

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

ASSETS UNDER MANAGEMENT

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ABSTRACT

1. How much money can investment managers take in before the ability to add value fades away to market returns minus fees? In small-cap space, most investors have developed rules of thumb, like no portfolio should accept more than \$1.5 billion from clients. In large-cap space, when we ask new managers at what level they would close, the answer is often, “We’d love to have that problem,” as if there is no limit imposed by the investment markets. However, as assets under management grow, investment flexibility is limited and managers must make choices. The best money managers recognize the trade-offs and *manage* around the related costs and constraints, making it impossible to generalize about the level of assets under management at which outperformance can no longer be achieved.
2. The problem is centrally related to the liquidity of the securities in the manager’s asset class. Liquidity constraints manifest themselves in the forms of explicit transaction costs, market impact costs, and opportunity costs to the portfolio. Although it is constantly changing, we can observe liquidity expressed as daily volumes traded. Recent liquidity data suggest that for a hypothetical U.S. small-cap equity portfolio with \$1.5 billion in assets and 100 holdings, the manager would need ten days to trade an average position. For a large-cap portfolio with \$6 billion in assets and 30 holdings, the implication is ten days to trade.
3. As liquidity fluctuates and their investment businesses develop, successful managers learn to navigate the necessary trade-offs. They ensure that they have skilled traders and good communications between investment team members. They consider the core issues of how they want to invest, including what length time horizon they prefer, how much diversification or concentration to use, and the source and structure of outperformance across the portfolio. They consider why they are in this business, how they want to manage it, and whether closing is an option when they have become too successful. The best managers are honest with their clients about these decisions; they do what they say, they say what they do, and they explain why. They have skilled and professional marketing and client service staff who manage client expectations appropriately as things change, which they inevitably do.
4. An empirical examination of our Investment Manager Database confirmed that managers are completely aware of the liquidity versus performance versus business dilemmas. The vast majority of small- and large-cap managers have relatively small assets under management. As of June 30, 2005, roughly two-thirds of the 459 small-cap managers in our database had under \$1 billion in assets under management, while less than 15% managed more than \$2 billion. Similarly, of the 837 mid- to large-cap managers in our database, over 70% had under \$2 billion in assets under management, while less than 15% managed \$5 billion or more. For all our concern about these risks, the number of portfolios with significant concentration and very large assets is small.

5. Our empirical analysis also suggests that there is no statistically significant relationship between assets under management and manager outperformance. In fact, statistical tests indicated a high degree of confidence that assets under management and manager outperformance are not independent variables, making any regression analysis spurious. However, when looking at managers within discrete asset tranches, we did find some evidence of relative outperformance in smaller portfolios than in larger portfolios, on average, with the exception of small-cap value.

6. The bottom line, still, is that large assets make it imperative that the manager's investment decisions are right.

SUMMARY

Introduction

As we evaluate money managers and discuss their services with clients, the question of assets inevitably comes up. How much money can an investment manager take in before the ability to add value fades away to market returns minus the fees?

Our purpose here is to discuss the issue and test the standard assumptions in order to help clients answer this question for themselves. In small-cap space, most investors have developed rules of thumb, like no portfolio should accept more than \$1.5 billion from clients. Most institutional small-cap managers have accepted this limit because their clients request it. Yet other, exceptional managers continue to achieve their value-adding objectives seemingly without difficulty despite having \$6 billion or \$7 billion in assets. In large-cap space, when we ask new managers at what level they would close, the answer is often, “We’d love to have that problem,” as if there is no limit imposed by the investment markets. However, logic would suggest that similar problems exist in large cap as in small, even if the magnitudes are bigger.

As assets under management grow, investment flexibility is limited and managers must make choices. This paper discusses the theory behind the concern, our empirical queries into our investment manager database, the nature of liquidity, and the investment trade-offs managers can choose.

The Theory

Everyone says performance degrades when assets under management grow too big because transaction costs rise and the opportunity set shrinks. Managers become the market themselves and opportunities for relative outperformance are no longer available. These are theoretical truths.

Transaction costs can be broadly categorized into three types: explicit costs, market impact costs, and opportunity costs. They all vary with the liquidity of the securities chosen.

Explicit transaction costs are easy to see. They are the commissions, fees, and spreads that pay brokers, market makers, and investment exchanges for their services. U.S. large-cap equity managers speak in terms of paying one to four cents per share, while small-cap managers pay three to six cents per share. Explicit costs have come down significantly over the last decade. In the end, these costs are predictable and managers hire experienced traders who work hard to get the lowest costs for the best execution. Whether the manager handles assets of \$50 million or \$50 billion, at any level above retail the costs incurred are proportional to the number of shares bought and sold. More meaningful cost differentials are incurred depending on the asset class being traded. While costs in the emerging markets could be many times higher, even in the ultra-liquid U.S. equity markets a few basis points of return are taken right off the top. Our 2003 report *Transition Management* explores this subject more fully.

Market impact is the amount that the price of a security changes due to the attempt to trade it. As in any system where prices fluctuate based on demand and supply, when an investor tries to buy (or sell) any

number of shares, other investors will try to increase their own profits by requiring a higher price to sell the same shares (or a lower price to buy). How much the price changes depends on how badly each party wants to complete the trade. The investor who is perfectly happy to walk away is the one who profits, and the investor who wants to change his portfolio is the one who pays the market impact. Mathematically, market impact is the difference between the price achieved in the final trade and the price it would have been if all other trades had happened except this one.

Market impact costs are largest if the transaction must take place immediately. They are also larger if the number of shares traded represents a larger proportion of the stock's total trading volume on that day. If a manager wants to buy all of a stock's average daily trading volume, his attempt to trade will definitely affect the price. How much of a day's volume can a manager buy or sell before the stock price is impacted? Many managers speak in terms of limiting themselves to 5% or 10% of the trading volume, but we often hear 20% instead.

Managers can mitigate the market impact by trading over several days. But taking more time increases the **opportunity cost** incurred when the stock price changes between the time of the decision to trade and the execution. This is the cost lamented at cocktail parties by investors who wished they had bought Microsoft in 1985 but neglected to tell their brokers. On a smaller scale, stock prices change all the time in reaction to earnings announcements, company news, and rumors. The longer the manager waits to execute his investment decision, the higher the opportunity cost if the stock goes against him.

Since market impact and opportunity costs work in opposition, they are difficult to control in total. For example, suppose a manager wishes to purchase 10% of a stock's daily volume. In order to reduce the market impact, she decides to trade over three days. On the second day, after she has completed only part of the transaction, a positive news release causes the stock's price to double. While she was right about wanting to buy the stock, the move to reduce her own impact cost her money because she acted slowly.

While explicit transaction costs exist, it is this heavy combination of market impact and opportunity loss that leads to the assessment that managers with large assets cannot outperform because they are themselves the market. If the manager in this example holds few assets, she requires only her own confidence to reassure her before she trades and she can easily reverse a mistake the next day. But if her assets are so large that it takes weeks to complete an order, she cannot afford to be mistaken.

There is another kind of opportunity cost in addition to the one incurred by trading over time. More literally, it is the shrinkage in number of opportunities—the size of the investable universe—when there is more money to invest.

For example, a hypothetical manager runs \$1 billion in a portfolio of 50 stocks, roughly evenly weighted, and will not hold more than 5% of any single company. In our many conversations with managers, we find that the even-weighting tendency and the 5% rule are very common. With this amount of money under management each position is 2% of the whole, or \$20 million. Because of the 5% rule, the manager cannot consider companies with a market capitalization less than \$400 million. That would seem not to be a

problem; after all, there were 2,365 companies in the U.S. markets on July 29, 2005, that were \$400 million in capitalization or bigger. But if the manager has \$2 billion under management, the investable universe shrinks to 971 companies. And, if the manager has \$10 billion, the universe only numbers 293.

While in theory this logic is perfectly correct, in real life we do not see money managers complaining that the investable universe is too small. Small-cap managers bump up against the constraint first. But they do not have to run 50 stock portfolios. In fact, nearly 60% of small-cap managers run portfolios of more than 75 stocks, while only 21% run portfolios of 50 stocks or fewer. Also, no portfolio is exactly evenly weighted. Even in a portfolio that is generally evenly weighted around 2% positions, the top ten might be 2.5% or 3% each while the bottom 20 are 1% or 1.5%. We almost always see that the largest capitalization names occupy the top ten slots. There is no reason why a small-cap manager with \$3 billion in assets cannot hold \$500 million capitalization companies—she just cannot hold big positions of them.

It is a prime example of how, in real life, money managers *manage* around the opportunity set, liquidity, and cost constraints. Institutional clients tend to ask only that their investment managers fulfill whatever philosophy and process expectations the managers themselves set. So long as the manager says ahead of time what the client can expect, she has full reign to determine what the portfolio construction choices will be and to manage around the constraints as she sees fit.

