

## When do active equity managers add alpha?

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Originally published:

July 23, 2003

**Updated: March 2, 2004**

Equity investors have debated the merits of investing in passive versus active management for some time, with differing views on the extent to which stock, industry, or sector selection can improve returns after trading costs. Most focus is on whether active alpha management can add value through skill applied by the portfolio manager and investment process. **Factors in the dynamics of shifting market conditions may facilitate or impede the ability of a portfolio manager to generate alpha at different points in time.**

Since equity returns expectations have been falling, it is not surprising that active investing and absolute or total return strategies are again in the spotlight. In the late 1990s by contrast, when 15-20% returns for U.S. equity indexes were common, active managers were defending their turf against difficult odds. Today, after a three-year bear market, investors see a 1-5% alpha as significant compared to 7-9% equity return expectations and the potential for 15-20% equity volatility.

In this report, we reexamine the factors that drive the ability of active investing to beat benchmarks, using performance data from the Russell investment manager universe, updating previous work on this topic (See Related Reports, p.12). We also take stock of the performance of different groups of active managers in the U.S. market. We find that:

- **The importance of cash drag and a small cap bias to outperformance by active managers has diminished, but dispersion across stock returns, the strength of a value style factor and momentum contribute to the ability to outperform.** Differentiating investment strategies by style and size categories indicates that different types of market environmental factors drive the success of active investing for each category.
- **The historical track record for the median small-cap manager looks more attractive than that for the median large-cap manager, in the core as well as style segments of the U.S. market.** Small-cap excess performance seems to be less driven by systemic market-wide factors.

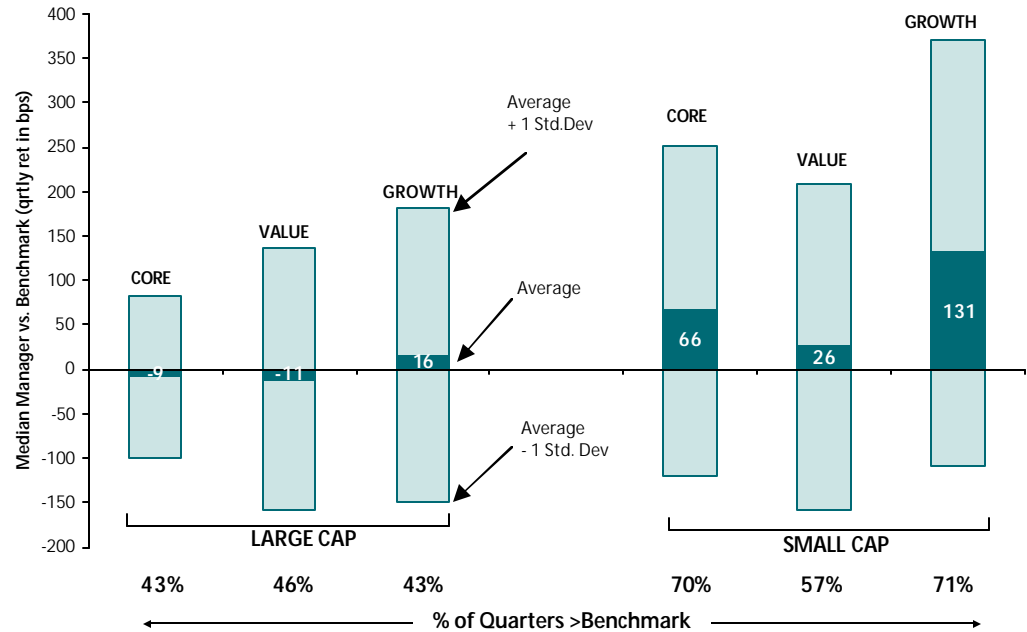
### Large-cap active managers have had a difficult time adding alpha; small-cap managers have fared better vs. benchmark

**In aggregate, active managers have had a difficult time outperforming the large-cap segment of the U.S. market (Exhibit 1).** The median large-cap core manager underperformed the Russell 1000 Core Index by 9 bps per quarter on average from 1990 through 2003. The median value manager fared worse than the median growth manager: he lost 11 bps per quarter on average compared to the Russell 1000 Value Index, while his growth counterpart added 16 bps per quarter on average to the Russell 1000 Growth Index.

Excess return of the median active manager relative to benchmarks has varied substantially from quarter-to-quarter. The standard deviation of these median excess performance numbers was about ten times as large as the average performance numbers themselves. Other evidence underscoring the mixed record of U.S. large-cap managers can be found by counting the number of periods when the median manager beat his

benchmark. The hit rates at the bottom of Exhibit 1 highlight that the median large-cap active manager (core as well as style) outperformed his benchmark in less than half of the quarters.

**Exhibit 1: The median large-cap manager has added less alpha than the median small-cap manager** (Quarterly data from 1990Q1 to 2003Q4)



Source: Russell/Mellon Analytical Services and Frank Russell & Co.

Median manager performance obviously provides only one snapshot of the universe of active managers.<sup>1</sup> While large-cap value managers in particular had reason to cheer in the early stages of the bear market (2000 and 2001), the last two years turned out to be more difficult years for large-cap managers across both core and style segments. In addition, the spread between the top and bottom quartile managers has recently narrowed, after widening during the period 1998 to 2001.

