Why active fund managers often underperform the S&P 500:
The impact of size and skewness

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Abstract

The performance of actively managed U.S. equity funds is often naively compared to that of the S&P 500 index. In recent years, this comparison has generally cast an unfavorable impression of active fund managers and has led many investors to embrace index funds.

Systematic deviations from the benchmark are affected by two conventional practices of active fund managers: 1) equally-weighting their positions, and 2) holding small numbers of stocks. These two practices accentuate the statistical characteristics of longer-horizon stock returns and cause active manager performance to deviate predictably from broad-based benchmarks such as the S&P 500.

We show that the size-premium (the tendency for small capitalization stocks to outperform large ones), even among S&P stocks, works to the advantage of investors who hold equal-dollar-amount positions. The size premium is not stable, and in recent years when large-cap stocks outperform small cap-stocks, equal-weighted portfolios have worked to the disadvantage of active investors.

Cross-sectional skewness of the component annual returns of the index provides a more subtle bias. Because of (right-tailed) skewness, the "typical" median stock underperforms the mean stock return. When skewness is positive, even if managers *randomly* draw firms from the index that they are compared to, they will generally underperform unless they are endowed with some information advantage. Similar to the size-effect, the impact of skewness on performance varies over time, but generally works to the disadvantage of active investors who hold a smaller number of issues. On average, the impact of cross-sectional skewness appears to be about 20 basis points per annum for investors who hold 35 equal-dollar positions, and even more for less diversified portfolios.

These two issues, the size-premium and skewness, appear to provide an alternative motivation (aside from reasons of cost) as to why active fund managers or investors underperform passive benchmarks such as the S&P 500. Moreover, these two factors also explain why managers do well in some years.

I. Introduction

The performance of active money managers of U.S. equity funds is regularly compared to the S&P 500 index. Whether such a naive comparison is appropriate is certainly questionable.[1] Yet such comparisons, be they in the popular press or otherwise, occur regularly. For a randomly chosen manager, deviations from a broad benchmark such as the S&P 500 are expected. However, when managers as a group are evaluated, one should not expect their performance to deviate too far from their "normal" benchmark, particularly if we presume that managers, by and large, do not possess abnormally inferior or superior skills. Nevertheless, the empirical record of manager performance suggests otherwise. The performance of active fund managers as a class deviates substantially from the S&P 500 in surprisingly systematic ways. In recent years, such comparisons with the S&P 500 have painted a rather unfavorable impression.[2] Yet this relationship varies substantially over time, much more than one might imagine if managers were drawing portfolios without bias from some underlying universe.

Several explanations have been offered as to why managers fare poorly relative to a passive index. Clearly, active managers face search and trading costs that passively managed funds do not bear. Furthermore, fund managers face costs associated with servicing investors and fulfilling an intermediation function through meeting redemption needs. Together, these costs create an overall "drag" on performance. To overcome this, managers need information. If active managers as a group do not possess superior information, or alternatively if they cannot efficiently use this information, one should not be surprised to observe actively managed funds underperforming a passive benchmark such as the S&P 500.[3]

Surely these cost factors explain some portion of performance of active managers vis-à-vis an unmanaged index. See Gruber (1996). On the other hand, costs alone cannot explain the differences observed between the typical money manger and the S&P 500 index from one year to the next. If cost-related issues were the predominant factor, active managers as a group would tend to underperform the S&P consistently over time. Such consistency is not evident in the data. Moreover, in some years managers as a group *outperform* the S&P 500, occasionally by rather impressive amounts.

Of course, another possibility is simply that managers, as a group, tend to hold stocks whose performance departs from the broader market average. In essence, active managers are collectively taking "bets." While "herding" tendencies may exist among managers (see Grinblatt,

Titman and Wermers, (1995)), this is not the focus of this paper.

In this paper, we examine two characteristics of long-run stock returns that together have some power to explain the relative performance of active managers as a group. Additionally, we examine how these deviations might arise while imposing the restriction that managers only hold S&P 500 stocks. One might imagine that imposing such a "zero-sum" restriction would force the performance of the median manager to match the S&P 500. However, we demonstrate that this is not so using simulated portfolios, and we show that median manager portfolio returns can deviate from a passive benchmark with surprising regularity.

The first of these two issues relates to the long observed tendency of small stocks to outperform -- what is often referred to as the "size-premium." While the existence of a size-premium has been debated for some time, its impact on the relative performance of active managers, by and large, has not been considered. The second issue is "skewness" in long-run stock returns. That is, the propensity for the distribution of the component returns, in any given year, to be asymmetric. Skewness in most years tends to be positive (right-tailed) and harm the relative performance of managers, but its impact varies from year to year.

The remainder of the paper is as follows. Section II describes the size premium and Section III the skewness bias in active management of stocks. In Section IV, we provide evidence on the skewness in historical returns of S&P 500 stocks over the period 1962 to 1995. In section V, we conduct simulations to illustrate the potential bias managers face by drawing portfolios from the S&P 500. Here, we estimate the impact that size and skewness have on relative portfolio performance. Conclusions are reported in the last section of the paper.

II. The small stock premium

With a few exceptions, most of the popularly quoted benchmarks like the S&P 500 are value-weighted. The implied investment strategy in these benchmarks is to purchase amounts proportional to each component stock's market capitalization. Consequently, large-cap stocks drive a substantial portion of the benchmark’s risk and return characteristics.

The difference in implied weights between small- and large-stocks in a value-weighted index is remarkably extreme. Suppose one chose to invest in a portfolio of the three largest and three smallest stocks in the S&P 500. Using an equal-weighted investment strategy, each of the six stocks would receive the same dollar investment. However, if a value-weighted portfolio is

formed, for every dollar invested in the three smallest stocks, one would need to invest nearly $400 in the three largest stocks (using market values from the end of 1997). Such extreme capitalization-weighted portfolios are atypical of active fund mangers actual practices.

When one aggregates the actions of individual managers, a small-cap tilt is evident in overall fund performance. This tendency will appear even if managers as a group are *not* herding toward smaller-cap stocks. Thus, if one compares the performance of the median, or "typical," fund manager to a value-weighted index, the risk-return characteristics of actively managed portfolios will be explained to some extent by differences in how small and large stocks perform.

We show that size has historically been an important determinant of cross-sectional stock returns. Thus, implicit differences between manager investment weights and the underlying benchmark to which they are compared will lead to predictable deviations between managers as a group and the benchmark. The relation between active fund performance and the size-effect has been observed in literature. For example, Daniel, Grinblatt, Titman and Wermers (1997) report that mutual fund performance is associated with the CRSP equal- and value-weighted indices, generally falling in between the two indices each year. They attribute this to managers holding a greater proportion of small-cap stocks. While managers likely hold some smaller stocks that are not in the benchmark, our point is that one will still observe a size-effect in relative manager performance even if managers are restricted to holding stocks in the index but tend not to value-weight their holdings.

III. The skewness bias

The impact of the size-premium on the relative performance of active fund managers is straightforward. However, a second subtler factor why managers deviate from the S&P (usually leading to underperformance) relates to the underlying statistical nature of long-run stock returns. Over short horizons such as a day or even a week, the cross section of stock returns is close to Gaussian or “normal” (distributions that are symmetric or bell shaped). Yet over longer horizons such as a year, this symmetry disintegrates. In nearly all years, the cross-section of individual stock returns exhibits considerable right-skewness. This occurs for two reasons. First, limited liability truncates equity returns (for long positions) to -100%. Second, upside returns are unbounded and, in any given year, several individual stocks will record extraordinary performance. It is not unusual to observe the price of ten or more of the 500 issues in the S&P

more than double in a year.