The less scientific proof that everyone knows that performance degrades when assets get too large is that it is the judgment implied by all the professional investors who close their portfolios to new clients. While it is the ultimate concession on the part of money managers to forego further fee income, we would point out that closing is also the simplest and most effective way to protect the portfolio managers' ongoing businesses from the inevitable constraint of liquidity.

Liquidity

Liquidity is at the foundation of the assets versus performance question because it underlies the determination of costs and opportunities. The lack of active trading volume means that a large trade is likely to move the price. In the worst case, illiquidity leaves an investor holding shares he does not want (or not holding shares he does) because there are no counterparties at any price. Costs and opportunities have to be managed on an ongoing basis because liquidity is not a constant. More like the winds and clouds than the weather, liquidity is always changing.

To show this we downloaded the daily trading volumes on the New York Stock Exchange (NYSE) over the last five years (Exhibit 1). The median number of shares traded was 1.4 billion each day. About half of the time, the shares traded were within 130 million of the amount traded the prior day, indicating a change up to 10% of the daily volume *every day*. The other half of the time, volume changes were bigger. About 7% of the time, the change in volumes was above 400 million shares, about 30% different from the prior day. About once every four weeks the drop or increase in liquidity was over 500 million shares, which is a lot when the total volume is somewhere between 1 billion and 2 billion shares for the whole NYSE.

Liquidity also varies between stocks. To illustrate this we graphed the 15-day average daily volumes on the Dow Jones Wilshire 5000 stocks ended July 29, 2005. Exhibit 2 shows the volume in dollar terms and as a percentage of the stocks' outstanding shares, both arrayed by stock market capitalization on the x-axes. Exhibit 3 shows the close-up version of the same two graphs to highlight the fluctuations at the smaller-cap end of the market.

Keeping in mind that this is a point-in-time observation, Exhibits 2 and 3 confirm that large-cap stocks are more liquid than small caps. In dollar terms, the amount of available stock falls dramatically as the capitalization level declines.

In percentage terms, however, more significant proportions of the outstanding stock trade in small companies—these are the spikes in the graph that increase in frequency and in height at the lower capitalization levels. While there may be less dollar and share volume in small-cap stocks on any given day, there are huge opportunities to trade significant amounts of a company at just the right moment. When we talk with managers about the nuances of specializing in large- or small-cap investing, the small-cap firms often describe this trading phenomenon. They express it as the “higher volatility in small-cap trading.” For months there could be limited dollar and share volumes available in a stock, and then suddenly a rumor will flash through the market and the price takes off or gets trashed in a very short time. Across the whole universe of companies, four-fifths actively trade less than 1% of outstanding shares in a given day, but a small fraction of companies concentrated in the small-cap area may trade 5% to 40% suddenly.

This volatility is a reason why small-cap managers tend to hold more names in the portfolio than large-cap managers: the diversification represents risk management against quick price moves and mistakes, as well as a way to invest more total assets. The volatility also speaks to the return opportunities in small cap. When a large proportion of a stock trades suddenly, it is likely to come with a huge price change as the majority opinion finds equilibrium with the contrarian minority. We like to think that the savvy investors are making profits off the speculators at these moments. Those investors who can get this right can add a lot of value.

As a last observation about liquidity and opportunities, notice how few truly large-cap companies there are. While large-cap investors may enjoy more reliable liquidity, small-cap investors have many more stocks to choose from. Of the 3,576 stocks above \$100 million in capitalization, only 292 are larger than \$10 billion and only 741 are larger than \$3 billion.¹

Liquidity versus Assets Under Management

With a picture of liquidity in our mind's eye, we should now be able to define how many assets a portfolio can handle.

¹ Considering that we have 1,400 U.S. large- and mid-cap equity managers in our database, it is no wonder they usually sound like they are all investing in the same companies. We have 650 small-cap managers.

Formula: Max Assets = (Avg Daily Liquidity) x (Max % of Daily Volume Allowed Daily) x (# of Days Allowed to Complete Trade) x (# of Stocks in Portfolio)

For example, small-cap managers tend to purchase stocks with market capitalizations between \$500 million and \$2 billion. On July 29, 2005, the past 15-day average daily volume was \$9.8 million. In fact, the median liquidity was much lower at \$6.5 million, but we can be generous. To minimize market impact costs, our hypothetical manager decides he will not trade more than 10% of the average daily volume in one day: \$9.8 million available liquidity x 10% per day = \$0.98 million per day. However, he allows a whole week to achieve his positions. \$0.98 million per day x 5 days = \$4.9 million in one position. He has 100 stocks in his portfolio, so he can handle \$490 million in the whole portfolio without impacting the market or missing his investment opportunities.

For a truly large-cap manager, who requires that the company should be over \$10 billion in market capitalization, the average daily volume on July 29, 2005, was \$189 million, and the median was \$109.4 million. Imaging that he, too, limits trading to 10% of the day's volume but allows five days to achieve his positions, the position sizes can be \$94.5 million each. With a diversified portfolio of 75 names, he can handle \$7.09 billion in the portfolio.

Recognizing that available liquidity for small-cap stocks could be double or half of \$9.8 million on any given day, the common assumption that a small-cap manager can handle \$1.5 billion in assets under management implies that the firm takes five or ten days or longer to achieve their positions, is willing to trade 15% or 20% of the day's stock volume every day, and holds at least 75 stocks.

Even in large-cap space, where managers like to tell us that there is no limit to how many assets they can accept, the decision to run a concentrated portfolio of 15 or 30 stocks has trading implications when assets exceed \$1 billion.

What the Data Showed

When we first looked at our investment manager database, we hoped to see a dramatic cliff where suddenly performance fell apart when assets got too big. If it could not be so simple, then we hoped our empirical data would reveal a clear degradation in performance. What we saw was more complicated.

The scatter graphs shown in Exhibits 7 through 10 plot the assets under management at the end of December in the horizontal axis against the subsequent calendar year return in the vertical axis. Our data starts with product assets under management at December 31, 1997, and extends with product performance through 2004. In order to control for survivorship bias, we measured performance in discreet annual periods so that we could include in the earlier years any firms that failed to submit information in the later years. In order to limit new-addition bias (back-filling), we excluded any firms that signed up to submit information after the subject year had begun. All of the products are active portfolios. (Among index managers, having large assets is generally an advantage rather than a disadvantage.) We segregated large and small cap from

growth and value. Having used the relative return so that we can minimize the general market trends, we plot all six years on one graph.

All the capitalization/style categories show a clumping of observations at the small asset side of the graph. Although we initially calculated a regression (which proved to have no statistical significance and not even to slope negatively in all cases) the scatter plot led us to wonder whether the asset size really was independent from the performance variable. While we have been asking whether performance suffers as a consequence of large assets, the dearth of observations in the larger asset side of the graphs suggests the reverse as well: the development of assets depends on performance.

We ran a chi-squared test of independence, which counts the number of portfolios out- or underperforming in separate asset size tranches and tests for statistical significance in the distribution. In general, the test confirmed that assets and performance are not independent variables. We measured a 99.5% confidence level in large growth, a 95% confidence in small growth, a 90% confidence in large value, but no confidence in small value.

Since the variables are not independent, a regression analysis would be spurious. However, we measured the mean relative performance in the smaller and larger asset tranches and tested for significance in the difference. The result was relative outperformance in the smaller portfolios and underperformance in the larger portfolios, with 95% significance in all categories except small value. While we display the means for the smaller and larger asset tranches, we caution readers not to interpret significance in the return numbers. Without a meaningful regression analysis, we cannot say that a certain amount of performance advantage is lost by having a certain amount of assets under management.

What's up with small value, you ask? The anecdotal answer is that value managers are more conservative and risk averse than growth managers, and small value managers are even more sensitive than large value to liquidity concerns. In response, they close to new clients. While small value firms might do it faster, across our data, all the managers do it. That is why there are so few managers for us to measure at the largest asset levels. It is why our data is all skewed on the left side of the graphs. On the one hand, the interplay between asset development and performance is a chicken-egg relationship. On the other hand, asset development is not hard to control. Adding more marketing staff is easy, and so is closing to new business. Anticipating liquidity levels, managing opportunity costs against market impacts, and making correct investment selection and timing decisions are much harder.

We expected the majority of the largest asset portfolios to be run by quantitative firms that deliberately design their processes to invest in hundreds of securities with low research costs and low transaction costs. In fact, only a few quantitative firms are super-large and, more importantly, the list of largest managers fluctuated from year to year based on which underlying strategy was in vogue. This brings us to behavioral finance and chasing returns—topics for other papers. Exhibits 11 and 12 list the assets under management, along with holdings, for the largest managers in the years 1997-2004.

The important conclusion from our data is not any proof that performance degrades when too many assets need to be invested, but rather that managers are very aware of the issues and take steps to protect their future performance (and their livelihoods) as best they can.