The picture looks distinctly more optimistic for small-cap active managers. The median Russell small-cap active manager outperformed his benchmark, in the core segment as well as in the style segments (Exhibit 1). As in the large-cap space, the median growth manager performed better than his value counterpart. He added 131 bps per quarter on average on top of the Russell 2000 Growth Index, while the median value manager added 26 bps on average on top of the Russell 2000 Value Index. Not only does the median small-cap manager seem to have added more alpha than the median large-cap manager, but he also seems to have been able to do it more consistently. Looking at hit rates, he outperformed his benchmark in about 60% or more of the quarters (bottom of Exhibit 1).

<sup>1</sup> In our Appendix, we provide a more refined view by adding the annual outperformance of the top and bottom quartile managers to the annual outperformance of the median manager, and by tracking active manager performance through time.

The evidence presented above might lead someone to jump to the conclusion that active management pays off more in the small-cap segment compared to the large-cap segment and in the growth segment compared to the value segment.<sup>2</sup> One should however keep in mind that excess returns provide only one side of the coin.

**As small-cap and growth managers typically run more concentrated portfolios than value managers, their relative outperformance is probably offset by an increased exposure to benchmark tracking risk.<sup>3</sup>** Also, there may have been a dominance of systemic factors in the market place that favored one type of manager over another.

While we based our findings on institutional manager data from Russell/Mellon Analytical Services, **other sources such as Standard & Poor's Indices Versus Active Funds Scorecard (SPIVA) report performance numbers generally consistent with our longer history.<sup>4</sup>**

Their findings for 2003 can be summarized as:

- More than 50% of large-cap and mid-cap active funds underperformed their benchmark.
- Small-cap funds performed better, with approximately 61% of managers beating the small-cap index.
- Growth managers, and especially small-cap growth managers, performed well.

### What market environments are more conducive to adding value through active management?

In our prior reports in 1996 and 1998, we examined the relationship of equity returns in excess of cash and the track record of active managers.<sup>5</sup> We found a negative relationship between equity excess returns and active performance. Exhibit 2, which plots the moving average of median large-cap core performance in the Russell universe since 1990, clearly illustrates this inverse relationship between the strength of the index and alpha of large-cap managers.

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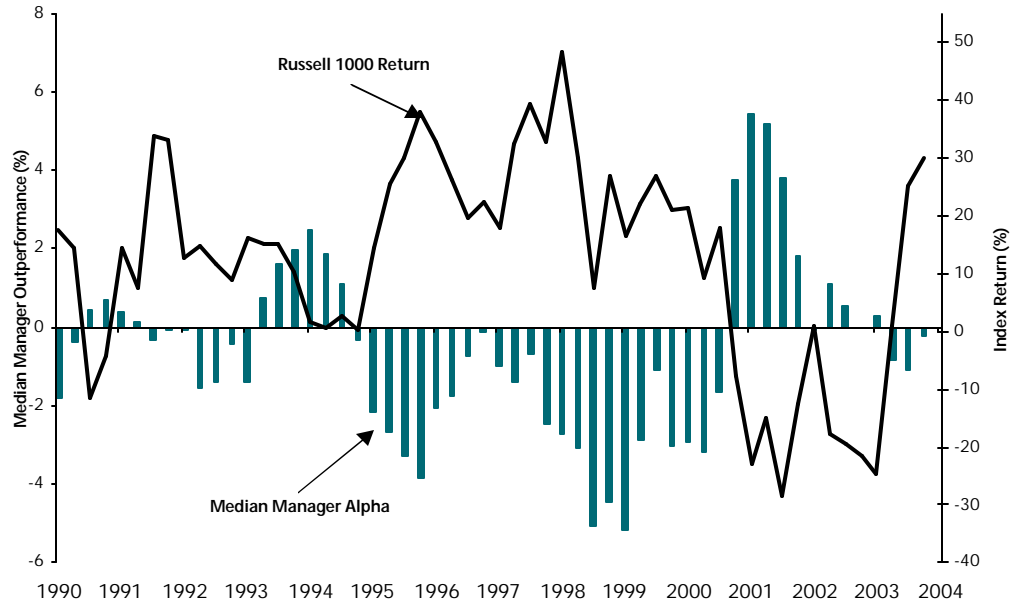
<sup>2</sup> Some portion of the small-cap excess performance can probably be attributed to benchmark differences between competing benchmarks used to measure small-cap alpha. The Appendix compares the alpha added by small-cap managers using different benchmarks. We find that a different choice of benchmark reduces the excess performance of small-cap managers, but their excess returns still look more attractive than the excess returns generated by their large-cap peers.

<sup>3</sup> See "How much 'error' in tracking error? The link with changes in stock volatility and cross-stock dispersion" by Ingrid Tierens and Alfke Kierspel, July 25, 2003, for an analysis of how tracking error itself changes with changing market circumstances.

<sup>4</sup> See "Standard & Poor's Indices Versus Active Funds Scorecard, Year-end 2003", Standard & Poor's, January 14, 2004. SPIVA's universe consists of the domestic U.S. equity funds in Standard & Poor's Mutual Fund database, which classifies funds in nine different size/style boxes instead of six (adding mid-cap blend, growth and value), and analyzes returns net of fees. Not surprisingly, SPIVA uses the S&P indexes instead of the Russell indexes as the relevant benchmarks.

<sup>5</sup> A listing of prior research reports on related topics can be found at the end of this report.