This asymmetry is problematic for money managers precisely *because* they hold a small subset of the index's component stocks. One can imagine their portfolios coming from a limited number of "typical" draws from an underlying distribution. If the cross-section of long-horizon stock returns is positively skewed, the typical stock (or median stock) will underperform the mean of all stocks together. In short, the typical stock will appear to *underperform* an (equal-weighted) index of all the stocks together. This problem is aggravated as skewness increases, when a higher proportion of stocks underperforms the overall average. Even if active money managers *randomly* draw a subset of stocks from this pool (thus exhibiting no stock picking prowess), the median manager will tend to draw a portfolio that underperforms the index. This bias handicaps the median active fund manager even before costs and other factors are considered.

To illustrate this notion more clearly, consider the following simplified example that resembles a fair lottery payoff. Suppose you have a 500-stock index and, at the beginning of a year, fund managers draw 50 stocks from this index to form their portfolios. Let's also assume that managers draw without any stock picking skill. Suppose finally that over the course of the year, 499 of the firms in the universe produce identical returns of 0% while the 500th firm (comprising only 1/500th of the index) has an outstanding year with a return of 500%. The total return to the "broad index" will be 1%. Moreover, 499 of stocks in the universe will appear to underperform the benchmark; one firm will appear to have extraordinary performance. At the end of the year, there will be two types of managers: those who were lucky enough to draw the winning stock, and those whose who were less fortunate. The "winners" for the year will "beat the market" with portfolio returns of 10% (.02*500%), while "loser" managers will underperform the benchmark with portfolio returns of 0%. As a group, the vast majority of managers (90%) are underperforming the market.

Such an example is unrealistic. However, it vividly illustrates the potential impact that positive skewness might have on median manager performance. Cross-sectional skewness tends to be positive (more extreme high returns than extreme low returns). Thus, in most years, skewness works against managers with finite holdings. However, skewness in cross-sectional stock returns is not constant year-to-year.

We should and do observe portfolio managers underperforming broad indices such as the S&P 500 when individual stock returns are positively skewed. The bias is particularly onerous for

portfolios with limited numbers of holdings. This underperformance arises before the assumption of costs, trading or otherwise, that clearly burden active managers. Moreover, these results are not the consequence of unusual behavioral tendencies or asset allocation strategies that fund managers might have.

IV. Size and skewness biases, 1962-1995

We begin by reviewing the characteristics of annual stock returns for individual stocks over the period 1962 to 1995. Throughout the paper we focus only on stocks in the S&P 500 because of the prevalence of this index in the money management community. Moreover, this constraint directs our examination away from less liquid stocks, instead favoring those stocks in which money managers trade most actively.

At the beginning of each year, we identify the firms included in the S&P 500 and obtain the annual total return for each stock. For each year, the initial index composition is held constant. If an index firm ceases trading for any reason such as a bankruptcy or takeover, the return for that stock is calculated to the day of departure. From that day until year-end, the position is assumed to earn the overall S&P index return.

Table I reports distributional characteristics for individual S&P 500 component stocks year by year from 1962 to 1995, as well as for all years pooled together. For comparative purposes, the concurrent S&P 500 index return is provided.[4] For years 1975 to 1995, we also report median portfolio returns for actual fund managers. These fund returns were obtained from DeMarche Associates from their database of "Core" managers.[5] These core managers are restricted to a large-cap investment style. Therefore, their performance is legitimately compared to the S&P 500. This particular data series is attractive because it contains all of the managers DeMarche followed, including non-survivors.

In 31 of the 34 years, the mean return for individual component stocks in the S&P 500 exceeds the median return, a result consistent with positive skewness. When pooled over all years, the difference between the mean and the median stock is nearly +4%.

[Table I and Figure 1 about here.]

The middle columns of Table I report the cross-sectional standard deviation, skewness and kurtosis observed each year for the 500 S&P component stocks. Just as there is substantial variation in the mean and median stock return, there is also variation in these higher statistical

moments. The relationship between the mean-median return spread and cross-sectional skewness is summarized in Figure 1. With the exception of 1974 and 1992 where two extraordinary outlier returns arise[6], there is generally a strong relationship between the mean-median return difference and skewness. As skewness increases, the spread between the mean and median return widens.

The skewness in any given year is also related to the cross-sectional standard deviation. Thus, as return skewness in any given year increases, standard deviation rises as well. This pattern is evident in Table I. In years where high cross-sectional skewness is observed, above-average standard deviation is also observed. Similarly, we find above average kurtosis in years where standard deviation and skewness are high.[7] Conversely, when skewness is lower, standard deviation and kurtosis tend to be lower. In these years, the mean-median return difference is smaller or even negative.

V. Portfolio Simulations

Our goal is to measure the extent to which two simple institutional practices of fund managers (or, typical investors) affect median fund manager performance relative to a broad benchmark such as the S&P 500: 1) portfolios with approximate equal investment weights and, 2) a limited number of stocks.

We do this by simulating hypothetical portfolios using the same S&P 500 returns used earlier in Table I. Of course, S&P 500 stocks are not the only stocks active managers hold. However, this setting allows us to isolate the skewness bias while eliminating the effects that other issues such as fund costs, manager timing or stock picking skills might have on fund performance.

a. The portfolio random draw procedures and data

For each year between 1962 and 1995, we determine which firms were included in the S&P 500 and obtain their returns as described earlier. For a given year, we calculate each firm's appropriate market capitalization weight and calculate the benchmark return. This is the "index" return shown on Table I, which we use in our simulations to measure excess manager performance.[8]

At the beginning of each year, we assume that managers form buy-and-hold portfolios only from S&P 500 stocks. For a given portfolio, we randomly draw without replacement a set

number of stocks from the S&P 500 universe to form a portfolio. For each year, 5,000 random hypothetical portfolios are formed. Treating each portfolio as a "manager", we then examine both the mean and median manager returns and compare performance to the passive S&P 500 return.

Key considerations are the number of stocks a manager is assumed to hold, the likelihood a stock is chosen, and the investment weights a manager is expected to employ. Generally speaking, active managers hold a limited number of securities. Thus we evaluate portfolios with various numbers of S&P stocks: 15, 25, 35, 50, 75, 100 and 150 stocks.

We randomly generate our simulated portfolios in three ways. First, we compose portfolios assuming equal probabilities and equal weights; that is, we assume that each stock has the same chance of being chosen and, once chosen, each stock, regardless of market-cap, receives an equal dollar investment. Next, we form portfolios assuming that all S&P stocks have an equal probability of being chosen, but once a portfolio is identified, a value-weighted investment is followed; that is, the proportion of the portfolio invested in each stock is relative to its market capitalization. While this approach essentially assumes that all stocks have roughly similar institutional ownership, it imposes the rather restrictive assumption that managers invest in a true value-weighted approach -- a rather extreme assumption. As a final alternative, we report portfolios that assume equal investment weights, but alter the probability that a stock is randomly chosen to reflect value-weighted probabilities. In this strategy, firms like Exxon and General Electric are more likely to appear in manger portfolios, but do so with equal investment weights. This approach preserves equal investment weights, but is consistent with the idea that managers are more inclined to hold larger stocks which receive greater following from sell-side analysts. These stocks are also familiar to managers, often have greater liquidity and are perhaps easier to monitor.

