

C A M B R I D G E A S S O C I A T E S L L C

MANAGER HIRING AND FIRING

2003

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PREFACE

For many years, our annual report on U.S. equity managers has been prefaced by this caveat:

Few axioms are so universally acknowledged and persistently ignored as the ubiquitous disclaimer, 'past performance is no guarantee of future results.' Although prospectuses, offering memoranda, and promotional materials of all sorts prominently display this mandatory label, marketers rest assured in the knowledge that such warnings deter remarkably few investors from selecting last year's winners. Even dedicated value investors habitually abandon themselves to momentum investing when they select their managers.

In our 1998 paper, *U.S. Stock Manager Selection*, we wrote:

Investors typically hire and fire their U.S. stock portfolio managers primarily on the basis of recent performance. However, there is no compelling evidence of *persistence* in U.S. stock manager performance 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.

Investors intent on hiring active managers should develop a coherent, disciplined, explicit, long-term strategy for success 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).

In our 2000 paper, *Firing Managers: Should Performance Be Your Guide?* we noted that virtually all top-quartile managers in the decade ended December 31, 1999 had endured at least one three-year period of below-median performance and that most had spent at least one three-year period in the bottom quartile. This led us to advocate that:

The fallibility of interim performance numbers as predictors of long-term success argues strongly for the importance of investigating prospective managers very thoroughly, and sticking with preferred choices through thick and thin. Otherwise, even an investor successful in identifying top-quartile managers in advance might erode portfolio alpha by firing one or several after a period of underperformance.

And, finally, a footnote in *How Will You Earn What You Spend?* (2002) quoted Berkshire Hathaway's Charlie Munger with approbation: "It's stupid the way people extrapolate the past—and not slightly stupid, but massively stupid."

Nothing would please us more than to report that this persistent nagging has achieved the desired result: that manager turnover has dropped dramatically among our members, that they are no longer susceptible to the seductive allure of recent performance when considering new managers, and that their hiring deliberations are now so thorough that they are more likely to add funds to underperforming managers than to fire them.

Unfortunately, we doubt this is the case. When asked to conduct a manager search, our consultants still feel pressured by investment committees to draw up lists dominated by managers with stellar recent records; attempts to disparage the value of one- and three-year returns and to focus attention on longer-term results are often unavailing.

Undeterred, however, we will continue to beat this drum at every opportunity—for one simple reason: other than asset allocation, nothing we do is likely to add so much value to so many members as improving the quality of their manager selection process.

ABSTRACT

1. The results of this study reinforce our conviction that investors should establish a coherent, disciplined framework for the selection and evaluation of investment managers in order to minimize imprudent decisions. Although patience understandably wears thin when managers underperform for three years or longer, investors should be cautious about firing poorly performing managers who have simply adhered to their strategy during an unfavorable part of the market cycle and whose results fall within the range investors should have known to expect.
2. By definition, a poorly performing manager must have a very different investment approach from that of the top performer hired as a replacement. What many investors seem unable to grasp, however, is that the investment world is not linear (what has happened will persist), but cyclical (what goes up comes down and vice-versa), which results in their switching strategies at inopportune times.
3. An analysis of manager hirings and firings by 92 institutions in the period 1996-2001 indicates that the decision to switch managers usually detracted value. That is, on average, investors would have been better off staying the course since the fired manager subsequently outperformed the hired manager over one and three years in about 60% of the cases.
4. As one would expect, the performance of the fired managers in the one and three years *before* termination was relatively poor whereas that of the managers hired to replace them was stellar. Despite mountains of evidence to the contrary, investors cling stubbornly to the belief that recent performance is predictive of future success.
5. Why is this? We would speculate that many investment committees believe stock selection skill to be the primary determinant of differential performance among equity managers. If this were the case, it would be logical to assume that those possessed of such skill would persistently outperform those who lacked it. However, since the vast majority of equity managers minimize stock-specific risk (and return) by holding diversified portfolios, what actually determines their relative performance is their investment approach rather than their stock selection skills. Unfortunately, as noted above, investment approaches (e.g., investing in conservative rather than in aggressive growth stocks) are subject to periodic, unpredictable cycles. Consequently, any manager pursuing a consistent investment discipline will inevitably suffer periods of relative underperformance. Investors who fail to thoroughly understand both the basis and the variability of a manager's returns *before* hiring are likely to be disappointed by subsequent results.
6. Since most institutional investors use similar search criteria, with a heavy emphasis on very good three- to five-year relative performance, a blue-chip client list, and a reasonable level of assets, the majority of manager searches are won by a relatively small number of managers. However, those managers with the greatest growth in assets in a given year typically underperformed their competitors in subsequent one- and three-year periods. Similarly, those managers already in the top quartile when ranked by assets under management also tended to underperform their smaller competitors. Investors should therefore consider carefully before committing money either to a manager whose recent success is resulting in strong growth in assets or to one already managing a relatively large portfolio.

7. Although our research obviously leads us to warn investors against hiring the best recent performers, it does *not* suggest they should hire managers that have significantly underperformed. Studies showing that worst performers do well in future periods are typically riddled with data problems since managers that lag in both Period A and Period B will often liquidate or stop providing returns, leaving only managers that lagged in Period A and rebounded in Period B. The worst-performing managers will have difficulty attracting and retaining investment professionals, a decline in revenue could lead to their having fewer resources for research, and they might well be distracted by their need to rebuild the business.

8. In selecting managers, investors should pay relatively little attention to recent performance and regard *long-term* performance as only one among several important criteria.

SUMMARY

Manager Turnover in Institutional Portfolios

Our analysis of manager hiring and firing by 92 institutions that have used Cambridge Associates for performance reporting since 1996 indicates that investors are actively managing their managers. At the beginning of 1996, these institutions had 639 traditional marketable managers (i.e., excluding hedge funds and private equity) and in the course of the next 7.25 years they fired 652 managers and hired 907. Of the original 639 managers, only 249 were still in place at the end of March 2003, an attrition rate of 61%. *Every* institution hired at least one manager in this period, and all but two institutions fired at least one manager. If we were to include alternative assets, the numbers would be significantly higher.

Investors change managers for one or more of four reasons: a policy change in which an asset class is added or deleted; a manager structure change such as a shift between active and passive management; a tactical style bet (e.g., firing a growth manager and hiring a value manager instead); or an attempt to upgrade managers. Over 80% of the 652 manager firings and almost 90% of the 907 manager hirings can be attributed to the first three reasons, which are strategy changes.¹ Although we will examine only manager upgrades in this study, the sheer number of manager changes suggests that strategy shifts occur far too often.

Since we know that a manager's performance during a three- or five-year period is not predictive of performance during the subsequent period,² we would assume that investors' attempts to improve their results by switching managers would be largely unsuccessful. We tested this hypothesis by comparing the performance of managers hired with those of managers fired in those instances where the mandate was the same. In other words, we excluded those cases in which the investor made an asset allocation decision—replacing a growth manager with a value manager, for example—and focused only on those where the hired and fired managers occupied the same investment space (e.g., small-cap growth). We then looked at the issue at the industry level, comparing the future performance of the most popular managers, measured by new assets and absolute size, against that of their peers.

Are Attempts to Upgrade Managers Successful?

During the period 1996-2001, the total number of such manager fire/hire pairs was 103, with 61 of the 92 institutions having hired and fired a manager with the same mandate. Eighty-one of the 103 fire/hire pairs were equity managers and the rest fixed income.

The length of an institution's relationship with a terminated manager varied greatly, with a median of slightly more than four years. Three percent were fired less than one year after being hired, 26% were fired within one to three years, 28% within three to five years, and 43% after more than five years.

¹ The net increase in the number of managers can be explained in large part by the substantial increase in assets due to the bull market of the late 1990s. The average total asset size of these 92 institutions increased from \$128 million to \$217 million during this time (with corresponding medians of \$90 million and \$137 million). Over this time period, 75% had a net increase in their manager lineup, 16% decreased the number of managers, and 10% kept the total number of managers constant.