**Exhibit 2: Alpha of large-cap managers improved when market returns were negative**

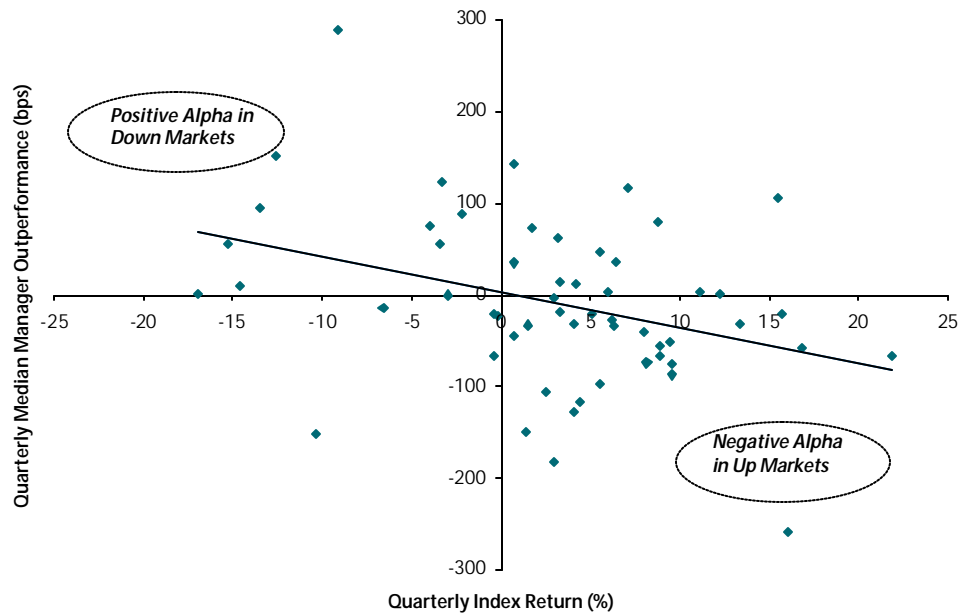


NOTE: Returns are 12-month trailing.

Source: Russell/Mellon Analytical Services and Frank Russell & Co.

Exhibit 3 shows the link with market direction more directly by plotting quarterly excess performance for the median large-cap core manager against the quarterly return of the Russell 1000 index from 1990Q1 to 2003Q4. Down markets coincided with predominantly positive excess returns, while the most severe negative excess returns occurred in up markets. The correlation between the alphas and index returns in excess of cash over the entire 1990Q1-2003Q4 period was  $-0.36$  ( $-0.27$  in 1990Q1-1996Q4 and  $-0.40$  in 1997Q1-2003Q4).

**Exhibit 3: The alpha of large-cap core managers appears negatively related to the strength of the market** (Quarterly data from 1990Q1 to 2003Q4)



Source: Russell/Mellon Analytical Services and Frank Russell & Co.

While market direction looks like a potential candidate to explain excess returns, this section investigates a variety of factors that may play a role in how well active managers perform. These factors include:

1. Cash drag / market direction
2. Small-cap tilt
3. Style dominance
4. Cross-stock correlation / stock dispersion
5. Momentum

We define each of the factors below and discuss their expected impact:

### Expected Impact

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1. **Cash drag / market direction.** Active managers typically hold around 5% of their assets in cash to accommodate cash inflows and outflows. In an up (down) market, this cash drag will have a negative (positive) impact on portfolio performance. We measure cash drag by the difference between the quarterly total return on the S&P 500 index and the quarterly total return on Treasury bills, and expect the relation between active manager outperformance and this cash drag proxy to be negative. Cash drag is obviously connected to market direction.

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2. **Small-cap tilt.** Active managers often times take proportionately larger active bets in smaller companies, more equal-weighted bets and less cap-weighted bets, or hold portfolios that are underweight the largest companies in the index. The resulting small-cap tilt in their portfolios will, therefore, pay off in small-cap driven markets and hurt them in large-cap driven markets. We measure the small-cap tilt by the difference between the quarterly total return on the Russell 2000 Core index and the quarterly total return on the S&P 500 index.

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3. **Style dominance.** Investors usually identify a “stock picker’s market” with a bottom-up, value-driven environment. We test this conjecture by using the difference between the total return on the Russell value and growth indexes (either for large-cap or small-cap, depending on the choice of active manager universe) as a proxy for value style dominance, and expect the relation between active manager outperformance and this proxy to be positive.

