

THE SMALL-CAP-ALPHA MYTH

ORIGINS

Many say the market for the shares of smaller companies—so called small-cap and mid-cap stocks—offers greater opportunity for active management to add value than does the large-cap market. The underlying notion is that the market for small and medium caps is less efficient than the large-cap market, and, therefore, security mispricing is more prevalent there. It is true that fewer securities analysts follow small- and mid-cap companies, and they are less widely held by portfolio managers. But is there evidence that active management is really more productive in the small- and mid-cap arena than in the large-cap arena?

A survey of the literature turns up no compelling evidence that managers add value with greater consistency in portfolios dominated by smaller companies. As far as we can tell the active-small-cap thesis results from casual inspection of fund databases that sometimes show the majority of small-cap funds outperforming a popular index of smaller stocks over a particular timeframe.

Three performance-evaluation errors contribute to what we claim is actually the small-cap-alpha *myth*. The first is ignoring management fees. The second is using an inappropriate benchmark. The third is ignoring survivorship effects and other biases that inflate the average return of portfolios in commercial databases. Here is an illustration of the three at work.

VANISHING ALPHAS

We constructed a sample of 128 products from the Mobius Group M-Search database—a popular database of institutional commingled funds and composites of separate accounts—that represent themselves as active small-cap.¹ As is the case with most such databases, the vast majority (90%) of the products in the sample report only gross-of-fee returns. The median portfolio in this sample outperformed the Russell 2000 Index, before fees, by 4.04% per year over the ten years ending June 30, 2001.² Four percentage points per year for the median fund is a striking margin of value added.

Fees

Then we calculated fees for each product based on the managers' reported fee schedules and adjusted the returns accordingly.³ The median net-of-fee alpha was 3.09%, which is still a very respectable figure.

Benchmark Misspecification

The returns of small-cap portfolios are more heterogeneous than those of large-cap portfolios.⁴ Knowledgeable analysts would not compare all large-cap products with the S&P 500, recognizing the significant differences in style among managed portfolios. It makes less sense to compare small-cap portfolios to any single index owing to their even greater heterogeneity.

Sharpe [1992] describes a now-widely-used technique for combining multiple market indexes and sub-market indexes to create a unique benchmark for individual portfolios. Using a form of multiple regression, it splices several indexes together to establish the effective style mix (ESM) for each portfolio. The ESM is that combination of indexes having the highest R-squared relative to the subject portfolio, which means it is well-calibrated for the purpose of performance measurement.

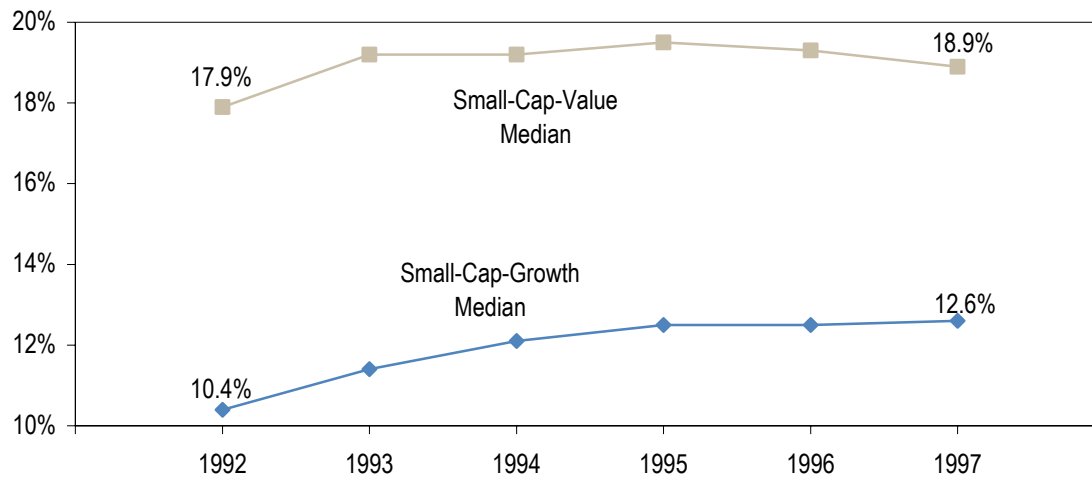
We developed ESMs for the products in the small-cap sample. The average ESM R-squared was 0.84 versus 0.71 for the Russell 2000, indicating that ESMs are the better benchmark. Relative to its ESM, the median portfolio in the sample posted an alpha of 1.20%. In other words, accounting for fees and using better-calibrated benchmarks reduced the median margin of value added by more than half—from 4.04% to 1.20%.