² See our papers, *U.S. Stock Manager Selection* (1998) and *Firing Managers: Should Performance Be Your Guide?* (2000).

Manager returns (gross of fees) were calculated for one and three years before and after the fire/hire date (Exhibit 1).³ Although we would argue that managers should not be judged on the basis of a period as short as three years,⁴ this is a battle we rarely win—three years still seems the limit of most investors' tolerance for a poorly performing manager. We therefore decided to use this as the time horizon for measuring the success of the manager switches we examined.

Before the manager fire/hire we found:

- The fired manager generally had poor prior performance. The equity managers lagged their benchmark index by 370 basis points (bps) on average in the year prior to the firing and by 170 bps in the prior three years. The median returns were typically less gruesome, with the fired managers virtually matching the index over the prior three years, but lagging by 520 bps in the prior year. On average, the fixed income managers lagged by 90 bps and 10 bps, respectively, over the prior one and three years, with the median return lagging by 20 bps and 30 bps.
- In contrast, hired managers had terrific past performance, with the equity managers beating the benchmark by 720 bps on average (median = 670 bps) in the prior year and by 480 bps over the prior three years (median = 520 bps). In fixed income, the hired managers had outperformed by 150 bps and 100 bps in the prior one and three years—enormous margins in the world of fixed income—with median outperformance of 80 bps and 60 bps, respectively.
- Across asset classes, the new manager had outperformed the fired manager over the prior three years in 85% of switches.

These results are no surprise. Investors become frustrated with managers who fail to keep up with their benchmark index. Once their confidence in a manager erodes, they are tempted to switch to a faster horse, implicitly assuming the new pony will be able to maintain its blistering pace.

After the manager fire/hire we found:⁵

- The fired equity managers outperformed the benchmark on average by 550 bps in the year after the switch and by 660 bps in the three years after the switch. Corresponding medians are 370 bps and 530 bps, with 80% of the fired managers outperforming the benchmark over the next three years.

³ Throughout the report, all multiple-year returns are given on an annualized basis. All returns are gross of management fees. We do not address risk-adjusted returns, since the volatility of any manager should be considered in the context of the whole portfolio. The fire/hire date is assumed to be the beginning of the quarter in which the manager was fired, as there is typically a delay of several weeks or months before a decision is implemented, and since Cambridge Associates collects quarterly returns. In each case, the benchmark is assumed to be the most commonly used benchmark for the asset class. (See "Methodological Notes" in the Appendix for further details.)

⁴ See, in particular, *Firing Managers: Should Performance Be Your Guide?* (2000).

⁵ We do not have post-firing performance information for nine of the equity pairs and for two of the fixed income pairs. In these cases, the managers were generally smaller regional managers that neither had composite information in our database nor a comparable mutual fund. Thirty-one of the fire/hire pairs do not yet have three years of post-switch history.

- The good news is that the new equity managers also outperformed, with average one- and three-year excess returns of 130 bps and 400 bps, respectively. However, corresponding medians fall to 50 bps and 280 bps, so about one-half of the hired managers lagged after fees in the first year.
- The bad news is that the fired equity manager outperformed the hired equity manager in 58% of the switches in the next year and in 60% of the switches over the next three years.
- Results for the hired and fired fixed income managers were more mixed, although the sample size is too small to offer meaningful conclusions.
 - Of the fired managers, nine of 20 outperformed the benchmark in the year after the switch, although a greater proportion (nine of 13) outperformed the benchmark in pairs for which three-year returns after the switch were available.
 - Thirteen of the 22 managers hired outperformed the benchmark one year after the switch, but eight of the hired managers lagged badly, underperforming by more than 150 bps. As with the fired managers, three years after the switch nine of 13 managers hired had outperformed.
 - The fired manager beat the hired manager in 13 of 20 switches over the next year and in six of 13 switches over the next three years.

In short, most institutions gained nothing by switching managers; in fact, they would have fared better without the change. Note also that we have made no provision for the cost of changing managers: if we required that new equity managers beat their replacements by at least 100 bps annually to justify the costs and disruptions associated with switching, only 35% of the changes could be labeled a success after one year and only 31% after three years. Although most institutions do not track the performance of the managers they have fired and therefore do not know that the fired manager often beat the hired manager, data on hired managers suggest the probability of some disillusionment:

- About 50% of new managers lagged the benchmark net of fees in the year after being hired.⁶
- In two-thirds of the cases, the three-year excess return of the hired manager was less than it had been during the three years prior to hiring, so investors expecting persistence in manager performance would have been disappointed.
- Of the 72 managers that were hired three or more years ago, nearly 30% have been fired.

As Exhibit 2 indicates, these results are the same across equity asset classes (e.g., U.S. and non-U.S. equity) and capitalization sectors. Of note, however, is that some investors replaced U.S. small-cap and global ex U.S. managers that were not lagging the benchmark, but were also not top-quartile performers. Subsequently, 54% of the managers hired in these two asset classes lagged the benchmark after fees in the year after being hired, and a similar percentage lagged the fired manager as well.

⁶ We assume annual fees of 60 bps for U.S. large-cap managers; 100 bps for U.S. small-cap, global ex U.S., emerging markets, and REIT managers; and 40 bps for fixed income managers. Thirty-six percent of the hired managers lagged net of fees over the three years after being hired.

With the caveat that the sample size shrinks as the data are sliced more finely, we note that the results are the same if one focuses just on those fired managers with the *worst* performance prior to being fired. This is consistent with the evidence that past performance is not predictive of future performance.

The Fate of Popular Funds

As noted earlier, there is an enormous number of institutional manager hirings each year. For example, on average, the 92 institutions we examined each hired 1.4 traditional marketable managers *each year* since 1996. Furthermore, many investors use the same search criteria, with a heavy emphasis on very good three- to five-year relative performance, a blue-chip client list, and a reasonable level of assets. This results in a small pool of managers winning the majority of manager searches in a particular period, leading to increased concentration of assets, especially in the smaller asset classes.

Manager Concentration as of December 31, 2002

	Emerging Markets	REITs	Small-Cap Growth	Small-Cap Value	Global ex U.S.
Total Assets (\$ billions)	84	36	126	121	547
Total # of Managers	75	43	232	218	216
5 Largest Managers	45.9%	43.9%	17.4%	15.8%	28.9%
10 Largest Managers	62.3%	66.9%	26.3%	24.7%	48.2%
Top Quartile by Assets	77.9%	66.9%	69.6%	67.3%	84.4%
Bottom Quartile by Assets	1.1%	1.9%	2.0%	1.4%	0.5%

Source: Cambridge Associates LLC Investment Manager Database.

The table above displays the year-end 2002 asset concentration within the Cambridge Associates LLC Investment Manager Database for five equity asset classes or sectors. Within the institutional investment management industry, the ten largest products account for nearly two-thirds of the emerging markets and REIT assets, one-fourth of the small-cap growth and value assets, and nearly one-half of the global ex U.S. assets.⁷ The largest quartile of managers by asset size manages two-thirds or more of the assets in each category. Emerging markets is particularly concentrated, with the single largest manager overseeing 17% of the \$84 billion market. Because some successful small-cap managers are closed to new investment, concentration levels for the ten largest managers in small-cap growth and value are lower than in other areas. At the other extreme, the bottom quartile of managers by asset size controls a mere 2% or less of total funds, consequently having very little aggregate impact on investors while influencing manager peer comparisons.⁸

⁷ Although the total assets in the Cambridge Associates LLC Investment Manager Database do not equal the total assets in the marketplace for each asset class, the managers included offer a fair representation of the investable universe for institutional investors.

⁸ The level of industry concentration is a reminder of the limited value of manager rankings. Although a median manager return illustrates the return to managers, it says very little about the return to the total dollars invested and is often not reflective of the universe of managers an institution would have seriously considered for investment.