In our hypothetical calculation of how much money managers should be able to handle, we implied that five days trading up to 10% of the daily volume might be a reasonable level of liquidity risk. Based on the liquidity we observed in early June 2005, we said that \$500 million and \$6.65 billion would be reasonable assets for small- and large-cap portfolios, respectively, of 100 and 70 stocks.

To test the theory, we gathered the asset levels and number of stocks held for the 837 mid- and large-cap managers and the 459 small-cap managers in our database at December 31, 2004.

Number of U.S. Equity ex Small-Cap Managers by Holdings

<u>Assets Under Mgmt</u>	<u>< 25</u> <u>Stocks</u>	<u>26-50</u> <u>Stocks</u>	<u>51-75</u> <u>Stocks</u>	<u>76-100</u> <u>Stocks</u>	<u>101-200</u> <u>Stocks</u>	<u>> 200</u> <u>Stocks</u>	<u># of</u> <u>Mgrs</u>	<u>% of</u> <u>Mgrs</u>
< \$100 mil	13	53	30	16	22	10	144	17.2
\$100 mil to \$500 mil	14	65	57	19	30	15	200	23.9
\$500 mil to \$2 bil	18	90	62	35	39	9	253	30.2
\$2 bil to \$5 bil	2	33	32	18	30	12	127	15.2
\$5 bil to \$10 bil	4	20	19	6	13	3	65	7.8
> \$10 bil	3	9	13	8	13	2	48	5.7
# of Mgrs	54	270	213	102	147	51	837	
% of Mgrs	6.5	32.3	25.4	12.2	17.6	6.1		

Number of U.S. Small-Cap Equity Managers by Holdings

<u>Assets Under Mgmt</u>	<u>25</u> <u>Stocks</u>	<u>26-50</u> <u>Stocks</u>	<u>51-75</u> <u>Stocks</u>	<u>76-100</u> <u>Stocks</u>	<u>101-200</u> <u>Stocks</u>	<u>200-300</u> <u>Stocks</u>	<u>> 300</u> <u>Stocks</u>	<u># of</u> <u>Mgrs</u>	<u>% of</u> <u>Mgrs</u>
< \$100 mil	5	19	19	19	15	4	2	83	18.1
\$100 mil to \$500 mil	8	23	40	23	28	14	5	141	30.7
\$500 mil to \$1 bil	1	16	15	16	23	2	7	80	17.4
\$1 bil to \$2 bil	1	15	18	25	22	3	5	89	19.4
> \$2 bil	1	7	8	10	24	7	9	66	14.4
# of Mgrs	16	80	100	93	112	30	28	459	
% of Mgrs	3.5	17.4	21.8	20.3	24.4	6.5	6.1		

While managers certainly do take liquidity risk, in general they design their investment processes and control their businesses with risk management in mind. For all our concern about these risks, the number of portfolios with significant concentration and very large assets is small. One-third of the mid- and large-cap universe holds 25 to 75 names with \$100 million to \$2 billion under management. The small-cap universe is more evenly distributed, while it also shows the firms' decisions to limit asset growth above \$2 billion. More of a surprise is the small number of extra-diversified portfolios in general and, in large-cap space, the very small number who actually manage the asset levels they theoretically can handle from a

liquidity perspective. Small cap shows the tilt toward a higher number of stocks along with a higher asset level than we expected to see. Perhaps the large-cap managers who say they can manage any amount of assets find that attracting that many clients and managing the resulting business is not as easy as it sounds.

The Trade-offs: Business Management and Business Choices

The solutions to manage liquidity risks are pretty simple. All these solutions involve costs and create ramifications.

- **Hiring more experienced and efficient traders** requires adequate firm resources and profitability to be able to compensate them fairly. Surely that is not a problem.
- **Holding more securities** requires a larger and/or faster group of research analysts and portfolio managers to handle the increased workload. Firms might in addition to, or instead of, rely more on computer systems to substitute for people. Either way, two new issues are created: internal communications become more complicated, while the common understanding of the shared investment process becomes more important. Communication is more complicated simply because there are more people, all of whom have to know what everyone does so that they can support each other appropriately and so that decisions can be made both efficiently and correctly. Computers can help by automating parts of the process, whether the firm creates only simple screens that are still reviewed and interpreted by people or writes complicated quantitative models that collect and analyze security research and offer investment decisions. Increasing the number of securities also suggests to clients that the manager is changing their style, not in terms of broad investment styles, but rather altering their investment process, philosophies, and risk profile described when clients and managers first established their relationship. The number of securities is a common and direct indication of the amount and kind of risk the manager is going to take with the clients' assets. When clients hire investment managers, they describe their risk and return objectives and then choose firms whose existing philosophies and processes suit those purposes best. Like any kind of matchmaking exercise, the selection of manager and client is based on pre-established expectations. If a manager unilaterally decides that she needs to hold 90 or 100 stocks instead of 50 or 60, not only will her clients notice, they will wonder whether the manager's philosophy and process still matches their own objectives. It is a legitimate question. In our third-party position, it is not our place to say that a manager should or should not increase the number of portfolio holdings. But as our clients' advocate, we would also feel strongly that such a decision deserves appropriate investigation.
- **Moving up the capitalization spectrum** suggests to clients that they are changing the fundamental nature of the product, putting the manager at risk of violating client expectations. In addition, this change requires having or developing value-adding skill in a new investment area. We see managers all the time who start new products in larger- or smaller-cap stocks. Some of these new products are very successful and others are less so. As with everything else, there are basic similarities that can be extended to the new area, like information sources or analytical methodologies, and there are

other basic differences that need to be learned, like liquidity patterns or market reactions to news. Investment managers generally are well-educated and completely capable of stretching their minds around a new topic. But success comes from a combination of solid experience and good business management, and it is not guaranteed.

- **Accepting more days to trade** should not be a problem for managers who already turn over the portfolio relatively slowly. Essentially, when there is a low ratio of trading time horizon to investment time horizon, any security price change that occurs during the trading period is not likely to erode performance. For example, if a manager's investment holding period is usually five years (equivalent to 20% portfolio turnover), even if it takes him three weeks to accumulate his desired position, the potential price change in three weeks is much less than the potential change over five years. The \$80 to \$100 stock price on Wal-Mart between February and April 1999 completely justifies purchasing anywhere between the February 1994 price of \$28 and the May 1994 price of \$24. On the other hand, if the investment horizon was a year or two, it mattered whether he bought Wal-Mart at \$25.25 on January 17, at \$26.50 on January 31, or at \$27.25 on February 14 because the price dipped after May 1994 and traded between \$20 and \$28 until May 1997. When the potential price change in the trading period is a large proportion of the potential change in the holding period, the manager needs to expect a high return on the investment and needs to be correct in that expectation in order to justify the market impact and/or opportunity costs of accumulating the position.

When we think about the time to trade in this way it makes sense that institutional clients should prefer managers who originally designed their processes for longer investment horizons with slower turnovers. Especially large funds might require longer trading periods for their own accounts, let alone their managers' other clients.

Even if the manager has a low trading-to-investment-horizon ratio, there is still a basic risk that the price and the prospects for the stock might change radically during the trading period. Intraday price volatility is higher than one might expect: about 40 basis points (bps) on the NYSE and 1.0% on the Nasdaq.² As a single standard deviation statistic, however, that number does not describe the extreme situations nor their frequency. Looking at the most active issues and price percentage gainers and losers in *The Wall Street Journal* every day leads to some unscientific but interesting observations. Daily price changes between 5% and 20%, up or down, happen almost daily. These extreme gainers and losers are usually unrecognizable small-cap names, but they often include companies you have heard of and sometimes mid- or large-cap stocks. Among the most active issues, daily price changes in either direction of 50 bps to 1% are common.

If the manager has to take more time to trade because his positions are an increasingly noticeable portion of the stocks' liquidity, the basic risk in daily price changes is heightened. Maybe it is actually good if it was Tyco he was attempting to buy in January 2002: that first freefall in the stock's price actually took five weeks, dropping from \$57.25 on January 2 to \$23.10 on February 5. If our manager only traded one-tenth of his position before he saw the writing on the wall and changed his mind, the forced slowness would

² "Intraday Volatility on the NYSE and Nasdaq," by Daniel G. Weaver, August 9, 2002, on www.nyse.com.

have benefited his clients. On the other hand, the surge in Genentech from \$40 in May 2003 to \$80 in late July 2003 happened in a 45% rise on May 19, a handful of 2% to 5% one-day increases during the week following, and 6% and 7% rises on June 2 and June 4. Acquiring Genentech slowly over this period would have left a lot of money on the table. (Missing *both* Tyco and Genentech would add up and look bad.)

We expect that experienced professionals do not get taken in by this alarmist attention to daily price moves. Institutional clients care about long-term returns—and the managers who deliver those long returns are the ones who learn from their mistakes appropriately and move on. As a stylistic and procedural investment choice, there is nothing wrong with taking your time. But managers still need to be prepared and able to act swiftly because the basic risk of being unpleasantly surprised still exists. We will say again that when large amounts of assets are involved, mistakes are more expensive. Put the other way, it becomes imperative that the investment decisions are right.

