remains, as managers dropped from the database during the year; the average number of managers dropping out during the year is 2.6%. The "true median" is likely between the reported median and 55th percentile. The ten largest managers are determined based upon product assets under management at the beginning of each year.