Do institutions benefit from hiring the most popular managers? For institutions that place a premium on name recognition and peer risk, the answer is "yes" regardless of future performance. However, most institutions typically define manager success in terms of performance relative to the benchmark and relative to that of other managers occupying the same investment space. Consequently, we compared the future performance of the most popular managers to that of their competitors in each of five equity asset classes or sectors: emerging markets, U.S. REIT, U.S. small-cap growth, U.S. small-cap value, and global ex U.S. (U.S. large-cap equity managers were not included due to the definitional problems associated with this asset class.)

Starting in 1998, we adjusted every manager's annual change in assets by the manager's composite return to get a proxy for the assets gained or lost during the year. We define "popular" managers as the top quartile of managers ranked by their return-adjusted dollar change in assets (i.e., the managers that got the most new money). We then compared the equal-weighted average return of this most popular quartile against that of the other 75% of managers over the next one and three years (or two years in the case of the period following the year 2000).⁹

We calculated *prior-year* excess returns to the most popular managers in 1999 and 2000 to show what everyone knows intuitively: the most popular managers are popular because of good past performance. The 1999 performance gap between the most popular managers in 2000 and the rest of the universe was 650 bps for emerging markets, 840 bps for global ex U.S., -100 bps for REITs, 1,280 bps for small-cap value, and an astonishing 2,810 bps for small-cap growth. The 1998 differentials are less shocking for 1999's popular managers, ranging from 150 bps for emerging markets and REITs to 500 bps for small-cap growth and value (Exhibit 3). In general, however, it is clear that investors tend to gravitate to "hot" managers.

We see a very different story for these managers in the years after becoming popular (Exhibits 4-12):

- The managers with the greatest growth in assets in 1998 and 2000 lagged the rest of the universe in four of five asset classes the following year. The popular managers in 1999 lagged in three of five asset classes. The average one-year shortfall was 240 bps (with a median shortfall of 277 bps).
- Over the next three years, 1998's popular managers lagged the rest of the universe in three of five asset classes, and 1999's popular managers lagged in all five asset classes.
- The underperformance was particularly dramatic for popular small-cap growth managers, as money flowed to those that had been most successful by focusing on strategies that subsequently crashed. For example, 1998's most popular growth managers lagged peers by 1,340 bps over the next year as aggressive growth stocks soared in 1999. The big winners in 1999 became the most popular managers in 2000, who then lagged peers by 510 bps in 2001.
- When the universe is limited to managers with assets greater than \$100 million, the relative performance of popular managers generally improved, but the conclusion remains the same.

⁹ Institutional databases suffer from an "add-in" bias that occurs when managers added to the database have their historical performance, which is generally very good, added to the database. This inflates returns to the whole universe and artificially lowers the relative performance of popular managers, since the vast majority of managers that are backfilled would not have been realistic options for large institutional investors during those previous years. We sought to minimize "add-in" bias by including only managers that were already in the database at the beginning of the year examined. Due to a system conversion, entry dates prior to 1998 are not available, prompting us to begin our study as of that year.

These results suggest that investors whose primary reason for hiring new managers is the hope of earning superior returns should think twice before hiring the most popular managers to whom other investors are eagerly funneling money. However, although the popular managers failed to outperform their peers, they did manage, on average, to outperform the benchmark index in most asset classes over one and three years (see Exhibit 7)—as did most managers during the period in question (1999-2002).

It should be noted that this analysis examines only one five-year period during a very volatile market environment. Although a longer time period would have been preferable, the magnitude of the bull run of the late 1990s, the dramatic bursting of the technology bubble in 2000, and the ensuing market slowdown in the following years offer an opportunity to analyze an entire market cycle over a relatively short period. In small-cap growth, the sector most obviously caught up in the boom and bust, the extreme differentials between popular managers and their peers seem unlikely to persist in less turbulent times. Since the results were otherwise relatively consistent across asset classes and sectors, however, we regard them as reasonably representative of what might be expected in other market environments.

The Fate of the Largest Managers

Instead of measuring "popularity" on the basis of growth in assets from one year to the next, one might also equate it with size, taking the view that the managers with the most assets are by definition the most popular. The first approach measures period-specific popularity while the latter measures popularity over longer, more indeterminate time periods. Consequently, as a further test of how most investors—not most managers—actually fared, we compared asset-weighted manager returns both to equal-weighted manager returns and to median manager returns in each year from 1998-2002. Again, to minimize the add-in bias in the database, we used only managers that were in the database at the beginning of the year analyzed. Similarly, to reduce survivorship bias, we make year-by-year calculations rather than a full period calculation.

Asset-weighted returns were generally lower than equal-weighted and median manager returns, implying that the largest managers fared worse than their competitors. Over the five years, the asset-weighted return lagged the equal-weighted return by 140 bps per annum in emerging markets, by 280 bps in small-cap growth, and by 80 bps in small-cap value. Results for global ex U.S. and REITs showed little difference between asset-weighted and equal-weighted returns.

In sum, both approaches to "popularity" point to the same conclusion: managers that either already have or succeed in attracting larger amounts of money generally underperform their less popular peers.

Implications for Investors

Hire and fire in haste, repent at leisure. The results of this study reinforce our conviction that investors should establish a coherent, disciplined framework for the selection and evaluation of investment managers in order to minimize imprudent decisions. Although patience understandably wears thin when managers underperform for three years or longer, investors should be cautious about firing poorly performing managers who have simply adhered to their strategy during an unfavorable part of the market cycle and whose results fall within the range investors should have known to expect. By

definition, the lagging manager that is fired must have a very different investment approach from that of the top performer hired as a replacement. What many investors seem unable to grasp, however, is that the investment world is not linear (what has happened will persist), but cyclical (what goes up comes down and vice-versa), and this results in their switching strategies at inopportune times.

Since most investment managers run relatively diversified portfolios, the primary determinant of performance is their investment approach rather than stock selection. For example, many of the best-performing growth managers in 2001 and 2002 have an investment approach that steered them away from high P/E companies, or companies with no earnings. These managers are not "better" than aggressive growth managers, and may not be better stock pickers; they simply have an investment approach that caused them to lag badly in 1998-1999, but to outperform more aggressive competitors in 2001-2002. The equity managers receiving the most inflows in any year tend, therefore, to be those pursuing an investment approach that happens to have worked well recently. Investors hiring them should only do so with a clear recognition of when that approach is likely to generate better or worse results, regardless of the manager's stock selection skill.

In some cases, a manager's poor performance may in fact be an indicator of serious organizational problems that would justify termination, but performance alone should not be used as the sole indicator of a manager's worth. This is not a new message, and an excerpt from our 1998 paper, *U.S. Stock Manager Selection* is worth reiterating:

Since investors cannot predict what investment approach will work best tomorrow, it makes sense to diversify by hiring several managers adept at different disciplines, and to rebalance among them periodically. This requires patience—again a five-year time horizon is too short—and a commitment to *adding* funds to managers that have recently underperformed. Nothing better underlines why investors 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 not only to stay the course but to add funds when managers underperform (as *all* managers do at one time or another). In other words, investors intent on hiring active managers should develop a coherent, disciplined, explicit, long-term strategy for success 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.

This paper also suggests that institutions with sufficient resources should develop "farm team" managers to whom they give nominal allocations while studying them for a number of years. Those that perform as anticipated can be given larger allocations when another manager is terminated, rather than investing those funds with a new manager chosen from a list of recent top-quartile performers. High levels of industry concentration imply that such discipline is not the norm, as a relatively small group of popular managers benefits from manager turnover. In addition to giving investors a broader window on the market, having managers ready to assume a greater role in the overall portfolio can avoid a rushed manager search and the disappointing results that often follow.

Investors should also be wary of basing decisions on manager rankings. In the short term, rankings are irrelevant, and longer term their integrity is eroded by database biases that generally understate the true relative performance of a given manager. Rankings should be used only as a tool for understanding differences among managers; the primary benchmark for measuring manager success should be the index that best reflects the investment space the manager occupies.