Ideally, the preferred portfolio formation approach is the one which best describes manager behavior. Of course, no single approach can adequately describe all managers. However, among the three approaches being considered, the equal-weighted probability, equal weighted investment strategy seems most appealing for at least two reasons. First, between 1975 and 1995, this simulation technique had the highest correlation (ρ= .40) with DeMarche's core manger performance data, far greater than with more value-weighted strategies.[9] Second, we were able to obtain portfolio holdings information for 39 of DeMarche's 237 core managers as of year-end 1996. The median investment weight across these managers averaged 1.8%.

Interestingly, the upper quartile weight was only slightly larger than median, 2.3%, while the lower quartile weight was only slightly lower than median, 1.3%. While these weights show some variance, they are far more consistent with an equal-weighted investment approach than a value-weighted investment strategy.

[Table II about here.]

We simulate 5,000 portfolios under each of the three strategies for every year. Because of space limitations, we focus attention on those trials where portfolios are formed using 35 issues. Table II reports the mean difference in total return between manager portfolio returns and the S&P 500 index. The median return difference is also reported. We refer to these as "return deviations" where a positive number signifies managers performing above the index benchmark. Next, we label the difference *between* the median and mean return deviations as the "*Diff*."

b. The size-effect and its impact on the relative performance of active managers

Table II shows that from one year to the next, our simulated mean and median manager returns relative to the S&P 500 index vary substantially. Recall that these are randomly formed portfolios and are not affected by other factors such as informational or cost advantages or disadvantages. Focusing on the equal/equal portfolios (equal weighted probabilities and equal dollar investments), median fund returns significantly outperform the S&P index in certain years, while underperforming in others. In 1968, 100% of the 5,000 bootstrap portfolios formed using the equal/equal approach outperformed the S&P 500 and the median, or typical, manager's return exceeded the index by a remarkable 13.53%. Yet during the following year, this same approach led 99% of the portfolios to underperform the S&P; the median portfolio underperformend the index by -8.70%.

These big deviations are driven by a "size-effect." While academics often consider the size effect within the context of much smaller stocks relative to the largest stocks in the market place, a size-effect is clearly measurable even within S&P 500 stocks, which are relatively large. The equal/equal portfolios accentuate the impact of the size-effect because they reflect small stocks and their return characteristics, unlike the S&P benchmark. It is not too surprising that this set of portfolios displays the greatest variation in tracking error relative to S&P 500 over time.

On average, the size-premium favors small-cap stocks. An equal weighted probabilities/equal investment weights approach generates mean excess manager returns of 282

basis points per year, substantially more than either the value/equal portfolios (with value weighted probabilities and equal dollar investments, where the mean return deviation is only 32 basis points) or the equal/value portfolios (equal weighted probabilities and market cap-weighted investments, 23 basis points). In both of these latter cases, tracking error with respect to the S&P is low. In the first case, this is achieved because the portfolios tend to hold larger stocks. In the second case, this occurs because although large and small stocks are equally likely to be held, large stocks receive an extreme investment weight.

The size-premium (the tendency of small stocks to outperform large capitalization stocks) is one of the most important factors affecting the simulated portfolios above. The fact that the mean and median return deviations relative to the S&P 500 over time is not zero reflects the impact of the size premium during this period. However these excess portfolio returns vary substantially over time as illustrated in Appendix A. There, all S&P 500 stocks are sorted into capitalization deciles at the beginning of each year. A "size-premium" is reported for each year on the right-hand side and is estimated using OLS regression. This premium represents the average change in return for moving one decile toward a smaller S&P decile group.

Even among individual S&P firms, the relatively smaller stocks tend to outperform the relatively larger S&P stocks over the period 1962 to 1995. Year to year, the size premium changes and these premium changes are consistent with the bootstrap portfolio returns reported in Table II. For example, in 1967 and 1968, the bootstrap portfolios using equal/equal approach easily outperformed the S&P 500. In these same years, small stocks outperformed large stocks by wide margins. Likewise, in 1989 and 1990 and again later in 1995, the reverse was true as large stocks outperformed small stocks and the same portfolio approach lead to underperformance relative to the S&P. To the extent that managers tilt their portfolios toward equal weighting, the evidence would suggest that a substantial portion of manager excess performance relative to the S&P 500 is affected by the magnitude of a size premium across stocks.

c. The impact of skewness on the relative manager performance

The impact of skewness on portfolio performance can be measured by focusing on the difference between the mean and median manager returns, or *Diffs*. As skewness increases, random portfolios will occasionally draw stocks with extremely high returns. This will, in turn, increase the mean portfolio return relative to the median, or "typical" portfolio, which is largely

unaffected by skewness.

In any given year, the mean-median spread depends on the prevalence of skewness in the underlying universe. On average, the highest *Diff* comes from the equal/equal strategy (choosing stocks with equal probabilities and employing an equal-weighted investment strategy). Just as a return premium is evident across size, skewness also differs across size groups as well, with smaller stocks tending to display greater skewness. Appendix B reports skewness by size decile over time. Large-cap firms are proportionately more prevalent in the two value-weighted approaches. Because such firms tend to have lower skewness, the variability in *Diff* is smaller in magnitude for these two portfolio strategies.

Focusing on the equal/equal approach for portfolios of 35 stocks, we see that the impact of skewness contributes to underperformance for the typical, or median, manager of 22 basis points per year. Interestingly, this bias fluctuates over time. In 1974, the bias amounts to 132 basis points, yet in 1981 the skewness worked *to* the advantage of managers and contributed 7 basis points to performance.

[Table III about here.]

d. Summarizing the impact of skewness and size relative manager performance

Regressions in Table III summarize the impact of skewness. Here, the dependent regression variable is *Diff*, or the difference between the mean and median manager portfolio returns in a given year. As before, we focus on equal/equal portfolios of 35 stocks. Earlier, we observed that cross-sectional skewness in individual stock returns as well as standard deviation and kurtosis affect this return spread. Thus these variables are also included in the regression. As a control, we also include the size-premium reported in Appendix A

Setting aside the rather extraordinary years 1974 and 1992[10], the regression evidence indicates that the mean-median difference is indeed largely associated with cross-sectional skewness and standard deviation. When these two variables are used together, both have power. The same is not true of kurtosis. Interestingly, the mean-median return difference is not materially associated with the size-premium. Evidently, this portion of the bias that managers faced is restricted to only the prevalence of cross-sectional skewness and is not affected by the relative performance of small- and large-cap stocks.[11]

[Table IV about here.]

In Table IV, we shift our attention to the impact of the size-premium as well as skewness

on overall manager performance, again using regression analysis. Here, the dependent variable is median manager excess performance relative to the S&P 500. In Panel A, we estimate the impact of skewness and the size-effect using simulated manager returns over the total period, 1962-1995. In Panel B, we use the shorter time-series of actual large-cap portfolio returns from DeMarche's database of core fund managers available over the period 1975 to 1995.

Regarding skewness, we see some evidence of its adverse affect on overall manager performance. In Panel A, the regression coefficient on skewness, though not significant in a statistical sense, is negative as we hypothesized. This is consistent with increased skewness harming relative manager performance. Using actual manager returns in Panel B, the impact of skewness is more evident. Here, the coefficients on both standard deviation and skewness are negative, and both variables are significant or marginally significant at traditional confidence levels.