Survivorship and Related Biases

Commercial databases of portfolio returns suffer from survivorship bias, meaning they exclude the records of products that have gone out of business or ceased to report their results. Most of these databases also accept return histories after the fact—this is sometimes referred to as back-filling or “instant history” bias. (Obviously, managers do not introduce products with poor track records.) For these reasons you get a distorted picture of performance when you use these databases to gauge how well a class of managers has performed in the past.

Exhibit 1 (from Swensen [2000]) illustrates the point. In particular, it shows how the median fund return in a popular database evolved from the initial value reported in 1992. The 1992 median return of small-cap-value funds was originally reported as 17.9%. As funds were deleted and others were added after the fact, the median return rose to 18.9% by 1997. Likewise, the median small-cap-growth fund originally reported a return of 10.4% for 1992. That figure rose to 12.6% by 1997, as funds were deleted and added.⁵ Through the attrition of poor-performing funds and the after-the-fact addition of other funds, the 1992 median return of small-value funds increased by 1.0% and the median return of small-growth by 2.2%.

Exhibit 1
Levitating Fund Returns
Median Return of PIPER Funds for 1992,
As Reported in 1992 and Subsequently



Source: Swensen [2000]

But this is merely an illustration involving a single year. A number of rigorous studies have addressed the inflation of database returns caused by survivorship bias, generally arriving at a figure between 0.5% and 1.5% per year.⁶ Additionally, Carhart, et al. [2000] find that the incidence of fund mortality is greater for small-cap funds than funds in general.⁷ Inasmuch as there is a correlation between fund mortality and poor performance, we suspect that survivorship bias may be greater for small-cap portfolios than for large-cap portfolios.

The inflation of database returns arising from the addition of performance histories after the fact—back-filling or “instant history” bias—has received less attention from researchers, though its influence may be greater than that of survivorship bias. The only study of which we are aware that explicitly examines bias due to back-filling was done using a database of hedge funds, which, like Mobius, consists of self-reported returns of unregistered funds. Fung and Hsieh [2000] find a back-filling bias of 1.4% per year among hedge funds.⁸

These studies suggest return inflation of 2% a year or more in databases subject to survivorship and back-filling biases. From this we are left to conclude that the true median alpha for the fund sample described earlier is likely to be zero or negative, not 4%.

EVIDENCE

Relative Performance of Large and Small

For all the talk of greater opportunity to make money in small stocks, remarkably little rigorous empirical research has been done on the subject. Davis [2001], however, furnishes valuable insights.

Davis examines the performance of a large universe of stock portfolios free of survivorship and related biases.⁹ His database includes 4,686 funds covering 26,564 fund-years from 1962 to 1998. Returns are net. Alpha is derived using the Fama-French three-factor model to account for differences in investment style. The author evaluates the funds' performance a number of ways, one of which is sorting them by decile of capitalization, with Decile 1 representing the 10% of funds exhibiting the largest capitalization and Decile 10 the smallest 10% by capitalization. We believe this particular experiment provides a fair test of the active-small-cap proposition.

Exhibit 2 summarizes selected results from Davis.¹⁰ It reports the average monthly alpha by decile along with the associated *t*-statistic. None of the average intercepts is statistically significant, with the largest positive *t*-statistic being just 0.35. Based on these results we conclude that the average small- or mid-cap manager is not realizing abnormal gain.

Exhibit 2

Mean Monthly Alpha by Decile of Capitalization 1962 – 1998

Decile	Mean Alpha	<i>t</i> -Statistic
1 (largest)	-0.12	-1.69
2	-0.05	-1.52
3	-0.03	-0.79
4	-0.02	-0.67
5	-0.02	-0.65
6	0.01	0.20
7	-0.01	-0.25
8	0.01	0.15
9	0.02	0.35
10 (smallest)	-0.06	-0.76

Source: Davis [2001]

Persistence

In every period some funds post superior results. So while the *average* manager of small-cap funds underperforms its benchmark, exceptional managers may exist and achieve superior performance consistently. In an effort to detect the presence of superior managers, researchers test for *persistence* of performance among fund returns within a sample. If managers producing superior performance in one sub-period tend to repeat that performance in the subsequent sub-period, they are said to exhibit performance persistence. If the degree of

persistence is statistically significant, those managers are generally deemed to have sufficient skill to add value for their clients with a reasonable degree of consistency.