Closing to New Assets

The fastest solution to the dilemma of growing assets is to close the portfolio to new assets. Of course, this too has its pros and cons.

On the positive side, closing makes the portfolio and the firm more exclusive (and there is nothing like exclusivity as a marketing draw). The firm can select its clientele and can charge higher fees. Some firms move to performance-based fees, which we support as a better way to align the manager's interests with their clients, so long as the fee is well-structured, and which both parties may find more profitable.

On the negative side, closing cuts the firm off from the revenues of a broader number of clients, and opens for question how the firm's investment staff themselves will continue to grow and feel personally satisfied.

The way to navigate these concerns, we feel, depends on the managers' objectives and motivations. Why do super-human investment professionals do this job for outside clients? If it is for the money, then closing is not the solution. On the contrary, closing means that the manager makes more money only if the portfolio actually performs—which is exactly why we like it. If it is for public acclaim and media attention, then it is okay to close so long as the existing assets are concentrated in retail mutual funds, which are followed by a large audience. If it is to be able to teach and mentor colleagues or to create a legacy, it may not matter whether assets get large because there will still be investments to study, and the new business management issues might be just as fun to share with the heirs. If it is to personally enjoy the continual learning about ever-changing companies, economies, and markets without having to spend as much time on firm administration, establishing procedures, marketing, and client service, then closing is a reasonable option. If it is for the pride that comes from making more profitable portfolio returns than a competitor, then closing definitely simplifies the business and liquidity problems associated with portfolio size. And of course, if the portfolio manager does this job because it is a way to help his existing clients safeguard and increase their resources, then closing is the best bet.

Conclusion

We have described these solutions as if they are separate dials on a machine, but they are actually interconnected. A better metaphor might be a stringed instrument, where correcting the pitch on one string changes the tension on the bridge and the tuning of all the other strings. Even if assets have grown, if available liquidity improves the new trader might prove so adept that the firm decides to lower the number of holdings and buy few lower-capitalization companies.

There is no absolute answer to the simple question of how much money is too much to manage. As liquidity fluctuates and their investment businesses develop, successful managers learn to navigate the necessary trade-offs. They ensure that they have skilled traders and good communications between investment team members. They consider the core issues of how they want to invest, including what length time horizon they prefer, how much diversification or concentration to use, and the source and structure of outperformance across the portfolio. They consider why they are in this business, how they want to manage it, and whether closing is an option when they have become too successful. The best managers are honest with their clients about these decisions; they do what they say, they say what they do and they explain why. They have skilled and professional marketing and client service staff who manage client expectations appropriately as things change, which they inevitably do.

The best managers of all have such investment skill that they are right often enough that it does not matter how much assets are under management.

NOTES ON THE DATA

NOTES ON THE DATA

Exhibits 4 through 7: Our data starts with product assets under management at December 31, 1997, and extends with product performance through 2004. In order to control for survivorship bias, we measured performance in discreet annual periods so that we could include in the earlier years any firms that failed to submit information in the later years. In order to limit new-addition bias (back-filling), we excluded any firms that signed up to submit information after the subject year had begun. All of the products are active portfolios. (Among index managers, having large assets is generally an advantage rather than a disadvantage.) We segregated large- and small-cap from growth and value. Having used the relative return so that we can minimize the general market trends, we plot all six years on one graph. We note the number of observations below.

Number of Observations Each Year

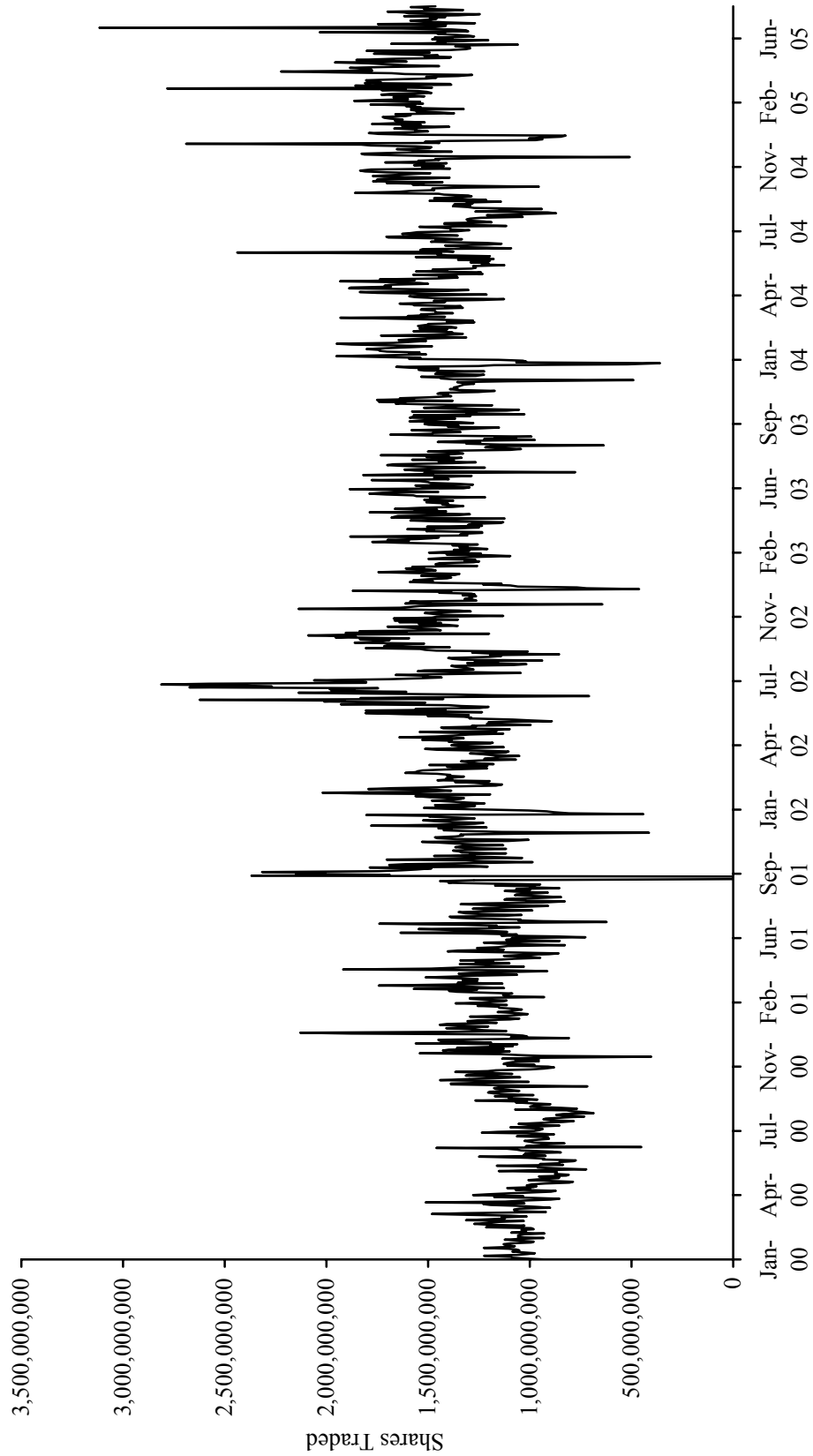
<u>Asset Class</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>Total</u>
Large Growth	245	261	304	323	355	349	352	2,189
Large Value	295	275	318	328	337	348	363	2,264
Small Growth	127	135	165	178	185	207	205	1,202
Small Value	104	116	116	158	177	194	203	1,068

EXHIBITS

Exhibit 1

NEW YORK STOCK EXCHANGE DAILY SHARE VOLUME

January 3, 2000 - July 29, 2005



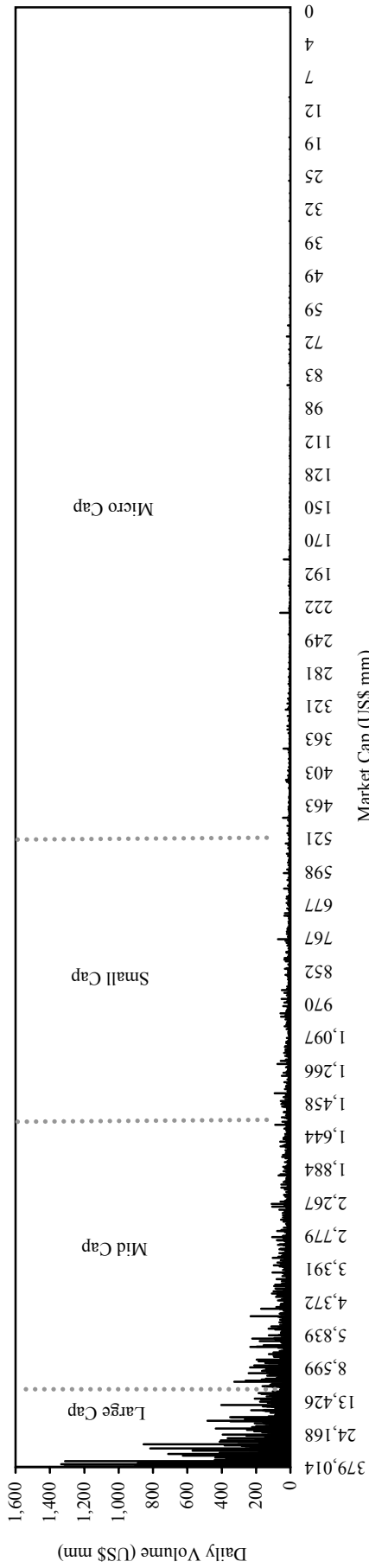
Source: New York Stock Exchange.