Turning to the size-premium, we see that size has extraordinary impact on manager excess performance relative to the S&P. Using both simulated manager returns as well as actual manager returns, size has a positive and highly significant regression coefficient. As small stocks outperform large stocks, active fund managers tend to perform better relative to the S&P.[12] Given the divergent investment strategies between what we observe managers doing in contrast to implied weights in the S&P, the significant impact of size is not entirely unexpected.

Some caution should be exercised in interpreting this evidence. However, the consistency between our hypothesis and simulations of the impact of skewness and size and its measurement in actual mangers' deviations from the S&P is significant and important. In fact, using proxies for these two factors, we explain 50% of the variability in *actual* manager excess annual portfolio returns. In our simulations, over 90% of the variability in excess portfolio returns was explained.

e. The decreasing impact of skewness as the number of holdings increase

We have shown that positive cross-sectional skewness in the distribution of individual stock returns presents a negative drag on active portfolio managers. However this bias should, in theory, decline as the number of issues held in a portfolio increases. The reasoning is simply that while managers will continue to draw the "typical" stock (which shows inferior performance relative to the index in the presence of skewness), by drawing more stocks, managers have an increased likelihood of drawing one of the few extreme winners.

The evidence in Table II provided an estimate of the impact of skewness for managers holding 35-stock portfolios. An interesting question remains as to what impact skewness might have for other either more or fewer holdings. For private investors, this issue is quite important since it is quite common for private investors to hold portfolios of fewer than 35 stocks. Thus, we ask how many stocks are sufficient to effectively eliminate the influence of skewness.

[Table V and Figure 2 about here.]

In Table V, we report the mean-median manager return spread observed under various scenarios, ranging from 15 to 150 stocks in a portfolio. This is replicated across the three investment approaches used in this paper. The bias report in this table for each portfolio combination is also plotted in Figure 2. The results are as expected: the impact of skewness is extreme for portfolios with few stocks. Moreover, the impact of skewness decreases dramatically and in a non-linear fashion as more issues are held. For investors holding only 15 issues, the bias is about 40 basis points per year, but for portfolios of 75 issues, the bias under each of the three portfolio approaches is, on average, under 10 basis points.

V. Conclusion

The performance of active fund managers is frequently compared to that of the S&P 500 index. We show that at least two factors affect this naive comparison. First, the size-premium from year to year is an important determinant of relative manager performance. While some have argued that this occurs from the propensity of managers to hold small-cap stocks, we show that a size-effect can be significant even if managers hold only relatively large (S&P 500) stocks. The general tendency of managers to invest equal dollar amounts in their holdings (in comparison to actual capitalization weighting as used in the underlying index) in most years leads to a return comparison benefiting managers. Yet the premium that small-cap stocks earn is not stable over time. In some years, large-cap stocks outperform small-cap stocks, such as occurred in the mid-1990s, and, as a result, money managers as a group did poorly.

Second, we also illustrate the impact of skewness on investment performance for portfolios that hold a limited number of stocks. Cross-sectional skewness in component stock returns tends to produce a drag on the returns of investors who hold a small number of stocks, even when simply drawing from stocks included in the underlying benchmark. This drag represents another "cost" incurred by active investors attempting to outperform passive

benchmarks and is particularly significant for portfolios that hold 35 stocks or less. For funds which hold more than 35 stocks, the negative impact of skewness decreases although the impact still measurable for portfolios with as many as 150 stocks.

Other studies have shown that active investors gain substantial diversification benefit from creating portfolios with larger numbers of securities (Statman (1987)). These previous studies make this argument from the standpoint of reducing unsystematic risk. Our findings add an additional reason to encourage active investors to construct portfolios with larger numbers of holdings.

References

Chen, Zhiwu and Peter J. Knez, 1996, "Portfolio Performance Measurement: Theory and Applications," *Review of Financial Studies* 9, 511-556.

Christopherson, Jon, Wayne E. Ferson and Debra A. Glassman, 1996, Conditioning Manager Alphas on Economic Information: Another Look at the Persistence of Performance, NBER working paper #5830.

Daniel, Kent, Mark Grinblatt, Sheridan Titman and Russ Wermers, Measuring mutual fund performance with characteristic-based benchmarks, *Journal of Finance* 52, 1035-1058.

Desai, Hemang and Prem C. Jain, 1997, "Long-run common stock returns following stock splits and reverse splits," *Journal of Business* 70, 409-434.

Grinblatt, Mark and Sheridan Titman, 1993, "Performance Measurement without Benchmarks: An examination of mutual fund returns," *Journal of Business*, 47-68.

Grinblatt, Mark, Sheridan Titman and Russ Wermers, 1995, "Momentum Investment Strategies, Portfolio Performance, and Herding: A Study of Mutual Fund Behavior," *American Economic Review*, 1088-1104.

Gruber, Martin J., 1996, "Another Puzzle: The Growth in Actively Managed Mutual Funds," *The Journal of Finance* 51, 783-810.

Ferson, Wayne E. and Vincent A. Warther, 1996, "Evaluating Fund Performance in a Dynamic Market," *Financial Management*, November/December, 20-28.

Ikenberry, David, Josef Lakonishok and Theo Vermaelen, 1995, "Market Underreaction to Open Market Stock Repurchases." *Journal of Financial Economics*, 39, 181-208.

Ikenberry, David L., Graeme Rankine and E. Kay Stice, 1996, "What do stock splits really signal," *Journal of Quantitative and Financial Analysis* 31, 357-375.

Lakonishok, Josef and Theo Vermaelen, 1990, "Anomalous price behavior around repurchase tender offers," *Journal of Finance* 45, 455-477.

Loughran, Tim, and Jay R. Ritter, 1995, "The New Issues Puzzle," *Journal of Finance* 50, 23-51.

Malkiel, Burton G., 1995, "Returns from investing in equity mutual funds 1971 to 1991," *Journal of Finance*, 549-572.

Michaely, Roni, Richard H. Thaler and Kent L. Womack, 1995, "Price Reactions to Dividend Initiations and Omissions: Overreaction or Drift?" *Journal of Finance* 50, 573-608.

Statman, Meir, 1987, "How Many Stocks Make a Diversified Portfolio?" *Journal of Financial and Quantitative Analysis* 22, 353-364.

Womack, Kent, 1996, "Do brokerage analysts' recommendations have investment value?," *Journal of Finance* 51, 137-167

Table I
The Distributional Characteristics of the Annual Returns for S&P 500 Stocks

Table 1 reports the statistical properties of the annual total returns for individual stocks included in the Standard and Poor's 500 index. Total returns are calculated for all firms in the index at the beginning of each year. Stocks which cease trading during the middle of a year are held until they are dropped from the index, the proceeds of which are assumed to be invested for the remaining portion of the year in the S&P 500 index. These annual returns are summarized by the mean, median, the difference between the mean and median, cross-sectional standard deviation, skewness and kurtosis. For comparative purposes, a value-weighted portfolio return is also reported and labeled S&P 500 "index" return. Because of the investment assumption for partial-year stocks, this return will deviate slightly from the index return reported by Standard and Poor's. This evidence is reported on a year-by-year basis as well as for all years pooled together. The far right column provides the median portfolio return for a large sample of actual "core" (large-cap) managers for a 21-year period.