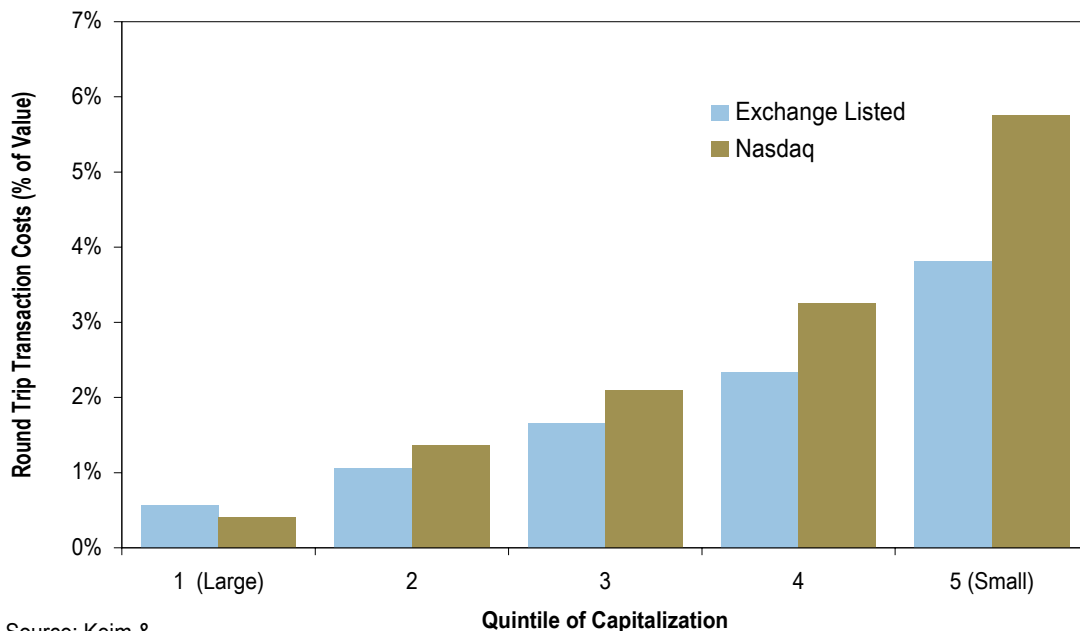
Carhart [1997], Davis [2001] and Kahn and Rudd [1995] examined fund returns adjusted for differences in style using different methodologies. None found statistically significant evidence of persistence. In addition to casting doubt on the existence of superior managers, these results show that past performance is not useful in manager selection.

INSIGHTS

Expenses

Investment management fees are higher and transaction costs are greater for small-cap portfolios. Typical management fees for large- and small-cap institutional portfolios are 50 and 80 basis points per year, respectively.¹¹ Transaction costs are much greater for small-cap stocks. Exhibit 3 illustrates how round-trip transaction costs, including commission and market impact, vary by capitalization.¹² For the largest quintile of stocks, round-trip transaction costs are approximately 0.50% of the value of the trades. By the middle quintile, cost increases to 1.66% to 2.10%, depending on trading venue. Round-trip trading in the smallest two quintiles costs 3-5% of the value of the trades, on average.

Exhibit 3
Round-Trip Transaction Costs by Capitalization



Source: Keim & Madhavan [1998]

We estimate typical management fees plus trading costs for institutional large-cap portfolios at approximately 0.9% per annum.¹³ We estimate a comparable, typical annual total cost for small-cap portfolios at more than 2.0% per year, or more than 100 basis points greater than for large-cap portfolios.¹⁴

Neglect

The idea that the market for small-cap stocks is less efficient may itself be faulty. Beard and Sias [1997] examined the performance of 7,117 stocks between 1982 and 1995. The authors sorted them by degree of *neglect* (defined as the number of security analysts following them) and by capitalization (size). They found that sorting on their measure of neglect alone, “neglected” firms did outperform widely followed firms. The authors then demonstrated that the return premium is actually a premium for small stocks during the period, and the small-stock premium correlated strongly with neglect. Or, in the words of the authors, “. . .we found no support for a neglected-firm effect after controlling for the correlation between neglect and capitalization.”¹⁵

An implication of this finding is that it may not be the degree of market inefficiency that distinguishes small-cap stocks from large-cap stocks so much as the cost of researching and trading them.

SUMMARY AND IMPLICATIONS

Empirical evidence provides no support for the claim that active management of small-cap portfolios is more fruitful than it is for large-cap portfolios. As a result of higher management fees and greater transaction costs, the typical overall cost *differential* between large- and small-cap portfolios is more than 100 basis points per year, in our estimation. Whatever the differential in market inefficiency between large and small might be, it is not sufficient to justify the greater cost of researching and actively trading smaller stocks by the average manager.