Exhibit 2

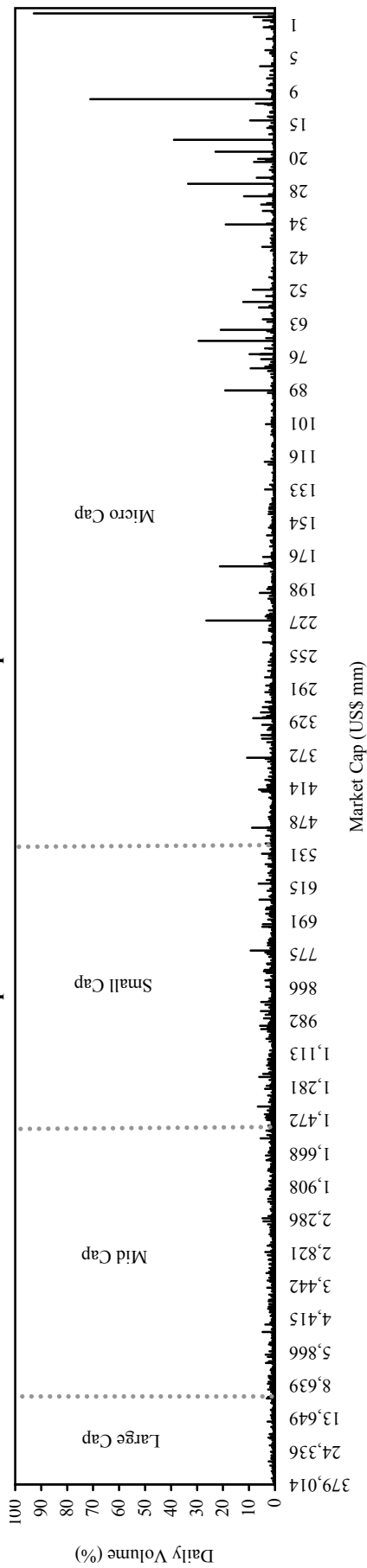
AVERAGE DAILY VOLUME OF DOW JONES WILSHIRE 5000 COMPANIES

Trailing 15-Day Average, July 29, 2005

Expressed as Dollar Volume Traded



Expressed as a Percent of Market Capitalization



Sources: Dow Jones & Company, Inc. and Wilshire Associates, Inc.

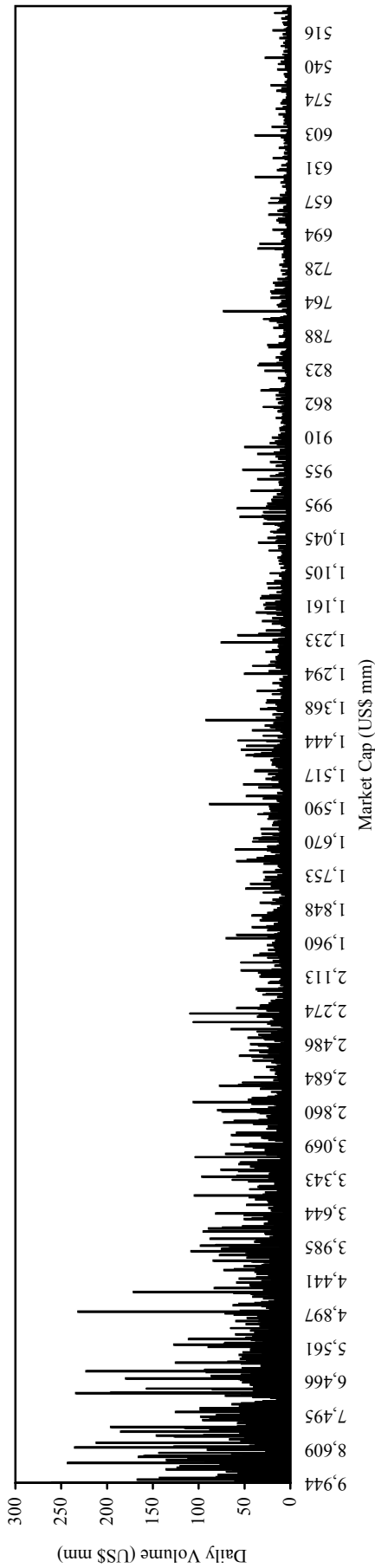
Note: Ranges for the breakdown are as follows: micro cap is up to US\$500 million, small cap is between US\$501 million and US\$1,500 million, mid cap is between US\$1,500 million and US\$10,000 million, and large cap is anything above US\$10,000 million.

Exhibit 3

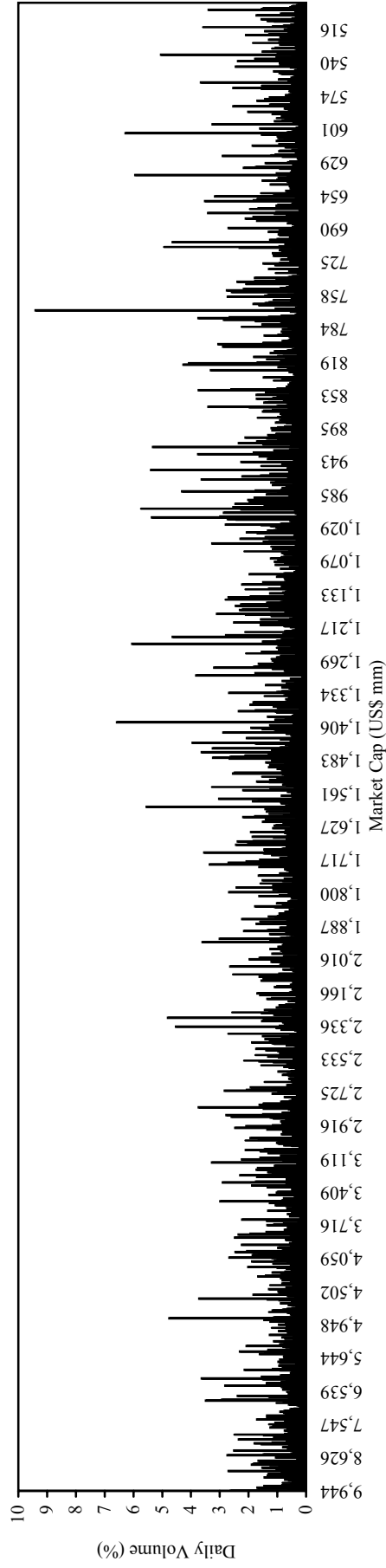
CLOSE UP OF AVERAGE DAILY VOLUME OF SMALL- TO MID-CAP DOW JONES WILSHIRE 5000 COMPANIES

Trailing 15-Day Average, July 29, 2005

Expressed as Dollar Volume Traded



Expressed as a Percent of Market Capitalization



Sources: Dow Jones & Company, Inc. and Wilshire Associates, Inc.

Note: Companies with market caps between US\$501 million and US\$10,000 million were used to graph the close-up.

Exhibit 4

LIQUIDITY STATISTICS BY CAPITALIZATION SIZE

During 15-Day Average, July 29, 2005

Number of stocks with market cap of \$16 billion and above = 181
 Number of stocks with market cap of \$1 million and above = 4,925

<u>Range</u>	<u>Number</u>	<u>Avg Daily Volume in \$</u>					<u>Standard Deviation</u>
		<u>Average</u>	<u>Median</u>	<u>High</u>	<u>Low</u>		
Between \$100m and \$499m	1,401	\$1,867,559	\$861,840	\$59,657,664	\$5,110	\$3,529,309	
Between \$500m and \$2b market cap	1,205	\$9,769,281	\$6,451,500	\$91,776,845	\$161,000	\$10,572,959	
Above \$3b	742	\$101,972,530	\$52,371,547	\$3,126,253,416	\$633,435	\$182,476,423	
Above \$10b	293	\$188,988,564	\$109,408,075	\$3,126,253,416	\$8,425,296	\$263,280,670	
Market cap of \$1,409m and above	1,259	\$67,316,285	\$28,391,169	\$3,126,253,416	\$296,763	\$146,412,585	

Sources: Dow Jones & Company, Inc. and Wilshire Associates, Inc.