Year	Mean Return- All Stocks	Median Return- All Stocks	Mean-Med. Difference	Standard Deviation	Skewness	Kurtosis	S&P 500 "Index" Return	Median Actual Core Manager Returns
1962	-11.64	-12.46	0.82	17.88	0.20	0.31	-8.65	
1963	23.41	20.01	3.40	26.61	1.75	7.99	22.38	
1964	19.08	16.06	3.02	24.38	1.25	3.37	16.70	
1965	25.06	16.64	8.42	34.43	2.31	11.78	12.51	
1966	-9.68	-11.51	1.83	19.79	1.60	8.20	-10.27	
1967	36.92	25.32	11.60	42.84	2.36	9.10	23.53	
1968	24.90	20.38	4.52	30.13	1.17	2.91	11.13	
1969	-16.91	-18.68	1.77	22.77	0.42	0.11	-8.24	
1970	4.04	5.07	-1.03	26.29	0.22	1.61	4.28	
1971	16.98	12.56	4.42	29.92	1.08	3.43	14.42	
1972	10.43	8.22	2.21	26.25	0.53	1.01	19.14	
1973	-18.31	-22.20	3.89	37.17	2.11	8.32	-14.46	
1974	-21.27	-25.71	4.44	42.37	9.45	148.34	-26.34	
1975	53.83	46.10	7.73	47.19	1.67	7.75	37.24	35.41
1976	34.28	29.60	4.68	30.65	1.19	3.11	23.82	27.01
1977	-1.73	-2.64	0.91	22.37	1.59	7.48	-7.43	1.40
1978	8.26	3.96	4.30	24.73	1.63	5.57	6.39	9.10
1979	29.50	18.61	10.89	39.51	2.44	10.86	18.07	22.22
1980	30.04	20.95	9.09	39.30	1.58	4.07	32.09	27.12
1981	5.00	3.96	1.04	28.54	0.59	0.97	-4.70	6.09
1982	30.77	29.78	0.99	45.30	1.84	12.18	21.56	25.95
1983	29.61	25.75	3.86	30.47	0.89	2.01	22.64	23.32
1984	3.31	3.60	-0.29	25.88	0.41	1.38	7.06	7.97
1985	31.09	30.35	0.74	32.08	0.32	1.60	31.69	30.13
1986	17.30	15.80	1.50	30.27	0.41	1.57	18.38	19.97
1987	4.75	1.03	3.72	30.36	1.26	3.90	5.00	9.49
1988	21.14	16.21	4.93	32.70	2.23	9.64	17.07	17.12
1989	27.55	27.52	0.03	31.65	0.22	0.91	31.23	26.35
1990	-11.17	-8.79	-2.38	25.63	-0.34	0.38	-3.19	0.13
1991	36.29	30.30	5.99	43.86	1.42	4.42	30.64	29.89
1992	14.92	11.27	3.65	36.52	4.51	48.42	7.63	9.44
1993	14.63	10.52	4.11	31.03	1.69	6.40	9.90	11.84
1994	0.65	-0.99	1.64	22.78	1.14	3.55	1.40	0.97
1995	32.30	31.50	0.80	31.32	0.59	3.05	37.38	31.55
Pooled - All years	14.57	10.65	3.92	36.88	1.72	13.02	11.77	n.a.

Table II
Simulated Manager Excess Performance (in %) Relative to the S&P 500

We compute 5,000 simulated manager portfolios containing 35 stocks each, drawn from the universe of S&P 500 stocks existing at the beginning of the year. Portfolios are formed assuming that the probability of choosing a stock is either equal- or value-weighted and then once the names are chosen, the percentage invested in each stock is either equal- or value-weighted. For these three approaches, the excess annual return of each of the 5,000 portfolios in comparison to the S&P 500 index that year is recorded. Reported below are the mean, median, the difference between the mean and median (in %), and the percentage of portfolios whose excess returns is positive (%+).

	Equal-weighted probabilities								Value-weighted probability			
	Value-weighted style				Equal-weighted Style				Equal-weighted Style			
Year	Mean	Median	Diff	%+	Mean	Median	Diff	%+	Mean	Median	Diff	%+
1962	-0.51	-1.12	0.61	42.60	-2.92	-2.94	0.02	15.60	-0.81	-0.78	-0.03	37.20
1963	-0.79	-1.29	0.50	38.90	1.16	1.06	0.10	59.50	-1.15	-1.34	0.19	32.20
1964	0.28	0.64	-0.36	54.30	2.42	2.26	0.16	72.50	0.24	0.12	0.12	51.60
1965	2.21	2.14	0.07	62.10	12.62	12.26	0.36	99.40	3.02	2.79	0.23	76.90
1966	0.58	1.07	-0.49	56.50	0.54	0.42	0.12	55.10	0.96	0.90	0.06	64.30
1967	0.16	-0.65	0.81	46.00	13.44	13.01	0.42	98.40	0.23	-0.17	0.40	48.50
1968	1.27	0.62	0.65	54.80	13.77	13.53	0.23	99.90	1.62	1.43	0.19	66.10
1969	-1.36	-1.78	0.42	39.60	-8.67	-8.70	0.03	1.00	-1.69	-1.68	-0.01	30.00
1970	0.20	0.42	-0.21	52.50	-0.21	-0.32	0.11	47.30	0.27	0.30	-0.03	53.70
1971	0.75	0.32	0.44	51.90	2.50	2.36	0.14	69.00	1.07	0.92	0.15	60.60
1972	-0.79	-0.85	0.06	43.80	-8.74	-8.75	0.01	2.40	-0.97	-1.01	0.04	39.20
1973	0.19	-0.24	0.43	48.80	-3.87	-4.15	0.28	24.50	0.34	0.23	0.11	52.00
1974	0.19	0.02	0.17	50.20	5.20	3.88	1.32	79.60	0.32	0.24	0.08	52.90
1975	0.60	-0.05	0.65	49.80	16.50	16.33	0.17	98.70	0.92	0.71	0.21	55.20
1976	0.11	0.71	-0.60	54.50	10.37	10.24	0.13	98.60	0.22	0.13	0.09	51.70
1977	-0.30	0.30	-0.33	50.40	5.71	5.46	0.25	94.60	-0.38	-0.49	0.11	42.30
1978	-0.16	-0.04	-0.12	49.70	1.94	1.82	0.12	66.80	-0.28	-0.47	0.19	43.90
1979	2.20	2.65	-0.45	61.50	11.65	11.24	0.41	97.50	2.92	2.79	0.13	72.80
1980	0.05	-0.83	0.89	47.10	-1.93	-2.15	0.22	36.70	0.62	0.47	0.15	53.60
1981	0.51	-0.32	0.84	48.20	9.65	9.73	-0.07	98.10	0.77	0.68	0.09	56.30
1982	0.05	-1.16	1.21	45.00	9.21	8.83	0.38	90.00	0.20	0.02	0.18	50.10
1983	0.16	0.16	-0.01	51.30	6.96	6.95	0.01	92.40	0.14	0.05	0.09	50.50
1984	-0.39	-1.09	0.70	42.60	-3.68	-3.84	0.16	19.70	-0.77	-0.77	0.00	40.70
1985	0.34	0.40	-0.06	53.30	-0.50	-0.61	0.11	45.60	0.42	0.36	0.05	53.30
1986	1.07	2.10	-1.03	63.90	-1.10	-1.17	0.07	40.80	1.41	1.45	-0.04	64.50
1987	-0.16	-0.27	0.11	47.70	-0.43	-0.60	0.17	45.00	-0.18	-0.29	0.11	46.70
1988	0.19	-0.26	0.45	48.00	4.08	3.72	0.36	76.80	0.29	0.07	0.22	50.90
1989	0.58	1.43	-0.85	58.20	-3.61	-3.50	-0.11	24.30	0.52	0.43	0.09	53.90
1990	-0.44	-0.40	-0.04	47.50	-7.97	-7.98	0.01	2.50	-0.63	-0.60	-0.03	43.30
1991	0.47	0.08	0.39	50.40	5.82	5.43	0.39	78.90	0.43	0.30	0.13	52.40
1992	0.57	0.87	-0.30	55.60	7.36	6.64	0.72	91.80	0.67	0.43	0.24	55.30
1993	0.37	0.40	-0.03	52.20	4.63	4.26	0.37	82.10	0.71	0.61	0.10	56.20
1994	-0.16	-0.17	0.01	48.10	-0.81	-0.89	0.08	40.30	-0.16	-0.24	0.08	46.70
1995	-0.23	-0.15	-0.08	48.80	-5.17	-5.35	0.17	15.70	-0.23	-0.29	0.06	47.00
Mean	0.23	0.10	0.13	50.50	2.82	2.60	0.22	60.60	0.32	0.21	0.11	51.50