Although our research obviously leads us to warn investors against hiring the best recent performers, it does not suggest they should hire managers that have significantly underperformed. Studies showing that worst past performers do well in future periods are typically riddled with data problems since managers that lag in both Period A and Period B will often liquidate or stop providing returns, leaving only managers that lagged in Period A and rebounded in Period B. The worst-performing managers will have difficulty attracting and retaining investment professionals, a decline in revenue could lead to their having fewer resources for research, and they might well be distracted by their need to rebuild the business. Finally, the reputational (or career) risk of hiring a badly performing manager that might continue to perform badly makes this an unrealistic option for most investors.

So how should investors evaluate and select their managers? First, they should develop a clear understanding of the role each manager plays in the portfolio and the expected variability of returns of their chosen strategies. *Before* launching a manager search, they should establish a list of important criteria managers must meet in order to be eligible for consideration. One of these should be performance, but performance should be used as a hurdle for inclusion rather than as a ranking tool, and we would recommend long-term performance greater than the benchmark (net of fees) as a more realistic hurdle rate than, say, 100 bps of excess return. Managers' historical records should be seen as a means of understanding both the distinctions among them and the likely variability of their future returns. A recent burst of significant outperformance should serve as a warning flag of significant future downside potential and of probable asset growth in the near future. Once the pool of prospective managers has been established, investors should select the manager best suited to fill the defined role in the portfolio, regardless of that manager's relative performance ranking.

EXHIBITS

Exhibit 1

EQUITY MANAGER HIRING AND FIRING DECISIONS

All Equity Manager Changes

	Differences: New Mgr – Fired Mgr				Excess Rtn: Fired Manager				Excess Rtn: New Manager			
	3-Yrs Prior	1-Yr Prior	1-Yr Post	3-Yrs Post	3-Yrs Prior	1-Yr Prior	1-Yr Post	3-Yrs Post	3-Yrs Prior	1-Yr Prior	1-Yr Post	3-Yrs Post
Total Count	71	80	77	48	77	80	77	49	75	81	81	54
Average (% pts)	6.2	11.0	-4.1	-2.9	-1.7	-3.7	5.5	6.6	4.8	7.2	1.3	4.0
Median (% pts)	6.1	8.9	-1.5	-2.7	0.0	-5.2	3.7	5.3	5.2	6.7	0.5	2.8
# Positive	61	63	32	19	40	30	46	39	60	56	43	40
% Positive	86%	79%	42%	40%	52%	38%	60%	80%	80%	69%	53%	74%
% Negative	14%	21%	58%	60%	48%	63%	40%	20%	20%	31%	47%	26%

Manager Changes After One-Year Underperformance

	Differences: New Mgr – Fired Mgr				Excess Rtn: Fired Manager				Excess Rtn: New Manager			
	3-Yrs Prior	1-Yr Prior	1-Yr Post	3-Yrs Post	3-Yrs Prior	1-Yr Prior	1-Yr Post	3-Yrs Post	3-Yrs Prior	1-Yr Prior	1-Yr Post	3-Yrs Post
Total Count	45	50	46	32	49	50	46	32	46	50	50	37
Average (% pts)	7.3	13.7	-6.6	-2.4	-4.4	-13.6	7.0	8.7	3.4	0.1	0.5	6.3
Median (% pts)	7.6	14.7	-3.2	-2.9	-2.8	-9.6	4.0	8.3	5.1	1.5	-1.5	4.8
% Positive	91%	86%	37%	38%	31%	0%	59%	84%	74%	54%	44%	81%
% Negative	9%	14%	63%	63%	69%	100%	41%	16%	26%	46%	56%	19%

Manager Changes After Three-Year Underperformance

	Differences: New Mgr – Fired Mgr				Excess Rtn: Fired Manager				Excess Rtn: New Manager			
	3-Yrs Prior	1-Yr Prior	1-Yr Post	3-Yrs Post	3-Yrs Prior	1-Yr Prior	1-Yr Post	3-Yrs Post	3-Yrs Prior	1-Yr Prior	1-Yr Post	3-Yrs Post
Total Count	34	37	34	22	37	37	34	22	34	37	37	26
Average (% pts)	8.5	14.1	-7.8	-3.5	-7.1	-14.3	10.0	9.9	1.3	-0.2	2.1	6.5
Median (% pts)	8.7	14.8	-3.7	-5.1	-4.7	-13.1	7.1	8.8	4.7	2.1	0.1	4.4
% Positive	94%	89%	32%	32%	0%	8%	68%	82%	65%	54%	51%	81%
% Negative	6%	11%	68%	68%	100%	92%	32%	18%	35%	46%	49%	19%

Notes: All three-year returns are on an annualized basis. Percentages may not total due to rounding. Differences required data for both pairs.

Exhibit 1 (continued)

FIXED INCOME MANAGER HIRING AND FIRING DECISIONS

All Fixed Income Manager Changes

	Differences: New Mgr – Fired Mgr				Excess Rtn: Fired Manager				Excess Rtn: New Manager			
	3-Yrs	1-Yr	1-Yr	3-Yrs	3-Yrs	1-Yr	1-Yr	3-Yrs	3-Yrs	1-Yr	1-Yr	3-Yrs
	Prior	Prior	Post	Post	Prior	Prior	Post	Post	Prior	Prior	Post	Post
Total Count	20	21	20	13	22	22	20	13	20	21	22	13
Average (% pts)	1.0	2.5	-0.1	-0.5	-0.1	-0.9	-0.7	0.1	1.0	1.5	-0.7	-0.4
Median (% pts)	0.8	1.2	-0.8	0.0	-0.3	-0.2	-0.3	0.0	0.6	0.8	0.5	0.3
# Positive	16	16	7	7	9	8	9	9	16	16	13	9
# Negative	4	5	13	6	13	14	11	4	4	5	9	4

Manager Changes After One-Year Underperformance

	Differences: New Mgr – Fired Mgr				Excess Rtn: Fired Manager				Excess Rtn: New Manager			
	3-Yrs	1-Yr	1-Yr	3-Yrs	3-Yrs	1-Yr	1-Yr	3-Yrs	3-Yrs	1-Yr	1-Yr	3-Yrs
	Prior	Prior	Post	Post	Prior	Prior	Post	Post	Prior	Prior	Post	Post
Total Count	13	14	12	7	14	14	12	7	13	14	14	7
Average (% pts)	1.5	3.1	0.9	0.2	-0.8	-2.6	-1.8	0.0	0.8	0.6	-0.6	0.2
Median (% pts)	0.9	1.1	-0.3	0.3	-0.6	-0.4	-0.5	0.0	0.6	0.5	0.5	0.5
# Positive	11	12	5	4	3	0	5	5	10	9	9	5
# Negative	2	2	7	3	11	14	7	2	3	5	5	2

Manager Changes After Three-Year Underperformance

	Differences: New Mgr – Fired Mgr				Excess Rtn: Fired Manager				Excess Rtn: New Manager			
	3-Yrs	1-Yr	1-Yr	3-Yrs	3-Yrs	1-Yr	1-Yr	3-Yrs	3-Yrs	1-Yr	1-Yr	3-Yrs
	Prior	Prior	Post	Post	Prior	Prior	Post	Post	Prior	Prior	Post	Post
Total Count	11	12	12	6	13	13	12	6	11	12	13	6
Average (% pts)	1.8	3.2	1.0	-0.2	-1.1	-2.5	-2.0	0.2	0.7	0.4	-0.9	0.0
Median (% pts)	1.0	0.9	-0.3	-0.1	-0.7	-0.3	-0.4	0.0	0.6	0.5	0.5	0.3
# Positive	10	9	5	3	0	2	4	5	8	8	8	4
# Negative	1	3	7	3	13	11	8	1	3	4	5	2

Notes: All three-year returns are on an annualized basis. Due to a small sample size for fixed income, percentage positive and negative are not given. Differences required data for both pairs.