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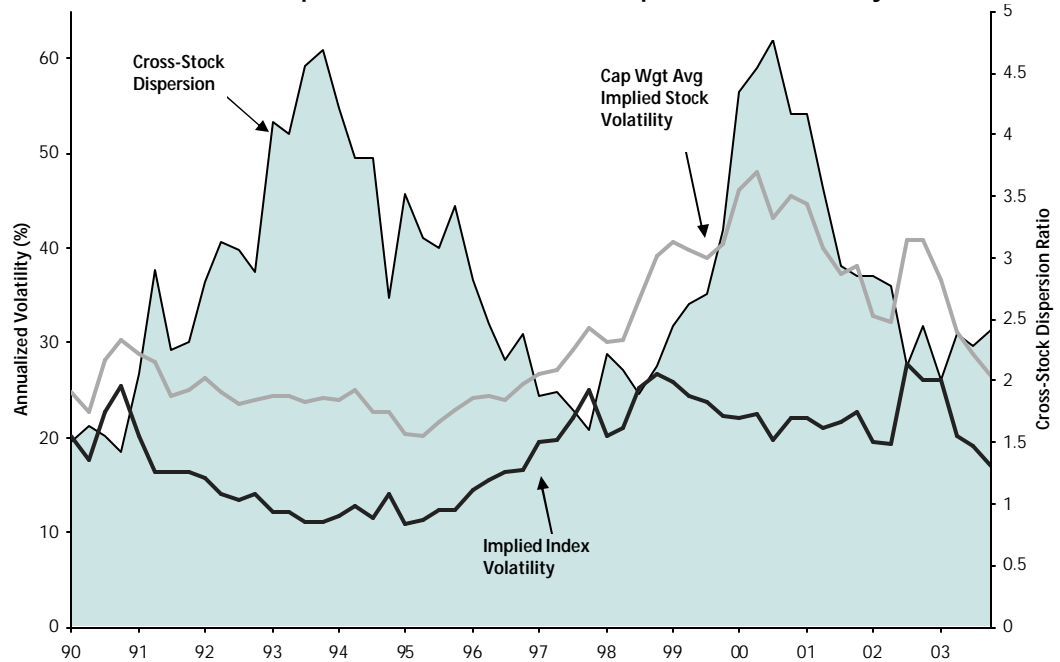
4. **Cross-stock correlation / stock dispersion.** Market environments characterized by high correlation across stocks, or equivalently low dispersion across stocks, make it more difficult for active managers to extract value from differentiating between attractive and unattractive companies. When macro concerns dominate the financial landscape, micro or fundamental characteristics – the main drivers behind active bets – contribute proportionately less to stock returns. Consequently, the alpha from stock selection is lower. We measure stock dispersion by the ratio of stock variance to index variance.<sup>6</sup> We expect the relation between active manager outperformance and the cross-stock dispersion measure to be positive.

Exhibit 4 shows the cross-stock dispersion and the volatility metrics driving dispersion back to 1990 for S&P 500 stocks. Note the periods of highest dispersion, 1993-95 and 2000-01, were periods when the alpha of large cap managers was at the higher end of its range. In contrast, the rising equity market of 1996-98 and the 2002-03 period

<sup>6</sup> More precisely, we calculate the average market-cap weighted implied stock variance in the S&P 500 universe divided by the average implied variance of the S&P 500 index during the quarter. To assess the level of correlation across stocks, we actually use the inverse of the dispersion ratio as a proxy for correlation and track it on a daily basis.

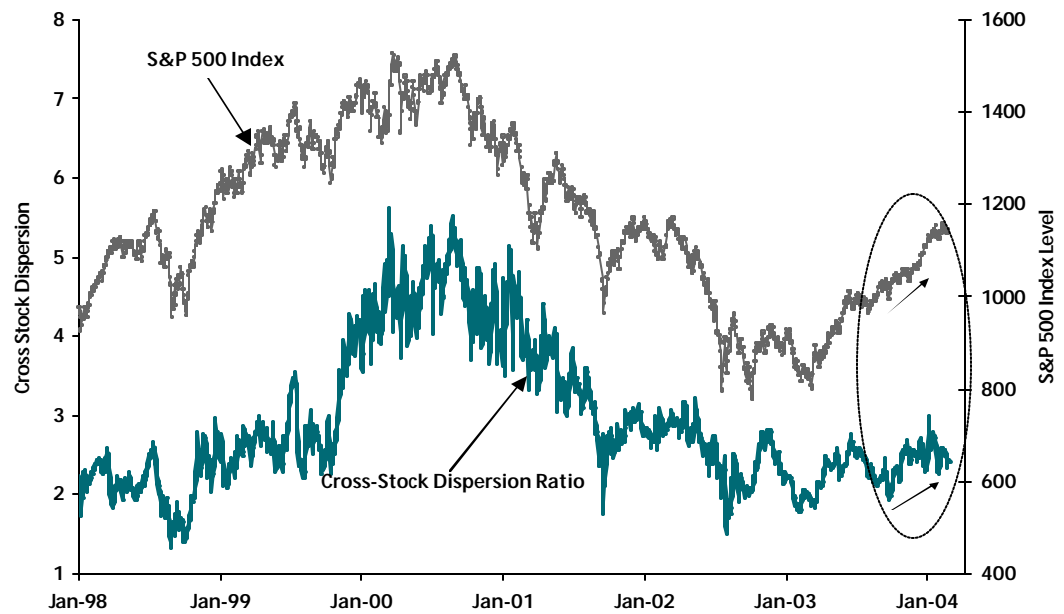
when stocks were moving from shifts in risk preferences have been periods of low dispersion and a difficult environment for alpha-generating processes, especially for those focused on company fundamentals.

**Exhibit 4: Cross-stock dispersion still at low levels compared to the last 13 years ...**



Source: Standard & Poor's, FAME US and Goldman Sachs.

**Exhibit 5: ... but dispersion is on the rise in 2003**



Source: Standard & Poor's, FAME US and Goldman Sachs.

In particular over the two-year period ending in 2003Q1, cross-stock dispersion was quite low compared to levels back to 1990 (Exhibit 4). The market was buffeted by “macro” risk factors, ranging from terrorist attacks and a war in Iraq, to a crisis of confidence in the quality of financial disclosure from corporate America. These macro factors led to stocks moving together at the highest rate since 1998 or, in other words, cross-stock dispersion reaching a low since 1998. Although equity return volatility was high, most of the volatility was driven by the overall market or index factor rather than by specific company events, compressing the dispersion ratio. In the past year, however, dispersion has picked up again as the overall market recovered (Exhibit 5).

**The market factors that drive the dynamics of alpha can be motivated based on intuition; they can also be justified based on multi-factor asset pricing models.**

Comparing our list of factors to the factors included in the Fama-French three-factor model, we find overlap for three factors out of four. Extensions of the Fama-French model also incorporate *momentum* as a driver of stock returns, so we augment our original list of four potential drivers of alpha to five by adding momentum to our list.