Table III
Regressions

"Diff $_t$" is the difference between the mean and median simulated portfolio return in a given year assuming equal-weighted probabilities and equal-weighted portfolios of 35 stocks. Outlier years 1974 and 1992 are excluded. T-statistics are in parentheses. The first three independent variables all represent cross-sectional characteristics (standard deviation, skewness and kurtosis) of the annual returns for the component stocks in the S&P 500 each year. The fourth independent variable is an OLS estimate of the marginal return for moving one decile in the direction of smaller firms in each year.

$$\text{Diff}_t = \alpha + b_1\sigma + b_2\,\text{Skewness} + b_3\,\text{Kurtosis} + b_4\,\text{Size Premium}$$

	b_1	b_2	b_3	b_4	R^2
(1)	.0135				.360
	4.30				
(2)		.1670			.577
		6.57			
(3)	.0068	.133			.638
	2.46	4.20			
(4)	.0079	.1988	-.0112	-.0117	.634
	2.73	3.14	-.92	-1.05	

Table IV
Regressions

Simulated median portfolio excess return (Panel A) is the difference between the median portfolio simulated using equal-weighted probabilities and equal-weighted investments of 35 stocks and the S&P 500 "index". Actual managers' median excess return to the "index" are explained in Panel B. Outlier years 1974 and 1992 are excluded. T-statistics are in parentheses.

Panel A:

Simulated Median Tracking Error $_t = \alpha + b_1 \sigma + b_2$ Skewness $+ b_3$ Kurtosis $+ b_4$ Size Premium

b_1	b_2	b_3	b_4	R^2
0.05	-1.67	.31	3.02	.917
(0.87)	(-1.21)	(1.19)	(12.62)	

Panel B:

Actual Managers' Median Tracking Error $_t = \alpha + b_1 \sigma + b_2$ Skewness $+ b_3$ Kurtosis $+ b_4$ Size Prem.

b_1	b_2	b_3	b_4	R^2
-0.38	-4.00	0.77	1.70	.556
(-3.22)	(-1.65)	(1.60)	(3.32)	

Table V
The Impact of Skewness on Simulation Portfolios by Number of Stocks

Each year between 1962 and 1995, 5,000 bootstrap portfolios are drawn from the S&P 500 for seven types of portfolios according to the number of securities drawn: 15, 25, 35, 50, 75, 100 or 150 stocks. The average spread over the years between mean and the median (in %) is reported below assuming either equal- or value-weighted probabilities for choosing stocks in the bootstrap procedure and assuming either equal- or value-weighted investment strategies once a given portfolio is formed.

Probability of Choosing a Stock	Portfolio Weighted Strategy	Number of stocks in each portfolio						
		15	25	35	50	75	100	150
Equal Weighted	Value Weighted (ev)	0.38	0.24	0.13	0.10	0.03	0.03	0.01
Equal Weighted	Equal Weighted (ee)	0.46	0.30	0.22	0.14	0.09	0.06	0.03
Value Weighted	Equal Weighted (ve)	0.22	0.13	0.11	0.09	0.05	0.04	0.02

Appendix A
Mean Annual Returns by Size Decile

At the beginning of each year, S&P 500 stocks are sorted into deciles on the basis of market cap. Reported below is the mean annual return to each decile. The size premium is an OLS estimate of the marginal return for moving one decile in the direction of smaller firms.

	Small firms								Large firms		Size
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Premium**
1962	-14.32	-9.17	-15.79	-14.17	-13.38	-9.95	-6.78	-10.49	-12.21	-10.15	-0.41
1963	30.73	34.06	26.18	17.29	23.92	20.35	22.15	18.76	18.78	21.97	1.28
1964	21.21	29.94	19.47	15.68	22.87	23.76	11.93	14.12	14.57	17.34	1.09
1965	37.62	35.55	28.03	27.54	29.98	21.48	25.33	22.55	9.41	13.16	2.70
1966	-13.26	-9.82	-11.87	-10.98	-13.16	-8.87	-4.58	-6.49	-9.85	-7.99	-0.59
1967	83.78	52.07	42.79	38.47	37.40	35.15	20.62	19.18	15.56	24.26	5.85
1968	47.18	33.35	38.68	20.85	27.66	23.13	22.24	18.06	14.46	3.44	3.81
1969	-34.02	-23.30	-24.50	-15.45	-15.89	-11.08	-13.70	-14.75	-10.84	-5.60	-2.44
1970	0.60	7.25	-1.25	-2.83	12.85	11.84	4.07	4.46	-1.37	4.89	-0.16
1971	18.60	12.28	20.74	22.26	21.22	18.07	15.88	11.45	12.59	16.72	0.51
1972	5.61	7.94	3.23	8.94	7.15	6.37	9.83	11.76	20.06	23.41	-1.75
1973	-26.36	-22.84	-12.55	-22.70	-23.10	-19.63	-15.38	-20.55	-8.37	-11.63	-1.33
1974	-5.13	-19.06	-23.82	-26.05	-20.32	-17.75	-24.48	-23.76	-24.76	-27.69	1.43
1975	62.88	65.93	60.56	79.13	63.95	51.37	51.72	34.34	37.06	31.42	4.31
1976	51.15	43.58	43.44	38.34	38.14	31.02	32.28	21.34	25.16	18.41	3.39
1977	12.68	4.92	5.38	1.54	-5.91	-5.10	-6.01	-4.10	-9.03	-11.78	2.35
1978	14.97	16.40	8.76	9.22	8.57	2.18	5.71	9.58	2.83	4.46	1.23
1979	52.81	35.28	26.74	33.55	30.90	32.73	25.95	22.79	12.81	21.52	2.91
1980	30.38	31.05	27.74	23.41	30.33	39.15	27.15	27.25	29.63	34.32	-0.26
1981	20.62	14.17	2.86	8.42	5.69	9.03	6.81	-2.02	-5.74	-9.77	2.66
1982	45.18	47.34	40.70	31.10	31.07	26.26	21.53	30.95	17.15	16.48	3.34
1983	48.31	47.61	34.03	28.54	28.54	21.22	15.13	31.71	22.04	19.02	3.04
1984	8.20	-5.00	-4.08	-0.97	2.51	3.82	9.31	9.02	-0.74	11.13	-0.93
1985	18.48	23.64	33.31	33.52	27.06	34.99	42.09	34.27	33.16	30.48	-1.29
1986	8.59	16.86	12.14	19.18	19.32	17.06	19.40	16.22	17.83	26.48	-1.13
1987	1.16	8.49	9.65	5.71	6.68	-2.33	6.69	2.93	2.44	6.11	0.23
1988	32.58	21.24	25.44	28.33	15.53	19.22	23.94	12.98	16.41	15.85	1.55
1989	21.89	25.42	22.80	23.77	28.22	24.56	27.24	30.64	31.77	39.24	-1.49
1990	-28.88	-15.48	-10.11	-13.40	-16.43	-10.15	-10.96	-2.17	-5.04	0.85	-2.39
1991	45.86	35.60	38.01	47.85	42.42	40.99	26.63	25.35	32.99	27.23	1.90
1992	18.33	23.08	17.08	14.72	26.14	13.55	13.66	11.02	6.31	5.33	1.70
1993	16.34	19.06	17.94	21.74	17.21	13.90	9.52	11.38	9.33	9.92	1.20
1994	3.42	-2.78	4.25	-0.41	1.60	2.07	-5.38	3.28	-3.13	3.61	0.12
1995	28.55	25.29	28.23	26.02	31.27	36.17	36.80	33.37	33.86	43.52	-1.56
Overall	19.58	17.94	15.71	15.24	15.59	14.55	13.13	11.89	10.15	11.94	0.91