Exhibit 5

**THE IMPACT OF PORTFOLIO CONSTRUCTION
AND ASSETS UNDER MANAGEMENT**

As of July 29, 2005

Large Cap (above \$10 billion market cap) where avg daily liquidity is (in \$ millions)

188.99

		IF				
<u>Limit Trades to a Percent of Daily Volume</u>	<u>Days Allowed to Trade Over</u>	<u>Number of Stocks in Portfolio</u>				
		100	75	50	30	
5%	10	9,449	7,087	4,725	2,835	
	5	4,725	3,544	2,362	1,417	
	3	2,835	2,126	1,417	850	
	2	1,890	1,417	945	567	
	1	945	709	472	283	
10%	10	18,899	14,174	9,449	5,670	
	5	9,449	7,087	4,725	2,835	
	3	5,670	4,252	2,835	1,701	
	2	3,780	2,835	1,890	1,134	
	1	1,890	1,417	945	567	
15%	10	28,348	21,261	14,174	8,504	
	5	14,174	10,631	7,087	4,252	
	3	8,504	6,378	4,252	2,551	
	2	5,670	4,252	2,835	1,701	
	1	2,835	2,126	1,417	850	
20%	10	37,798	28,348	18,899	11,339	
	5	18,899	14,174	9,449	5,670	
	3	11,339	8,504	5,670	3,402	
	2	7,560	5,670	3,780	2,268	
	1	3,780	2,835	1,890	1,134	

Sources: Dow Jones & Company, Inc. and Wilshire Associates, Inc.

Exhibit 6

**THE IMPACT OF PORTFOLIO CONSTRUCTION
AND ASSETS UNDER MANAGEMENT**

As of July 29, 2005

Small Cap (\$500m to \$2b market cap) where avg daily liquidity is (in millions \$)

9.77

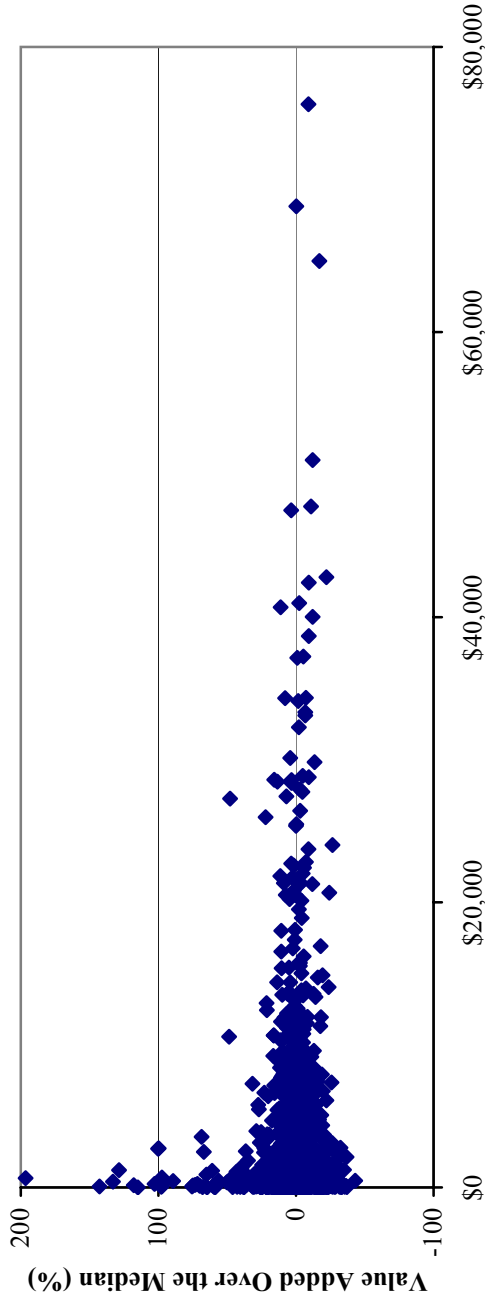
Limit Trades to a Percent of <u>Daily Volume</u>	Days Allowed to <u>Trade Over</u>	IF			
		Number of Stocks in Portfolio			
		100	75	50	30
5%	10	488	366	244	147
	5	244	183	122	73
	3	147	110	73	44
	2	98	73	49	29
	1	49	37	24	15
10%	10	977	733	488	293
	5	488	366	244	147
	3	293	220	147	88
	2	195	147	98	59
	1	98	73	49	29
15%	10	1,465	1,099	733	440
	5	733	550	366	220
	3	440	330	220	132
	2	293	220	147	88
	1	147	110	73	44
20%	10	1,954	1,465	977	586
	5	977	733	488	293
	3	586	440	293	176
	2	391	293	195	117
	1	195	147	98	59

Sources: Dow Jones & Company, Inc. and Wilshire Associates, Inc.

Exhibit 7

VALUE ADDED VERSUS ASSETS UNDER MANAGEMENT

U.S. Equity ex Small-Cap Growth Managers (1998-2004)



Assets Under Management (\$ Millions)

# < 0 Value Added	653	>\$1B	457	Total	1,110
# > 0 Value Added	720		355		1,075
# = 0 Value Added	4		0		4
Total	1,377		812		2,189
chi^2	2.93		4.97		7.91
Mean	2.33		-0.11		
Std Dev	16.58		13.21		
Holdings (#)	1,377		812		
Z Score					-3.79

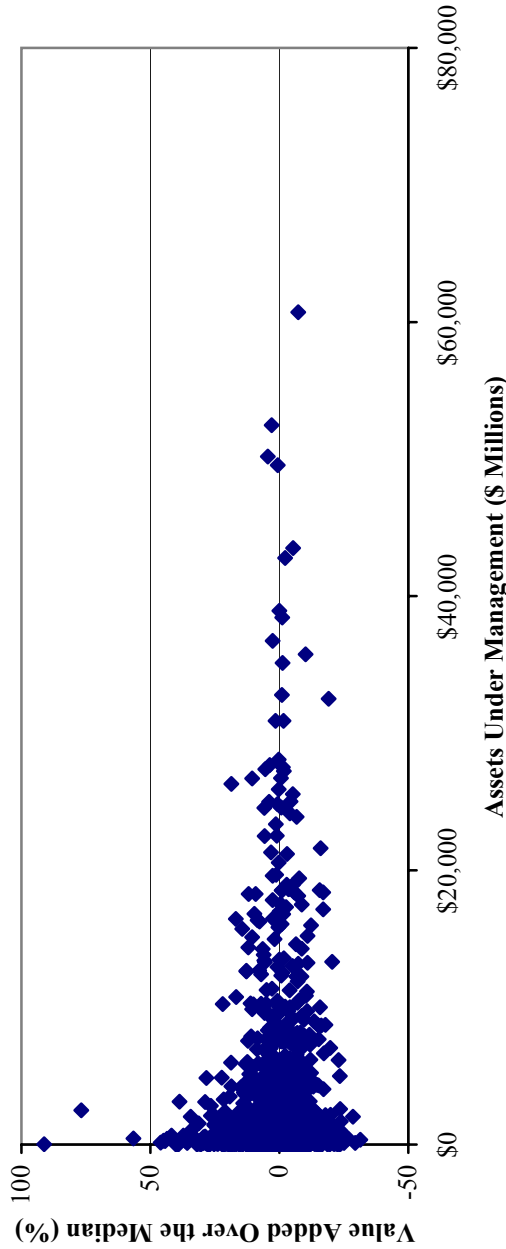
Source: Cambridge Associates LLC Investment Manager Database.

Note: Value added is measured relative to Cambridge Associates LLC U.S. Equity ex Small-Cap Growth Manager Universe.