5. **Momentum.** To the extent that active managers try to capture momentum in a stock, a market characterized by momentum might allow them to realize higher excess returns than a market that trades sideways. We measure momentum using the Fama-French definition, which uses price momentum over an 11-month window, lagged by one month and adjusted for size. If this factor has an impact on active manager outperformance, we expect it to be positive.

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Exhibit 6 summarizes the hypothesized influences of all of the above factors on the performance of the median active manager. We analyzed the impact of these factors on the excess performance of the median active manager in two ways:

1. **Correlation analysis**, which evaluates the influence of each factor separately
2. **Multiple regression analysis**, which evaluates the influence of all factors combined and takes into account that some of the factors might be interrelated.

**Exhibit 6: Summary of candidate factors to explain the excess performance of active managers**

	Cash-drag	Small-cap tilt	Style dominance	Cross-stock dispersion	Momentum
<b>Fama-French Factor</b>	Market (R <sub>m</sub> - R <sub>f</sub> )	Small-Cap (SMB)	Value (HML)	N/A	Momentum (UMD)
<b>Expected Impact on Manager Excess Return</b>	-	+	+	+	+
<b>Proxy for Factor</b>	S&P 500 - Treasury Bill Return	Russell 2000 - S&P 500 Return	Russell Value - Growth Return	Ratio of Stock to Index Variance	High 11-Mth Price Return - Low 11-Mth Price Return

Source: Fama and French and Goldman Sachs.

The main conclusions from both analyses are the following (Exhibits 7 and 8):

**Large-cap Core:** The large-cap core median manager did indeed suffer from cash-drag, performed better when the market was tilted in the direction of small-cap and value stocks, and benefited from dispersion across stocks. Momentum did not seem to matter in alpha generation. While these findings hold for the full period that we investigated (1990Q1 to 2003Q4), they are **most pronounced in the most recent years** (1997Q1 to 2003Q4).

**Large-cap Value:** Cross-stock dispersion emerges as the main contributor to the alpha of the median large-cap value manager. Cash-drag did not have a significant impact on the alpha of large-cap value managers, while momentum subtracted from his relative performance.

**Exhibit 7: Large-cap manager results** (Correlations and regression estimates in Appendix)

**A: Impact of each factor individually**

<i>Large-cap</i>	Cash Drag	Small Cap Tilt	Value Tilt	Cross-Stock Dispersion	Momentum
<b><i>1990 to 2003</i></b>					
Core	-	+	++	+	
Value		+		+	-
Growth		+			+
<b><i>1997 to 2003</i></b>					
Core	-		++	+	
Value		+	+	+	
Growth					
<b><i>1990 to 1996</i></b>					
Core		+			
Value		+	--		-
Growth		++			

**B: Impact of all factors combined**

<i>Large-cap</i>	Cash Drag	Small Cap Tilt	Value Tilt	Cross-Stock Dispersion	Momentum	Adjusted R-square
<b><i>1990 to 2003</i></b>						
Core	-	++	+			58%
Value	-	+			-	38%
Growth		++	+		++	45%
<b><i>1997 to 2003</i></b>						
Core			+			67%
Value				+	-	58%
Growth			+		+	33%
<b><i>1990 to 1996</i></b>						
Core	-	++				58%
Value	-	++	--	+	--	88%
Growth		++			+	64%

Note: - indicates significantly negative at the 5% level; -- indicates significantly negative at the 0.01% level; + indicates significantly positive at the 5% level; ++ indicates significantly positive at the 0.01% level.

Source: Russell/Mellon Analytical Services, Frank Russell & Co., Ibbotson Associates, FAME US, Fama-French.



**Large-cap Growth: Momentum jumps to the forefront as the driver behind growth alpha**, as the median large-cap growth manager's performance does not follow the pattern of his core or value counterparts. None of the factors in our candidate list have been reliable indicators of the alpha of the median large-cap growth manager when analyzed separately. Small-cap tilted markets helped him in the first part of the 90s, but did not help him in the second half of our sample. **It appears that outperformance for large-cap growth managers is more related to stock (or industry) selection than systematic market factors.**

**Small-cap Core:** The excess returns of the median small-cap core manager seem to be independent of our list of factors and more linked to manager expertise. This suggests that small-cap managers add alpha on top of a benchmark in a different way than their large-cap colleagues. A number of our factors in fact worked counterintuitive during

**Exhibit 8: Small-cap results** (Correlations and regression estimates included in Appendix)

**A: Impact of each factor individually**

<i>Small-cap</i>	Cash Drag	Small Cap Tilt	Value Tilt	Cross-Stock Dispersion	Momentum
<b><u>1990 to 2003</u></b>					
Core					+
Value			--		
Growth					++
<b><u>1997 to 2003</u></b>					
Core			+		
Value			-		
Growth					+
<b><u>1990 to 1996</u></b>					
Core		-	-	-	
Value		-	-	-	
Growth			-	-	+

**B: Impact of all factors combined**

<i>Small-cap</i>	Cash Drag	Small Cap Tilt	Value Tilt	Cross-Stock Dispersion	Momentum	Adjusted R-square
<b><u>1990 to 2003</u></b>						
Core						6%
Value			-			24%
Growth					+	27%
<b><u>1997 to 2003</u></b>						
Core			+		+	25%
Value						36%
Growth					+	40%
<b><u>1990 to 1996</u></b>						
Core		-	--	-		71%
Value		-	-			58%
Growth		-	-	-	+	56%

Note: - indicates significantly negative at the 5% level; -- indicates significantly negative at the 0.01% level; + indicates significantly positive at the 5% level; ++ indicates significantly positive at the 0.01% level.