Exhibit 2
EQUITY MANAGER PAIRS BY ASSET CLASS

Average Returns

	Pairs*	Differences: New Mgr – Fired Mgr			Excess Return: Fired Mgrs			Excess Return: New Mgrs					
		3-Yrs Prior	1-Yr Prior	Post	3-Yrs Prior	1-Yr Prior	Post	3-Yrs Prior	1-Yr Prior	Post			
U.S. Mid-/Large-Cap Equity	35	5.5	10.0	-3.5	-3.1	-6.0	-7.4	7.9	7.2	0.3	2.5	4.3	5.1
U.S. Small-Cap Equity	11	6.8	20.4	-17.2	-13.0	2.7	-3.5	3.7	6.9	10.2	16.9	-11.8	-3.4
Global ex U.S. Equity	28	7.9	9.4	0.2	0.3	1.3	1.0	2.6	6.3	8.7	10.4	2.7	5.6
Emerging Markets	5	1.2	5.8	-8.3	-4.0	1.3	-4.1	10.7	6.0	2.4	1.7	2.4	2.0

Median Returns

	Pairs*	Differences: New Mgr – Fired Mgr			Excess Return: Fired Mgrs			Excess Return: New Mgrs					
		3-Yrs Prior	1-Yr Prior	Post	3-Yrs Prior	1-Yr Prior	Post	3-Yrs Prior	1-Yr Prior	Post			
U.S. Mid-/Large-Cap Equity	35	4.2	9.6	-3.0	-3.2	-4.7	-10.3	3.5	6.7	3.3	3.0	3.3	4.3
U.S. Small-Cap Equity	11	5.7	15.9	-13.6	-7.7	2.3	0.8	5.4	6.2	8.0	3.5	-5.1	1.9
Global ex U.S. Equity	28	7.7	9.1	0.8	1.0	1.0	-1.6	-1.0	4.8	8.1	11.1	1.4	2.8
Emerging Markets	5	-0.6	7.1	-7.7	-2.6	1.1	-5.5	10.7	5.8	3.1	-2.5	-0.4	2.3

Note: All three-year returns are on an annualized basis.

* REITs are excluded due to a small sample size (two pairs).

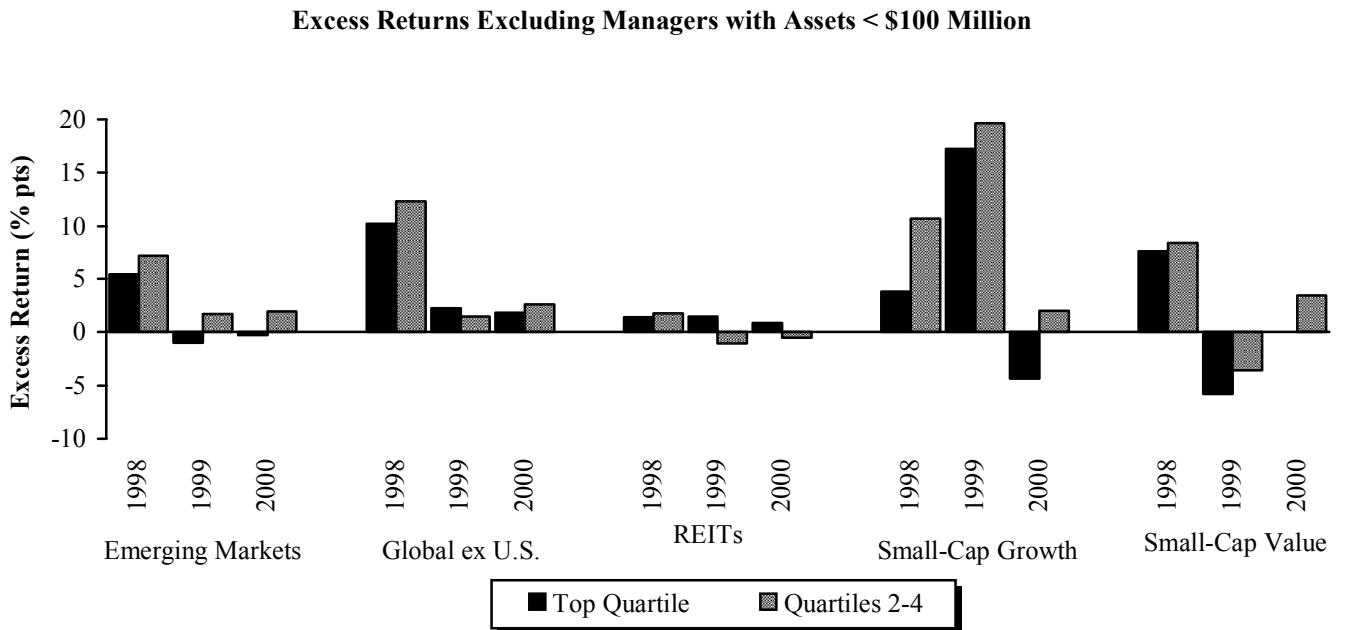
Exhibit 3**PRIOR RETURNS TO POPULAR MANAGERS**

<u>Asset Class</u>	<u>Year of Flows</u>	<u>Previous Year Excess Return (% pts)</u>		
		<u>Popular</u>	<u>Other</u>	<u>Difference</u>
Emerging Markets	1999	1.5	-0.1	1.5
Emerging Markets	2000	11.7	5.1	6.5
Global ex U.S.	1999	-1.6	-3.9	2.4
Global ex U.S.	2000	19.9	11.5	8.4
REITs	1999	3.5	2.0	1.5
REITs	2000	1.6	2.6	-1.0
Small-Cap Growth	1999	9.4	4.4	5.0
Small-Cap Growth	2000	40.3	12.2	28.1
Small-Cap Value	1999	7.3	2.3	5.0
Small-Cap Value	2000	22.8	10.0	12.8

Notes: All three-year returns are on an annualized basis. "Popular" managers are the top quartile of managers ranked by the market-adjusted dollar change in assets. Excess returns are gross of manager fees. See "Methodological Notes" for details on survivorship bias. Differences may not total due to rounding.