Exhibit 8

VALUE ADDED VERSUS ASSETS UNDER MANAGEMENT

U.S. Equity ex Small-Cap Value Managers (1998-2004)



# < 0 Value Added	677	> \$1B	494	Total	1,171
# > 0 Value Added	691		399		1,090
# = 0 Value Added	2		1		3
Total	1,370		894		2,264
chi^2	1.41		2.16		3.6
Mean	1.06		-0.29		
Std Dev	10.3		8.9		
Z Score					-3.31

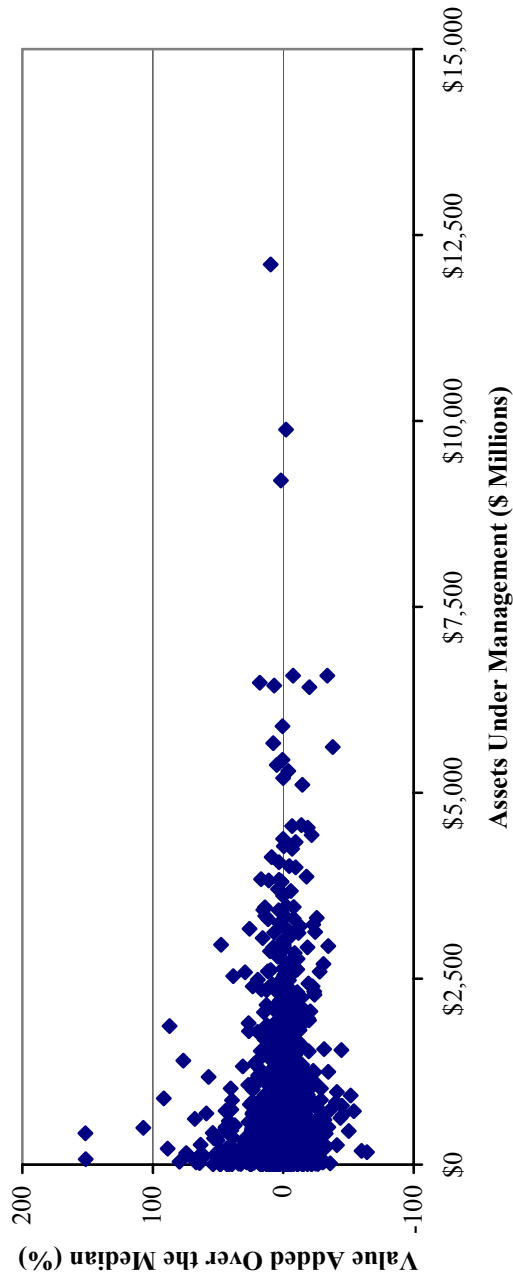
Source: Cambridge Associates LLC Investment Manager Database.

Note: Value added is measured relative to Cambridge Associates LLC U.S. Equity ex Small-Cap Value Manager Universe.

Exhibit 9

VALUE ADDED VERSUS ASSETS UNDER MANAGEMENT

U.S. Small-Cap Growth Managers (1998-2004)



	<u>≥\$500M</u>	<u><\$500M</u>	<u>Total</u>
# < 0 Value Added	305	306	611
# > 0 Value Added	239	349	588
# = 0 Value Added	3	0	3
Total	547	655	1,202
chi^2	2.61	2.18	4.79
Mean	-0.76	3.96	
Std Dev	15.99	19.78	
Z Score			-4.57

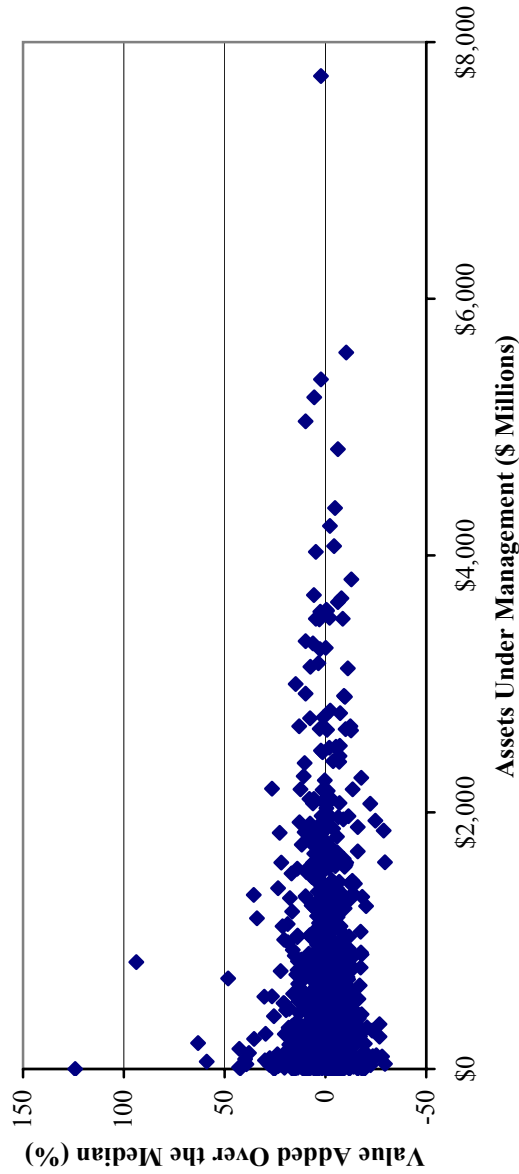
Source: Cambridge Associates LLC Investment Manager Database.

Note: Value added is measured relative to Cambridge Associates LLC Small-Cap Growth Manager Universe.

Exhibit 10

VALUE ADDED VERSUS ASSETS UNDER MANAGEMENT

U.S. Small-Cap Value Managers (1998-2004)



	>\$500M	<\$500M	Total
# < 0 Value Added	225	318	543
# > 0 Value Added	209	314	523
# = 0 Value Added	1	1	2
Total	435	633	1,068
chi^2	0.07	0.05	0.11
Mean	0.41	1.01	
Std Dev	10.08	12.00	
Z Score			-0.88

Source: Cambridge Associates LLC Investment Manager Database.

Note: Value added is measured relative to Cambridge Associates LLC Small-Cap Value Manager Universe.

Exhibit 11

PRODUCTS WITH THE LARGEST ASSETS UNDER MANAGEMENT IN THE U.S. EQUITY EX SMALL-CAP MANAGER UNIVERSE

(US\$ millions)

Firm Name	Product Name	As of December 31							
		1997	1998	1999	2000	2001	2002	2003	2004
AllianceBernstein	Alliance Disciplined Growth	\$14,381	\$21,305	\$28,772	\$26,424	\$34,348	\$18,893	\$15,730	\$8,621
	Holdings	NA	47	47	45	48	50	59	62
AllianceBernstein	Alliance Large Cap Growth	\$25,974	\$47,498	\$75,993	\$68,828	\$57,731	\$37,242	\$40,989	\$34,820
	Holdings	50	NA	53	53	49	53	59	57
AllianceBernstein	Bernstein U.S. Strategic Value	NA	\$23,902	\$32,800	\$26,706	\$26,721	\$22,534	\$27,523	\$30,129
	Holdings	57	60	50	NA	63	66	66	62
Barclays Global Investors	Alpha Tilts (S&P 500)	\$8,229	\$9,541	\$10,951	\$17,968	\$16,913	\$20,405	\$28,961	\$42,957
	Holdings	NA	292	239	359	329	281	205	217
BHM&S	Large-Cap Value (Fully Disc)	\$25,906	\$32,523	\$26,314	\$24,994	\$24,828	\$20,560	\$27,381	\$34,471
	Holdings	30	40	NA	40	45	45	45	NA
Davis Selected Advisers	Large-Cap Value	\$9,753	\$18,271	\$24,579	\$35,757	\$38,936	\$30,898	\$42,797	\$54,303
	Holdings	NA	NA	62	NA	68	63	57	53
Dodge & Cox	Common Stock	\$12,291	\$12,637	\$13,309	\$16,837	\$22,506	\$27,690	\$50,181	\$68,457
	Holdings	71	71	74	79	87	81	82	89
INVESCO	Large-Cap Value	\$24,566	\$24,158	\$18,562	\$13,018	\$8,045	\$1,026	\$758	\$321
	Holdings	59	69	NA	81	NA	NA	NA	70
Janus Capital Corporation	Aggressive Large Cap Growth	NA	NA	\$64,980	\$51,020	\$32,269	\$18,071	\$21,338	\$21,431
	Holdings	NA	NA	40	NA	46	53	47	44
Janus Capital Corporation	Diversified Growth	\$3,483	\$5,781	\$48,885	\$22,026	\$13,798	\$7,135	\$7,931	\$6,586
	Holdings	NA	NA	NA	42	56	71	54	50
Janus Capital Corporation	Janus Core Equity	\$20,814	\$28,458	\$48,885	\$46,189	\$32,189	\$19,739	\$3,467	\$3,535
	Holdings	NA	NA	NA	NA	NA	NA	90	77
Jennison Associates LLC	Large-Cap Growth	\$20,513	\$28,600	\$42,429	\$37,139	\$30,951	\$20,588	\$25,356	\$27,988
	Holdings	55	79	62	60	64	59	71	61
Legg Mason	Value Equity	\$653	\$10,255	\$18,396	\$18,127	\$18,570	\$15,737	\$27,234	\$37,304
	Holdings	NA	38	42	36	34	NA	35	36

Exhibit 11 (continued)

PRODUCTS WITH THE LARGEST ASSETS UNDER MANAGEMENT IN THE U.S. EQUITY EX SMALL-CAP MANAGER UNIVERSE

(US\$ millions)