Source: Russell/Mellon Analytical Services, Frank Russell & Co., Ibbotson Associates, FAME US, Fama-French.

the first half of the 90s. For small-cap managers, the argument can be made that, to the extent that they ignore micro-cap names in their universes (e.g., because of liquidity constraints), the small-cap tilt should not play a positive role.

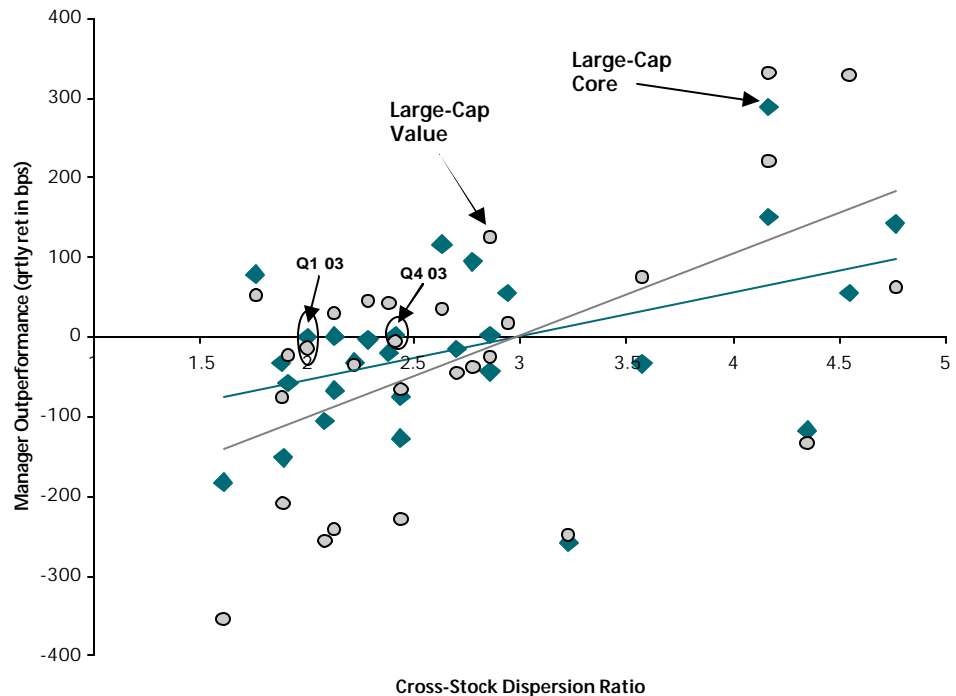
**Small-cap Value:** Performance of the median manager in this category presents a bit of a puzzle as well. When the market was *not* value-orientated, his ability to generate alpha turned out to be greater.

**Small-cap Growth:** The median manager did well in momentum-driven markets. None of the other factors played a consistent role in his ability to beat his benchmark.

### Importance of cross-stock dispersion

The cross-stock dispersion factor shows up to be quite significant for large-cap core and value managers in our sample in the last seven years when stock and index volatility have mostly been at normal or above normal levels. Exhibit 9 graphs large-cap core and value alpha against cross-stock dispersion. The correlation coefficient in the last seven years was 0.44 for large-cap core managers and 0.58 for value managers, more significant than any other factor for this latter group. It is logical that value managers would be most sensitive to dispersion because a “value” process relies on stock prices moving with factors that compare a company’s ability to deliver earnings to its price.

**Exhibit 9: Cross-stock dispersion correlates well with the alpha of large-cap core and value managers** (Quarterly data from 1997Q1 to 2003Q4)



Source: Russell/Mellon Analytical Services, Frank Russell & Co., Standard & Poor's and FAME US.