Exhibit 4

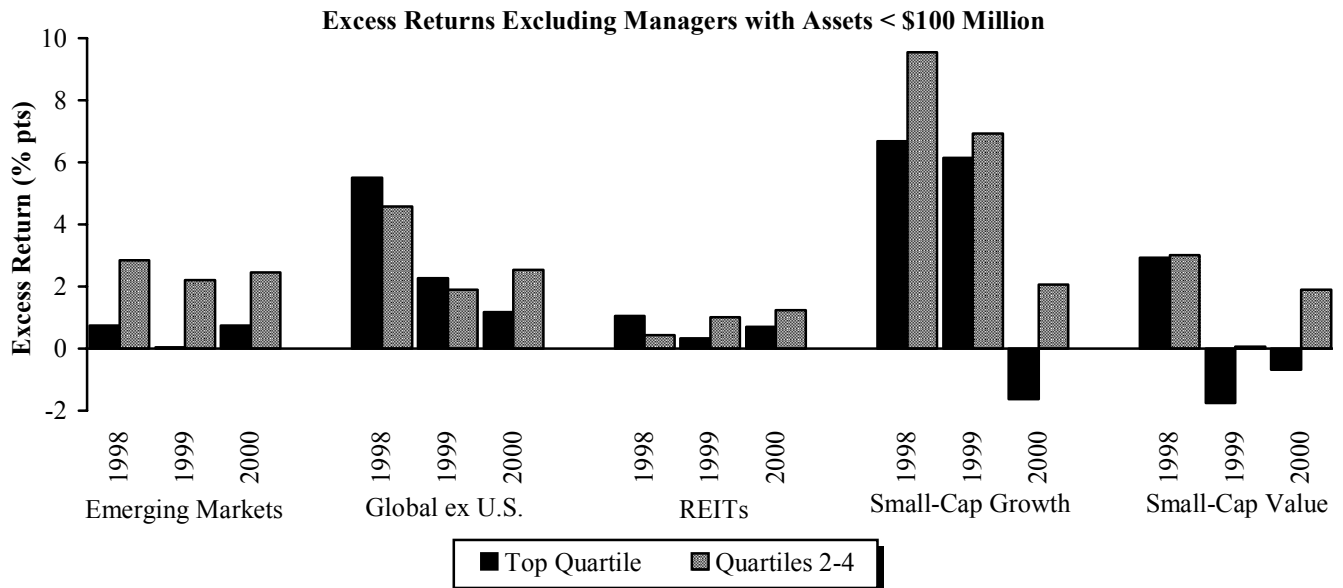
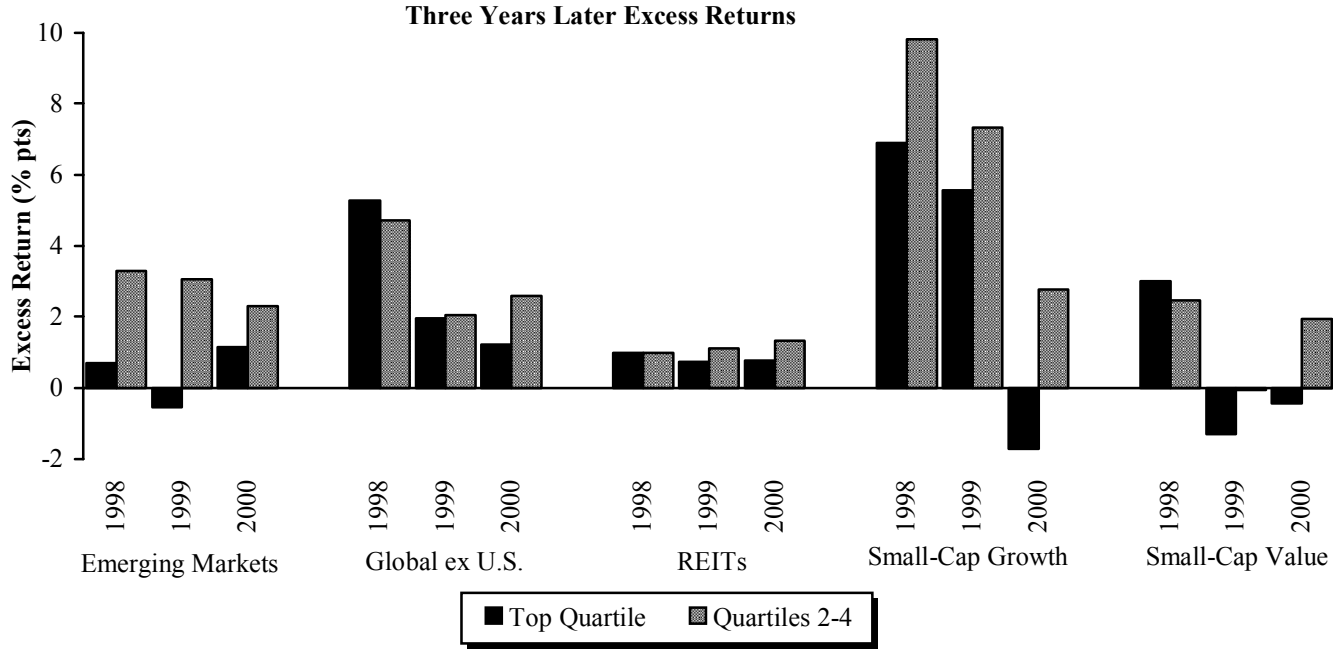
POPULAR MANAGER EXCESS RETURNS: ONE YEAR LATER



Notes: In each year beginning in 1998, we adjusted each manager's change in assets by the manager's composite return to get a proxy for the assets gained or lost during the year beyond market movements. "Popular" managers are the top quartile of managers ranked by the market-adjusted dollar change in assets. Excess returns are gross of manager fees. See "Methodological Notes" for details on survivorship bias. The first set of values is the 1999 equal-weighted excess return for the emerging markets managers adding the most assets (net of market returns) in 1998, and the equal-weighted return to quartiles 2-4. The bottom chart summarizes the same analysis excluding managers with assets of less than \$100 million at the beginning of each period.

Exhibit 5

POPULAR MANAGER EXCESS RETURNS: THREE YEARS LATER



Notes: In each year beginning in 1998, we adjusted each manager's change in assets by the manager's composite return to get a proxy for the assets gained or lost during the year beyond market movements. "Popular" managers are the top quartile of managers ranked by the market-adjusted dollar change in assets. Excess returns are gross of manager fees. Two-year performance is given for the 2000 managers. See "Methodological Notes" for details on survivorship bias. The first set of values is the 1999-2001 equal-weighted excess return for the emerging markets managers adding the most assets (net of market returns) in 1998, and the equal-weighted return to quartiles 2-4. The bottom chart summarizes the same analysis excluding managers with assets of less than \$100 million at the beginning of each period.

Exhibit 6

POPULAR MANAGER RETURNS COMPARED TO OTHER MANAGER MEDIANS

<u>Year</u>	<u>Asset Class</u>	<u>All Managers</u> <u>% Popular Mgrs > Other Median</u>		<u>Managers > \$100 million</u> <u>% Popular Mgrs > Other Median</u>	
		<u>1 Year</u>	<u>3 Years</u>	<u>1 Year</u>	<u>3 Years</u>
1998	Emerging Markets	27%	21%	36%	18%
1999	Emerging Markets	13%	13%	33%	25%
2000	Emerging Markets	47%	29%	36%	29%
1998	Global ex U.S.	38%	60%	36%	58%
1999	Global ex U.S.	60%	55%	65%	55%
2000	Global ex U.S.	58%	56%	59%	56%
1998	REITs	33%	50%	25%	50%
1999	REITs	86%	29%	80%	20%
2000	REITs	57%	29%	50%	50%
1998	Small-Cap Growth	38%	33%	43%	39%
1999	Small-Cap Growth	42%	48%	46%	59%
2000	Small-Cap Growth	30%	35%	33%	43%
1998	Small-Cap Value	44%	56%	52%	63%
1999	Small-Cap Value	39%	45%	38%	39%
2000	Small-Cap Value	44%	38%	23%	42%

Notes: The first line may be interpreted as follows: Of the emerging markets managers receiving the most assets in 1998, 27% outperformed the median of the other managers (quartiles 2-4 in terms of 1998 inflows) in 1999. Of this same group, 21% outperformed the median of the remaining managers in 1999-2001. If the universe is reduced to only managers with \$100 million or more product assets, the corresponding values are 36% and 18%, respectively. Bold type denotes an outperformance of over 50%. "Popular" managers are the top quartile of managers ranked by the market-adjusted dollar change in assets. The sample size for REITs is too small to offer meaningful results.

Exhibit 7

MEDIAN EXCESS RETURNS: POPULAR MANAGERS VERSUS OTHER MANAGERS

Year	Asset Class	One Year Later			Three Years Later		
		Top Quartile	Quartiles 2-4	Gap	Top Quartile	Quartiles 2-4	Gap
1998	Emerging Markets	-0.9	6.6	-7.5	0.8	2.9	-2.1
1999	Emerging Markets	-1.3	2.6	-3.9	0.2	2.3	-2.1
2000	Emerging Markets	0.5	1.1	-0.6	1.6	2.4	-0.8
	Compounded	-0.6	3.4	-4.1	0.8	2.5	-1.7
1998	Global ex U.S.	2.5	8.6	-6.0	4.8	3.8	1.0
1999	Global ex U.S.	0.3	-0.1	0.4	2.1	0.8	1.3
2000	Global ex U.S.	2.4	1.2	1.2	1.6	0.8	0.8
	Compounded	1.7	3.1	-1.5	2.8	1.8	1.0
1998	REITs	1.2	2.5	-1.3	0.8	1.0	-0.2
1999	REITs	0.9	-0.4	1.3	0.7	1.0	-0.4
2000	REITs	1.2	-0.1	1.3	5.4	1.6	3.9
	Compounded	1.1	0.7	0.4	2.3	1.2	1.1
1998	Small-Cap Growth	-7.6	5.8	-13.4	7.4	10.3	-2.9
1999	Small-Cap Growth	14.7	16.4	-1.8	7.3	7.4	-0.2
2000	Small-Cap Growth	-4.2	0.9	-5.1	-1.2	2.3	-3.5
	Compounded	0.5	7.5	-6.9	4.4	6.6	-2.2
1998	Small-Cap Value	5.5	8.4	-2.9	3.6	2.2	1.4
1999	Small-Cap Value	-5.9	-3.6	-2.3	-0.2	0.5	-0.7
2000	Small-Cap Value	1.4	2.4	-0.9	1.7	2.9	-1.2
	Compounded	0.3	2.3	-2.0	1.7	1.9	-0.2
Average				-2.8		-0.4	

Notes: "Year" refers to the year of the manager's popularity. Returns reflect performance in the following one year and three years. For example, the 1999 performance and 1999-2001 performance are given for the 1998 managers. "Popular" managers are the top quartile of managers ranked by the market-adjusted dollar change in assets. Excess returns are gross of manager fees. Gaps may not total due to rounding.