Appendix B
Cross-Sectional Skewness of Annual Returns by Size Decile

At the beginning of each year, S&P 500 stocks are sorted into deciles on the basis of market cap. Reported below is the skewness of annual returns for firms in each decile. The skewness premium is an OLS estimate of the marginal change in skewness observed for moving one decile in the direction of smaller firms.

	Small Firms								Large Firms		Skewness
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Premium**
1962	0.03	0.41	0.51	0.05	0.11	0.20	0.96	-0.64	-0.14	0.21	0.03
1963	0.92	0.16	2.67	1.08	1.69	1.22	0.50	0.62	3.34	1.12	-0.07
1964	0.93	0.83	0.25	0.90	1.42	1.37	0.14	-0.18	0.01	0.85	0.07
1965	1.01	3.99	0.48	1.33	1.92	0.07	1.46	2.15	0.65	2.15	0.04
1966	0.83	2.67	1.07	1.13	-0.06	1.55	0.20	0.99	0.41	0.18	0.14
1967	1.20	1.77	0.84	0.95	0.33	3.85	2.24	1.78	1.73	0.85	-0.05
1968	0.99	0.62	0.67	0.45	0.73	1.16	0.82	0.27	1.85	0.06	0.00
1969	0.56	0.89	0.34	0.34	0.04	0.78	0.45	0.30	0.16	0.17	0.05
1970	1.27	0.35	0.01	-0.14	-0.02	-0.03	-0.73	-1.15	-0.05	-0.66	0.17
1971	0.39	0.39	1.79	0.60	0.84	0.41	2.01	0.53	0.12	0.31	0.03
1972	0.71	1.11	-0.13	0.92	0.07	0.52	0.20	0.69	0.90	0.39	0.01
1973	3.40	4.19	1.91	1.71	0.46	0.92	1.18	1.27	0.67	0.49	0.33
1974	5.52	1.64	0.40	0.58	0.68	0.55	0.63	0.19	0.26	0.14	0.36
1975	0.30	0.58	1.31	3.41	0.28	0.53	0.41	0.25	0.35	0.27	0.10
1976	1.47	0.73	1.28	0.29	-0.02	0.21	0.46	0.08	0.80	0.18	0.10
1977	1.47	0.98	1.03	0.84	0.14	-0.05	-0.13	-0.16	-0.36	-0.46	0.22
1978	0.82	1.14	0.24	0.70	1.02	0.35	2.35	3.28	0.25	0.05	-0.04
1979	1.89	1.28	1.20	2.28	2.43	0.96	1.26	1.74	0.47	0.74	0.11
1980	1.08	1.49	1.92	0.91	1.54	2.08	1.19	1.50	1.02	0.74	0.04
1981	0.47	-0.05	0.27	-0.34	-0.76	1.38	0.08	0.95	0.27	0.49	-0.06
1982	1.11	3.51	0.25	-0.05	0.36	-0.29	0.41	0.25	-0.45	0.72	0.19
1983	0.53	0.15	0.76	-0.57	1.08	0.16	-0.13	0.65	0.29	1.17	-0.04
1984	0.59	-0.53	0.48	-0.01	0.25	0.08	0.21	-0.09	0.06	1.50	-0.06
1985	0.71	0.35	0.71	0.20	-0.29	0.59	0.39	1.09	0.01	0.05	0.03
1986	1.00	0.30	-0.20	1.11	0.83	-0.56	0.37	0.04	0.31	0.21	0.06
1987	1.97	1.15	1.33	0.42	0.40	0.95	1.35	0.11	0.32	0.64	0.13
1988	2.17	2.02	1.38	1.72	0.90	1.98	1.59	-1.49	2.50	2.36	0.05
1989	0.16	0.75	0.30	0.86	0.01	-0.21	0.13	0.35	0.34	-0.82	0.08
1990	0.35	-0.32	0.69	-0.33	-0.54	-0.38	-0.25	0.13	-0.75	-0.53	0.08
1991	1.55	1.29	0.41	1.15	-0.35	1.40	0.30	1.10	0.04	1.08	0.06
1992	4.34	1.08	1.34	0.77	0.73	3.05	1.44	-0.08	0.43	0.24	0.27
1993	1.72	2.21	0.81	1.55	1.67	0.18	1.09	0.33	0.76	0.90	0.14
1994	1.24	0.38	1.26	1.34	0.83	2.39	0.12	0.64	0.27	-0.28	0.12
1995	0.90	0.46	0.54	-0.29	1.39	0.39	0.39	0.34	0.56	-0.12	0.05
Overall	1.28	1.12	0.83	0.76	0.59	0.82	0.68	0.52	0.51	0.45	0.00

Figure 1: Cross-sectional skewness versus the difference between the mean and median annual S&P stock return, 1962-1995. Each year, the 500 stocks in the S&P 500 index are identified. The difference between the mean and median of these 500 stock returns in a given year is then compared to the cross-sectional skewness observed that year. Note the significant outliers (in years 1974 and 1992).