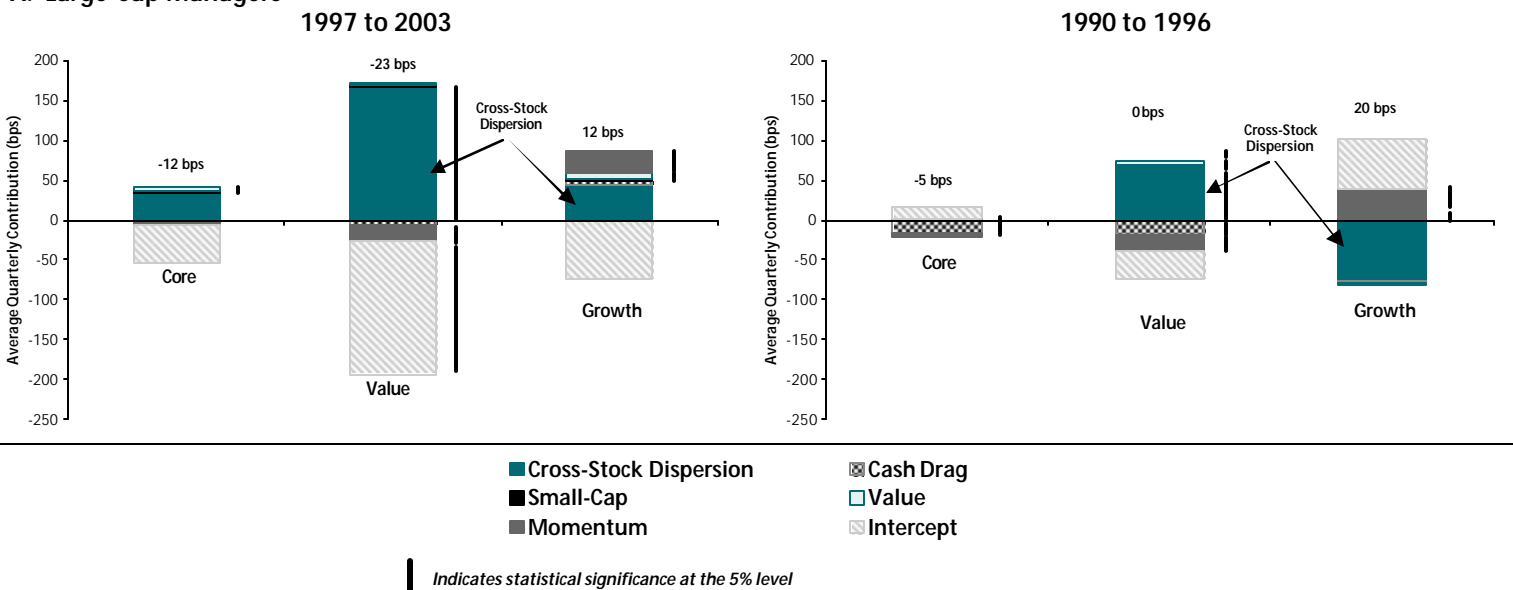
Exhibits 10A and 10B break out the relative importance of each factor to the average quarterly alpha of each group of managers for the first seven years of the 1990s and for the most recent period. Even though cross-stock dispersion is not statistically significant for all groups, it contributes a large proportion of the average quarterly outperformance, especially for large-cap core and value managers in the most recent

period. For example, the median large-cap core manager underperformed the Russell 1000 index by 12 bps on average per quarter since 1997Q1. This -12 bps consists of the following parts: -2 bps attributable to cash drag, +1 bp attributable to small-cap tilt, +5 bps attributable to value tilt, +35 bps attributable to cross-stock dispersion, -3 bps attributable to momentum and -48 bps not related to the market-wide factors.

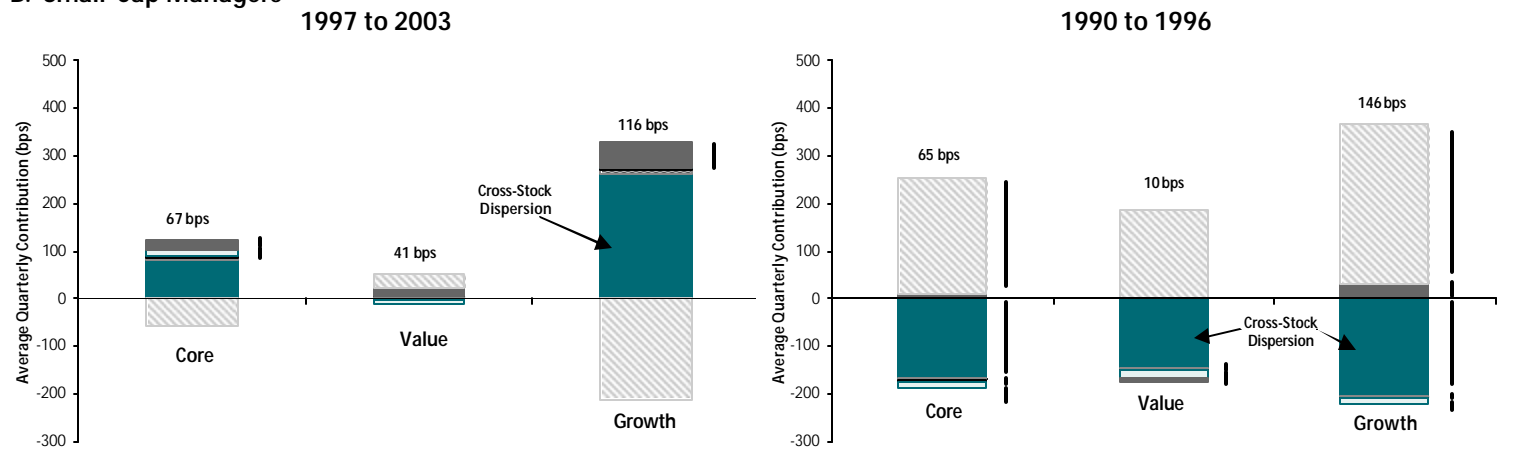
Our analysis also shows that the importance of cash drag and a small-cap bias to active managers has diminished over time. While the small-cap tilt related most strongly with large-cap alpha in the first half of our sample, and cash-drag created a considerable obstacle for large-cap core and value managers in particular, neither factor mattered in the second half of our sample. Even though these factors had significant explanatory power earlier on, their contribution to average quarterly alpha in terms of bps was always marginal (Exhibits 10A and 10B).

**Exhibit 10: Cross-stock dispersion contributed a large proportion of quarterly median excess performance in the past seven years**

**A. Large-Cap Managers**



**B. Small-Cap Managers**



Source: Russell/Mellon Analytical Services, Frank Russell & Co., Standard & Poor's and FAME US.