Exhibit 8**EMERGING MARKETS EQUITY MANAGERS****Industry Concentration**

Number of Managers in Database as of December 31, 2002 = 75
 Total Asset Class Assets = \$84.4 billion
 % of Total Assets Managed by the 10 Largest Managers = 62.3%

Asset Distribution by Quartile:	
<u>Quartile</u>	<u>% of Total Assets</u>
1st	77.9%
2nd	15.0%
3rd	6.0%
4th	1.1%

Manager Excess Returns (vs MSCI Emerging Markets Free)

	<u>Number of Managers</u>	<u>Asset-Weighted</u>	<u>Equal-Weighted</u>	<u>Median</u>
1998	58	1.5	0.3	-0.2
1999	64	4.0	6.3	4.6
2000	67	-0.1	1.9	1.9
2001	68	-0.7	1.6	1.3
2002	58	0.8	2.2	2.0
Average		1.1	2.5	

Future Excess Performance of "Popular" Managers (vs MSCI Emerging Markets Free)

	<u>Number of Managers</u> ¹	<u>Average Future 1-Year Performance</u>		<u>Average Future 3-Year Performance</u> ³	
		<u>Popular Manager (Top Quartile)</u>	<u>Rest of Manager Universe (Quartiles 2-4)</u>	<u>Popular Manager (Top Quartile)</u>	<u>Rest of Manager Universe (Quartiles 2-4)</u>
1998	56	1.9 ²	7.7	0.7	3.3
1999	59	-1.0	2.7	-0.5	3.1
2000	65	0.2	1.7	1.2	2.3

Notes: Excess returns are gross of manager fees. "Popular" managers are the top quartile of managers ranked by the market-adjusted dollar change in assets.

¹ See "Methodological Notes" for details on survivorship bias.

² This is the 1999 equal-weighted return for the managers adding the most assets (net of market returns) in 1998.

³ Two-year performance for the 2000 managers.

Exhibit 9**GLOBAL EX U.S. EQUITY MANAGERS****Industry Concentration**

Number of Managers in Database as of December 31, 2002 = 216
 Total Asset Class Assets = \$547.0 billion
 % of Total Assets Managed by the 10 Largest Managers = 48.2%

Asset Distribution by Quartile:

<u>Quartile</u>	<u>% of Total Assets</u>
1st	84.4%
2nd	11.4%
3rd	3.6%
4th	0.5%

Manager Excess Returns (vs MSCI EAFE)

	<u>Number of Managers</u>	<u>Asset-Weighted</u>	<u>Equal-Weighted</u>	<u>Median</u>
1998	139	-4.5	-3.5	-3.1
1999	149	11.5	12.5	8.4
2000	163	3.2	2.0	0.2
2001	160	3.7	2.5	2.2
2002	160	2.3	2.1	1.1
Average		3.2	3.1	

Future Excess Performance of "Popular" Managers (vs MSCI EAFE)

	<u>Number of Managers</u> ¹	<u>Average Future 1-Year Performance</u>		<u>Average Future 3-Year Performance</u> ³	
		<u>Popular Manager (Top Quartile)</u>	<u>Rest of Manager Universe (Quartiles 2-4)</u>	<u>Popular Manager (Top Quartile)</u>	<u>Rest of Manager Universe (Quartiles 2-4)</u>
1998	130	11.1 ²	12.1	5.3	4.7
1999	137	1.9	1.7	2.0	2.0
2000	154	1.8	2.7	1.2	2.6

Notes: Excess returns are gross of manager fees. "Popular" managers are the top quartile of managers ranked by the market-adjusted dollar change in assets.

¹ See "Methodological Notes" for details on survivorship bias.

² This is the 1999 equal-weighted return for the managers adding the most assets (net of market returns) in 1998.

³ Two-year performance for the 2000 managers.

Exhibit 10

REAL ESTATE INVESTMENT TRUST (REIT) MANAGERS

Industry Concentration

Number of Managers in Database as of December 31, 2002 = 43
 Total Asset Class Assets = \$36.3 billion
 % of Total Assets Managed by the 10 Largest Managers = 66.9%

Asset Distribution by Quartile:

<u>Quartile</u>	<u>% of Total Assets</u>
1st	66.9%
2nd	22.5%
3rd	8.7%
4th	1.9%

Manager Excess Returns (vs WARESI)

	<u>Number of Managers</u>	<u>Asset-Weighted</u>	<u>Equal-Weighted</u>	<u>Median</u>
1998	24	1.6	2.1	1.3
1999	30	2.5	1.9	1.9
2000	33	-0.2	-1.4	0.3
2001	31	-0.6	-0.3	-0.1
2002	34	0.9	1.6	1.6
Average		0.9	0.8	

Future Excess Performance of "Popular" Managers (vs WARESI)

	<u>Number of Managers</u> ¹	<u>Average Future 1-Year Performance</u>		<u>Average Future 3-Year Performance</u> ³	
		<u>Popular Manager (Top Quartile)</u>	<u>Rest of Manager Universe (Quartiles 2-4)</u>	<u>Popular Manager (Top Quartile)</u>	<u>Rest of Manager Universe (Quartiles 2-4)</u>
1998	24	1.5 ²	1.3	1.0	1.0
1999	27	1.5	-3.4	0.7	1.1
2000	32	1.0	-0.5	0.8	1.3

Notes: Excess returns are gross of manager fees. "Popular" managers are the top quartile of managers ranked by the market-adjusted dollar change in assets.

¹ See "Methodological Notes" for details on survivorship bias.

² This is the 1999 equal-weighted return for the managers adding the most assets (net of market returns) in 1998.

³ Two-year performance for the 2000 managers.

Exhibit 11

SMALL-CAP GROWTH MANAGERS

Industry Concentration

Number of Managers in Database as of December 31, 2002 = 232	
Total Asset Class Assets = \$126.5 billion	
% of Total Assets Managed by the 10 Largest Managers = 26.3%	
Asset Distribution by Quartile:	
<u>Quartile</u>	<u>% of Total Assets</u>
1st	69.6%
2nd	20.3%
3rd	8.1%
4th	2.0%

Manager Excess Returns (vs Russell 2000® Growth)

	<u>Number of Managers</u>	<u>Asset-Weighted</u>	<u>Equal-Weighted</u>	<u>Median</u>
1998	121	4.9	5.8	4.8
1999	134	6.2	11.2	3.3
2000	160	14.4	19.0	16.0
2001	170	-1.9	0.9	-0.7
2002	174	2.2	2.4	2.6
Average		5.1	7.9	

Future Excess Performance of "Popular" Managers (vs Russell 2000® Growth)

	<u>Number of Managers</u> ¹	<u>Average Future 1-Year Performance</u>		<u>Average Future 3-Year Performance</u> ³	
		<u>Popular Manager (Top Quartile)</u>	<u>Rest of Manager Universe (Quartiles 2-4)</u>	<u>Popular Manager (Top Quartile)</u>	<u>Rest of Manager Universe (Quartiles 2-4)</u>
1998	113	1.5 ²	12.7	6.9	9.8
1999	127	16.7	19.3	5.6	7.3
2000	152	-4.3	3.2	-1.7	2.8

Notes: Excess returns are gross of manager fees. "Popular" managers are the top quartile of managers ranked by the market-adjusted dollar change in assets.