In every period some active small-cap portfolio managers achieve superior results, and we do not deny the existence of managers with sufficient skill to add value with reasonable consistency. We find no general evidence, however, that superior performance persists from one period to the next among small-cap managers. This means that small-cap portfolio managers’ past performance is not a reliable indicator of their future performance, which has important implications in manager selection.

One investment policy implication of these results is that passive management of small-cap stocks makes as much sense as it does for large-cap stocks. Another is that you can use a single index fund that matches your overall benchmark for the asset class, e.g., the Wilshire 5000 or Russell 3000 stock index, for all your passive management needs.

A final implication pertains to how one structures his active equity portfolio. Ennis [2001] shows that multiple-specialist portfolios have underperformed by the approximate margin of their cost. He proposes broadening the mandates of stock portfolio managers and allowing them to make valuation judgments along the spectrum of capitalization, as well as among growth and value sectors. It may be, therefore, the opportunity to add value through astute management of smaller stocks is knowing when to hold them and when to look elsewhere.

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ENDNOTES

¹ We screened the Mobius M-Search database for portfolios managed by firms with at least \$100 million in total assets under management, with at least ten years of gross-of-fee, total returns. We classified portfolios as small-capitalization domestic equity funds based on the characteristics reported by the individual firm. Portfolios included in the sample are those which the manager indicated that the asset class was domestic equity; that the description “passive” was “not applicable”; that the description “active” was “very accurate”, “somewhat accurate” or “applicable” to the product and that the description “small-capitalization” was “very accurate.” Portfolios with names that indicated that they were convertible, REIT or sector funds were deleted, as were portfolios with names that included the words “mid-cap” or “all-cap”, when the same firm offered a product labeled “small-cap.”

² We used median values rather than averages of value-added because of the skewed nature of the distributions of alphas—the extreme results of a few portfolios could have a material impact on the overall average. When such a skewed condition exists, the median is a more accurate measure of the results of a typical portfolio. The average-s corresponding to the median values of 4.04%, 3.09% and 1.20% cited in the text were 4.61%, 3.67% and 1.93%.

³ We used the manager’s reported fee for a \$50 million portfolio. The average fee was 0.82%.

⁴ We examined groups of all mutual funds classified by Morningstar as large-cap and small-cap. Over the ten-year period ending June 30, 2001, the large-cap group exhibited an average R-squared relative to the S&P 500 of 0.79; the small-cap group exhibited an average R-squared relative to the Russell 2000 of 0.71.

⁵ See Swensen [2000], pages 81 and 84. The underlying data source is Pensions and Investments’ Performance Evaluation Report (PIPER), Managed Accounts Report, 1992-1997.

⁶ See Grinblatt and Titman [1989], Brown, Goetzmann, Ibbotson and Ross [1992], Brown and Goetzmann [1995] and Malkiel [1995], Fung and Hsieh [1997], Carhart, et al. [2000], Fung and Hsieh [2000], for example.

⁷ See Carhart, et al. [2000], pg. 14. The authors find that, relative to non-surviving funds, survivors have less exposure to small-capitalization stocks.

⁸ Fung and Hsieh [2000] examined the TASS Investment Research database of hedge funds, which contained 1,120 surviving and 602 defunct funds, as of September 1999. TASS reports the actual “incubation” period for each fund (the period of time between the actual inception of the fund and its entry into the database.) The median incubation period was approximately 12 months; the authors obtained the 1.4% bias figure by dropping the first 12 months from each hedge fund’s performance record. Separately, the authors found the impact of survivorship bias in the TASS database to be 3% per year.

⁹ See Davis [2001], p. 22 (Three-Factor Results for Deciles of Mutual Funds Formed from SMB Sorts, 1965-98.)

¹⁰ From Table 2, Panel B (p. 22).

¹¹ The average management fee for large-cap portfolios in the Mobius Group M-Search Database is 51 basis points (467 products). The average for 161 small-cap products is 79 basis points.

¹² These “round-trip” costs are computed as the average of “buys” and “sells,” by quintile.

¹³ Using an average turnover rate of 70% and round-trip trading costs of 0.50%, trading costs equal 0.35% of assets annually. The figure of 0.9% is the approximate sum of 51 basis points and 35 basis points, i.e., 86 basis points.

¹⁴ Based on a typical management fee of 80 basis points and trading costs of 140 basis points (70% annual turnover and round-trip trading costs of 2.0%).

¹⁵ Beard and Sias [1997], p. 22.