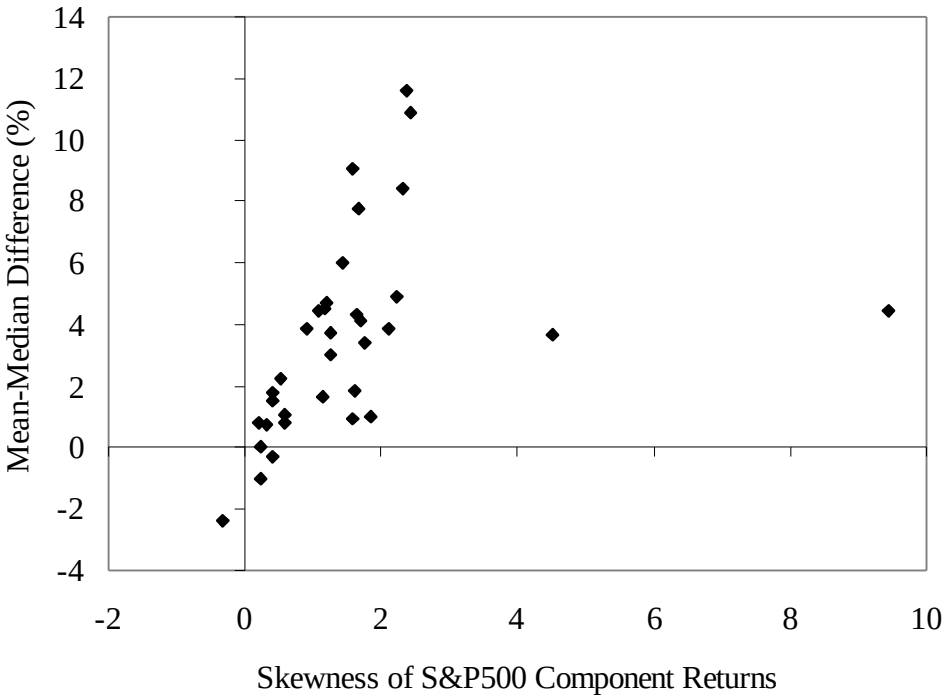
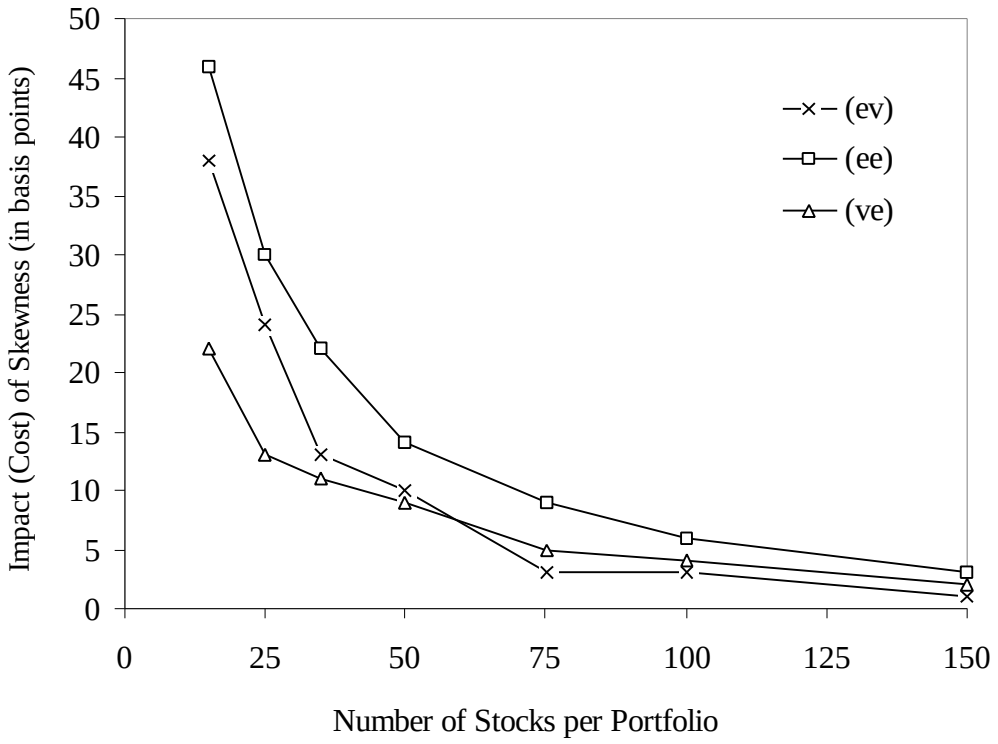


Figure 2: The "cost" of skewness and number of portfolio holdings. The "cost" of skewness or, the difference between actual benchmark S&P 500 return and median simulated portfolios, is shown for portfolios of various numbers of holdings as computed in Table 5. Skewness "cost" decreases as portfolio holdings increase.



Endnotes

[1] In recent years, substantial research has been conducted into how performance might be measured and evaluated. These papers include for example Chen and Knez (1996), Ferson and Warther (1996), Christopherson, Ferson and Glassman (1996) and Grinblatt and Titman (1993). These papers provide insight into factors that affect fund performance. In this study, we make general comparisons between fund managers and the S&P 500 and examine the impact of only two specific issues, both related to cross-sectional returns. Of course other factors likely exist as well. To the extent that managers in aggregate show particular loadings on factors mentioned in recent studies, our results might be further extended to illustrate the impact of these factors on median fund performance.

[2] Looking further back beyond only recent years, Malkiel (1995) observes that in aggregate, funds underperformed benchmark portfolios during the period 1971 to 1991.

[3] The literature provides numerous examples of cases where managers would appear to have access to valuable information. For example, Womack (1996) shows that sell-side security analysts regularly "predict" positive abnormal returns in their buy and sell recommendations. Moreover, a vast literature has emerged in recent years indicating abnormal long-run price performance for all kinds of corporate transactions. These include for example equity offerings (Loughran and Ritter (1995)), dividend initiations and omissions (Michaely, Womack and Thaler (1996)), share repurchases (Lakonishok and Vermaelen (1990) and Ikenberry Lakonishok and Vermaelen (1995)), stock splits (Desai and Jain (1997) and Ikenberry, Rankine and Stice (1996)) to name but a few. Taken collectively, this suggests that investors appear to have access to good information, but for whatever reason do not effectively capitalize on it.

[4] The "index" return reported here will deviate slightly from the actual index return reported by Standard & Poor's because of how we handle non-surviving firms.

[5] DeMarche Associates is a pension fund consulting firm based in Kansas City which evaluates fund managers of all investment styles.

[6] Note the impact of these two cases on kurtosis.

[7] Kurtosis measures the propensity for "fat-tails" or alternatively an abnormal likelihood for very high *or* very low returns. Given that annual returns are bounded below, extreme positive outliers grossly affect kurtosis. In Table I, it is easy to see that we have two such cases; one in 1974 and a second case in 1992. The earlier case is Great Western United with a total return of 676.4%. The latter case is Sun Company, which had a return of 212.0%.

[8] Because of our approach to handling firms that depart for whatever reason mid-year, the index return we report may differ slightly from the actual S&P 500 index return that year. If no firm were to depart the sample early, our index return would match the actual S&P 500 index return.

[9] The value weighted probabilities, equal weighted investment simulations had a correlation with median Core-fund manager returns of .03. The comparable correlation using the equal weighted

probabilities, value weighted investment approach was .01.

[10] The regression findings differ only slightly if these two years are included. Although only two firms in these two years had extreme returns, their impact spills over into the independent variables and distorts the more general picture.

[11] These regressions do not control for the overall market return. However, the effect of doing so would be minimal, as earlier we observed in Table I that skewness was not associated with rising or falling markets.

[12] The magnitude of the size-premium coefficient is rather substantial in these regressions. Recall that the size-premium is defined as the change in return due by decreasing the size composition of the portfolio by one decile group. On average, the size premium is about 100 basis points per year. Using the simulated data, the regression coefficient on size reported in Panel A suggests that our hypothetical managers benefited by roughly three decile ranks in direction of small stocks, or roughly 275 basis points per year (3.02 x .91). This is similar in scale to the impact of size we observed in Table II. Using actual manager data in Panel B, we see that median fund returns benefited from the impact of smaller stocks by a holding portfolios with a size exposure roughly 1.7 deciles smaller than the S&P index. Over this shorter time period, the size premium was approximately 1.0% per year. Thus actual fund mangers returns appear to have benefited from a size premium by roughly 170 basis points per year during this time period.