¹ See "Methodological Notes" for details on survivorship bias.

² This is the 1999 equal-weighted return for the managers adding the most assets (net of market returns) in 1998.

³ Two-year performance for the 2000 managers.

Exhibit 12

SMALL-CAP VALUE MANAGERS

Industry Concentration

Number of Managers in Database as of December 31, 2002 = 218	
Total Asset Class Assets = \$121.4 billion	
% of Total Assets Managed by the 10 Largest Managers = 24.7%	
Asset Distribution by Quartile:	
<u>Quartile</u>	<u>% of Total Assets</u>
1st	67.3%
2nd	22.5%
3rd	8.8%
4th	1.4%

Manager Excess Returns (vs Russell 2000® Value)

	<u>Number of Managers</u>	<u>Asset-Weighted</u>	<u>Equal-Weighted</u>	<u>Median</u>
1998	113	0.5	2.4	1.6
1999	130	9.1	11.1	7.6
2000	141	-5.0	-4.4	-4.3
2001	162	2.9	2.4	1.7
2002	180	0.3	0.5	1.0
Average		1.6	2.4	

Future Excess Performance of "Popular" Managers (vs Russell 2000® Value)

	<u>Number of Managers</u> ¹	<u>Average Future 1-Year Performance</u>		<u>Average Future 3-Year Performance</u> ³	
		<u>Popular Manager (Top Quartile)</u>	<u>Rest of Manager Universe (Quartiles 2-4)</u>	<u>Popular Manager (Top Quartile)</u>	<u>Rest of Manager Universe (Quartiles 2-4)</u>
1998	107	7.4 ²	10.9	3.0	2.5
1999	121	-6.6	-4.5	-1.3	-0.1
2000	131	0.2	3.0	-0.4	1.9

Notes: Excess returns are gross of manager fees. "Popular" managers are the top quartile of managers ranked by the market-adjusted dollar change in assets.

¹ See "Methodological Notes" for details on survivorship bias.

² This is the 1999 equal-weighted return for the managers adding the most assets (net of market returns) in 1998.

³ Two-year performance for the 2000 managers.

APPENDIX

METHODOLOGICAL NOTES

Are Attempts to Upgrade Managers Successful?

Those fired represented 92 products and 67 managers, while those hired represented 81 products and 61 managers. In cases where more than one manager was fired and only one manager was hired (consolidation) or the reverse (diversification), the returns were blended, and this was treated as one pair. There were five consolidations and eight diversifications in the sample. In four instances institutions had two accounts that fired a manager at the same time (e.g., an endowment and pension fund). These were only included once to avoid double counting.

All fire/hire dates were adjusted to the end of the prior quarter, under the assumption that implementation of a manager change may take several weeks after a decision is made, and because our database uses quarterly returns. The returns were calculated three years prior to this date, one year prior, one year after, and three years after. Returns are provided for both the fired and new manager in all possible time periods. However, due to factors listed below, there are some discrepancies in the number of observations. In most cases, composite returns from our database were used, but in some instances where one of the products in the pair was not in our database, Morningstar returns (adjusted for fees) were used. In instances where one of the products in the pair was neither in our database nor in Morningstar's, but the strategy had been confirmed by the consultant, returns from the institution's historical performance report were used (fired manager returns prior to the termination or hired manager returns after the hiring). In several cases, the manager was hired less than three years after the product's inception, so prior three-year returns are not available. Of the 103 firings, we did not have one-year post performance for six pairings and three-year post performance for seven pairings. These represented discontinued funds or smaller managers that did not supply returns for our database and did not offer similar mutual funds. In addition, manager changes after March 31, 2000 do not reflect post three-year returns.

Despite some differences in index preferences by managers, all returns for each asset class were compared to the following indices:

Core Equity	S&P 500
Emerging Markets	MSCI Emerging Markets Free
Fixed Income	Lehman Brothers Aggregate
High-Yield	CSFB High Yield
International Equity	MSCI EAFE
International Small-Cap	MSCI EAFE Small-Cap
Large-Cap Growth	Russell 1000® Growth
Large-Cap Value	Russell 1000® Value
Mid-Cap	Russell Mid-Cap™

Mid-Cap Growth	Russell Mid-Cap™ Growth
Mid-Cap Value	Russell Mid-Cap™ Value
REITs	Wilshire Associates Real Estate Securities Index
Small-Cap	Russell 2000®
Small-Cap Growth	Russell 2000® Growth
Small-Cap Value	Russell 2000® Value

The Fate of Popular Funds

For each year, the universe includes all managers in our database as of the beginning of that year (i.e., excluding managers added later) that remained in the database for the next *four* years, allowing for one- and three-year returns *following* the year of calculated capital flows. However, due to database limitations, some managers that liquidated later may have provided backfilled data for the time period examined.

"Popular" managers are the 25% of managers in each year with the greatest absolute increase in assets, adjusted by market returns. For example, we multiplied the December 31, 1997 assets by the 1998 returns and subtracted this from the December 31, 1998 assets to get a proxy for 1998 new assets. We then ranked all of the managers in our database on December 31, 1997 that had returns through December 31, 2001 by assets gained in 1998. We then compared the 1999 and 1999-2001 returns of these popular managers against those of the remaining 75% of the universe.

Any study of this kind will suffer from a survivorship bias as smaller managers that perform poorly either liquidate or stop providing returns during a year. This affected approximately 15% to 20% of managers over each of the three-year periods studied. A survivorship bias raises the return to the less popular managers above the "true" return to the investment options available at the beginning of the period. However, it should be noted that the popular manager group also was affected by the loss of managers, so this mitigates the bias somewhat. The smaller asset classes, REITs and emerging markets, did not lose many popular managers, but in U.S. small-cap and global ex U.S. about 10% of the popular managers disappeared over time. The managers lost over time due to survivorship issues are listed on the following page:

Survivorship Summary

Popular manager analysis year	1998	1999	2000
Time period	3 years	3 years	2 years
Emerging Markets			
Popular managers lost	1	0	0
Unpopular managers lost	9	9	7
Total managers	56	59	65
Survivorship bias	18%	15%	11%
Survivorship bias popular	7%	0%	0%
Survivorship bias unpopular	21%	20%	14%
Global ex U.S.			
Popular managers lost	3	2	4
Unpopular managers lost	24	31	20
Total managers	130	137	154
Survivorship bias	21%	24%	16%
Survivorship bias popular	9%	6%	10%
Survivorship bias unpopular	25%	30%	17%
REITs			
Popular managers lost	0	0	1
Unpopular managers lost	5	7	6
Total managers	24	27	32
Survivorship bias	21%	26%	22%
Survivorship bias popular	0%	0%	13%
Survivorship bias unpopular	28%	35%	25%
Small-Cap Growth			
Popular managers lost	3	4	5
Unpopular managers lost	22	20	14
Total managers	113	127	152
Survivorship bias	22%	19%	13%
Survivorship bias popular	11%	13%	13%
Survivorship bias unpopular	26%	21%	12%
Small-Cap Value			
Popular managers lost	3	2	2
Unpopular managers lost	18	16	5
Total managers	107	121	131
Survivorship bias	20%	15%	5%
Survivorship bias popular	11%	7%	6%
Survivorship bias unpopular	22%	18%	5%

The Fate of the Largest Managers

The asset-weighted and equal-weighted return comparison examines five distinct years. For each year, the universe includes all managers in our database as of the beginning of that year that remained in the database for the full year. By excluding managers added later, we avoid a possible upward bias. For example, the 1998 calculation includes all managers with both product assets as of December 31, 1997 and 1998 returns. The universe is the same for each calculation at each point in time. For the asset-weighted return, the December 31 weights of the prior year-end are used. We made year-by-year rather than full-period calculations in order to reduce survivorship bias.