Firm Name	Product Name	As of December 31							
		1997	1998	1999	2000	2001	2002	2003	2004
Lincoln Equity	Large Cap Growth	\$21,845	\$33,338	\$40,026	\$29,836	\$5,555	\$2,075	\$1,455	NA
	Holdings	61	75	60	60	60	58	57	NA
Lord, Abbett & Company	Large-Cap Value	\$12,960	\$13,836	\$16,364	\$17,333	\$19,614	\$19,681	\$30,700	\$41,215
	Holdings	NA	57	67	92	82	84	84	NA
Montag & Caldwell	Large-Cap Growth	\$12,740	\$22,427	\$25,479	\$20,220	\$16,777	\$21,273	\$28,859	\$26,726
	Holdings	33	32	35	32	33	32	34	35
Oppenheimer Capital	Large Cap Value	\$36,740	\$35,133	\$28,080	\$18,636	\$15,999	\$7,913	\$7,662	\$5,964
	Holdings	NA	NA	44	51	51	NA	NA	45
Private Capital Management	Value Equity	\$2,163	\$2,490	\$5,032	\$5,966	\$10,275	\$11,278	\$21,309	\$31,919
	Holdings	NA	NA	129	55	NA	52	45	43
Putnam Investments	Core Growth Equity	\$11,184	\$22,577	\$38,665	\$33,113	\$21,747	\$5,197	\$3,340	\$1,311
	Holdings	79	74	93	91	97	98	87	87
Putnam Investments	Large Cap Value Equity	\$49,563	\$60,713	\$52,471	\$43,508	\$38,451	\$25,015	\$25,566	\$24,201
	Holdings	NA	105	128	99	99	111	101	102
Sarofim (Favez)	Common Stock	\$34,108	\$42,797	\$40,690	\$34,325	\$27,426	\$23,737	\$27,740	\$28,517
	Holdings	NA	59	NA	54	NA	48	50	52
T. Rowe Price	Large-Cap Value	\$17,017	\$18,657	\$17,832	\$15,850	\$16,479	\$16,085	\$23,374	\$31,758
	Holdings	NA	82	87	90	72	79	77	80
TIAA-CREF	Stock Account	\$99,549	\$116,370	\$135,733	\$119,647	\$99,162	\$75,551	\$99,624	NA
	Holdings	NA	NA	NA	NA	NA	NA	NA	NA
Wellington Management	U.S. Core Equity	\$11,623	\$20,106	\$28,380	\$30,131	\$29,588	\$21,327	\$27,934	\$24,139
	Holdings	63	64	71	74	70	72	71	NA

Source: Cambridge Associates LLC Investment Manager Database.

Note: Boldface type indicates product's assets under management ranked in the top ten for the year.

Exhibit 12

PRODUCTS WITH THE LARGEST ASSETS UNDER MANAGEMENT IN THE U.S. EQUITY SMALL-CAP MANAGER UNIVERSE

(US\$ millions)

Firm Name	Product Name	As of December 31									
		1997	1998	1999	2000	2001	2002	2003	2004		
AllianceBernstein	Alliance Small Capitalization Growth Holdings	\$2,844	\$3,875	\$3,171	\$2,991	\$1,775	\$1,159	\$1,919	\$2,236		
American Express	Small Company Growth Equity - GSI Holdings	\$2,286	\$2,398	\$3,837	\$3,996	\$3,299	\$2,285	NA	\$2,319		
Ariel Capital Management	Ariel Small Cap Value Product Holdings	\$1,523	\$1,969	\$2,281	\$3,280	\$4,029	\$3,815	\$5,372	\$5,801		
Barclays Global Investors	Russell 2000 Alpha Tilts Holdings	\$2,305	\$1,898	\$2,130	\$2,274	\$2,478	\$3,989	\$7,517	\$8,097		
Baron Capital Management	Small-Cap Equity Holdings	\$4,280	\$6,418	\$1,573	\$1,525	\$1,782	\$1,953	\$3,049	\$4,947		
Brazos Capital Management, L.P.	Small-Capitalization Holdings	\$2,147	\$2,937	\$3,822	\$3,808	\$3,477	\$2,240	\$2,013	\$327		
Capital Guardian	U.S. Small-Cap - Institutional Holdings	\$2,903	\$4,357	\$6,722	\$6,417	\$6,591	\$4,882	\$6,341	\$3,561		
Columbia Wanger Asset Management	Wanger Extended Small-Mid Cap Holdings	\$4,336	\$4,274	\$4,950	\$4,912	\$5,628	\$6,303	\$12,102	\$14,916		
Cramer Rosenthal McGlynn	Small/Mid-Cap Value Holdings	\$3,333	\$3,120	\$1,922	\$1,968	\$2,394	\$1,468	\$1,653	\$1,953		
Dimensional Fund	Small-Cap Value Trust Holdings	\$2,643	\$2,732	\$3,667	\$3,316	\$3,563	\$2,998	\$3,691	NA		
Franklin / FTI	Franklin Small/Mid Cap Growth Holdings	NA	NA	NA	\$13,131	\$10,120	\$6,603	\$9,277	\$9,266		
Franklin / FTI	Franklin Small-Cap Growth Holdings	\$3,678	\$5,223	\$11,741	\$1,945	\$2,718	\$2,562	\$4,388	\$4,563		
Franklin / FTI	Franklin Small-Cap Value Holdings	\$1,286	\$1,517	\$1,136	\$1,250	\$2,123	\$3,373	\$4,303	\$5,988		
Lazard Asset Management	U.S. Small Cap Equity Holdings	\$4,231	\$4,072	\$3,569	\$3,271	\$2,517	\$988	\$1,193	\$1,199		
Liberty Ridge Capital	LRC Small Cap Growth I Holdings	\$3,334	\$3,461	\$4,553	\$2,327	\$1,808	\$881	\$35	\$4		
	Holdings	81	111	100	NA	84	80	NA	91		

Exhibit 12 (continued)

PRODUCTS WITH THE LARGEST ASSETS UNDER MANAGEMENT IN THE U.S. EQUITY SMALL-CAP MANAGER UNIVERSE

(US\$ millions)

Firm Name	Product Name	As of December 31									
		1997	1998	1999	2000	2001	2002	2003	2004		
Lord, Abbett	Small-Cap Growth	\$547	\$1,554	\$4,246	\$3,342	\$2,907	\$1,731	\$1,770	\$1,475		
	Holdings	NA	81	NA	122	144	144	152	NA		
MFS Investment Management	MFS Small Cap Growth Equity	\$3,118	\$3,828	\$4,136	\$5,373	\$5,292	\$3,115	\$4,015	\$3,264		
	Holdings	NA	176	167	171	174	218	284	188		
Neuberger Berman	Small-Capitalization Value	\$3,516	\$3,503	\$2,671	\$3,578	\$5,045	\$5,583	\$7,735	\$10,151		
	Holdings	106	123	102	95	106	102	107	91		
NFJ Investment Group	Small-Capitalization Value	\$689	\$789	\$641	\$640	\$840	\$1,449	\$1,022	\$5,850		
	Holdings	NA	99	101	98	100	103	NA	97		
Nicholas-Applegate	U.S. Emerging Growth	\$3,420	\$2,958	\$5,106	\$2,766	\$2,389	\$1,413	\$1,477	\$782		
	Holdings	NA	95	115	93	118	96	99	159		
Perkins, Wolf, McDonnell	Small-Cap Value	\$163	\$476	\$1,334	\$2,681	\$4,364	\$3,835	\$4,829	\$4,829		
	Holdings	NA	NA	NA	NA	NA	NA	80	88		
Provident Investment Counsel	Small-Cap Growth	\$2,769	\$2,536	\$4,339	\$3,153	\$2,533	\$1,576	\$2,480	\$2,542		
	Holdings	NA	163	177	142	151	150	174	143		
RS Investments	Emerging Growth Composite	NA	\$778	\$4,533	\$4,564	\$3,207	\$1,757	\$2,316	\$1,816		
	Holdings	NA	116	272	164	191	183	184	NA		
T. Rowe Price	Small-Cap Core Strategy	\$826	\$1,399	\$2,184	\$3,659	\$4,850	\$4,946	\$7,337	\$9,050		
	Holdings	NA	208	229	246	254	243	268	289		
T. Rowe Price	Small-Cap Growth Strategy	\$5,444	\$5,617	\$6,440	\$6,478	\$5,893	\$3,706	\$5,668	\$6,671		
	Holdings	NA	61	68	75	79	75	77	89		
T. Rowe Price	Small-Cap Value I Strategy	\$2,502	\$2,174	\$1,770	\$1,560	\$2,925	\$3,637	\$5,232	\$7,562		
	Holdings	91	94	102	108	106	110	109	111		
TCW Group	TCW Small-Cap Growth	\$1,861	\$6,575	\$4,432	\$4,432	\$2,924	\$1,137	\$1,747	\$1,404		
	Holdings	130	104	106	88	96	96	110	99		
Vanguard Group	Vanguard Explorer Fund	NA	NA	NA	NA	NA	NA	NA	\$9,576		
	Holdings	NA	NA	NA	NA	NA	NA	NA	NA		

Source: Cambridge Associates LLC Investment Manager Database.

Note: Boldface type indicates product's assets under management ranked in the top ten for the year.