## Conclusion

We find that systematic factors, including market direction and cross-stock dispersion, have been important in past and potential return of active managers relative to benchmarks. **Investors should consider these factors in deciding the allocation to active versus benchmark risk, depending on market conditions and the segment of the market in which they invest:**

1. If you are evaluated relative to benchmark, it is important to keep the influence of cash drag at a minimum, especially in strong return markets.
2. If you believe that dispersion across stocks is on the rise or value factors will dominate, large-cap core and value managers in particular should be in a good position to beat their benchmarks. These managers may wish to take more active risk at this time rather than hug their benchmarks.
3. If you believe that momentum will characterize the equity market, it might be an opportune time to increase your allocation to active growth managers.
4. Small-cap managers seem to be less exposed to systemic market factors, and a decision to allocate more or less weight to small-cap managers should therefore be less motivated by market circumstances and more by the manager's investment process.

## Related reports

*When do enhanced indexation managers add alpha?*, Ingrid Tierens, Goldman Sachs Equity Derivatives Strategy, Updated March 1, 2004.

*When do hedge fund managers add alpha?*, Sandy Rattray and Venkatesh Balasubramanian, Goldman Sachs Equity Derivatives Strategy, Updated March 1, 2004.

*How much "error" in tracking error? The link with changes in stock volatility and cross-stock dispersion*, Ingrid Tierens and Alfke Kierspel, Goldman Sachs Equity Derivatives Strategy, Index and Derivatives Perspective (Part II), July 2003.

*Shifting from a "macro" to a "bottom-up" market – Reading the option tea leaves*, Joanne M. Hill and Maria M. Grant, Goldman Sachs Equity Derivatives Strategy, May 6, 2003.

*How much "error" in tracking error?*, Ingrid Tierens and Alfke Kierspel, Goldman Sachs Equity Derivatives Strategy, Index and Derivatives Perspective (Part II), April 2003.

*Dynamic factors in active manager outperformance – Some new evidence*, Joanne M. Hill, Goldman Sachs Equity Derivatives Strategy, Index and Derivatives Perspective (Part II), January 2002.

*Domestic Equity Benchmark Underperformance*, Joanne M. Hill, Robert C. Jones and John H. Taylor, Pension & Endowment Forum, Goldman Sachs, June 1996.

## Appendix 1: The spread between the alpha added by top and bottom quartile managers changes through time

Our results are based on universes of managers that change through time. Exhibit A1 shows the number of managers included in each universe. Most active managers fall in the large-cap core universe, while the split between value and growth managers is almost 50/50.

The spread between the annual excess performance of the bottom and top quartile manager was on average wider for small-cap managers than for large-cap managers. In addition, the top quartile manager performed markedly better in the small-cap universe than in the large-cap universe, regardless of the style (Exhibit A2).

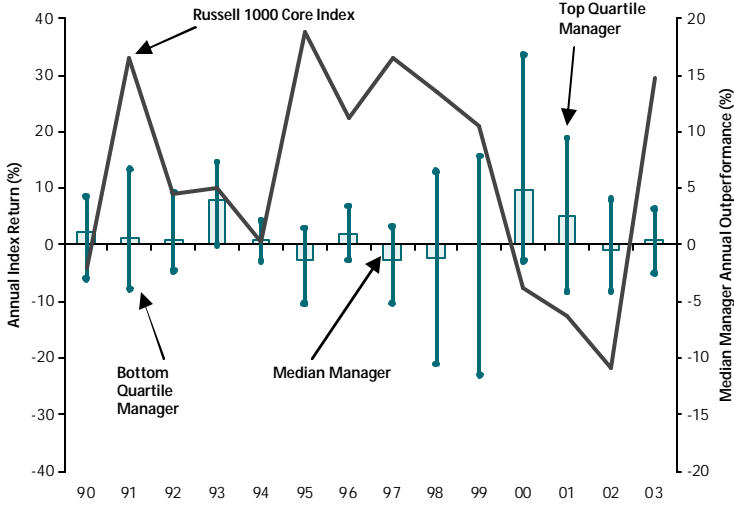
**Exhibit A1: Large-cap core managers form the largest proportion of the active managers included in the six size / style universes** (Annual data from 1990 to 2003)

Universe	Number of Managers in 1990	Number of Managers in 2003
Large-Cap Core	97	424
Large-Cap Value	20	110
Large-Cap Growth	24	91
Small-Cap Core	39	282
Small-Cap Value	17	109
Small-Cap Growth	11	106

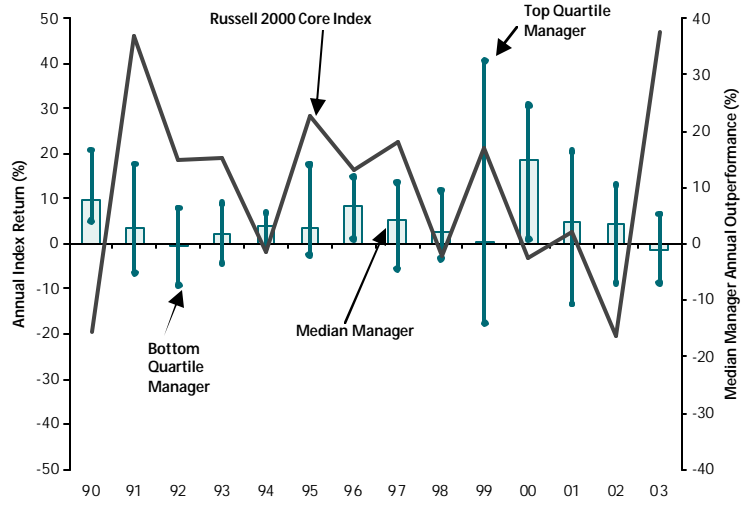
Source: Russell/Mellon Analytical Services.

**Exhibit A2: The spread between top and bottom quartile performance has narrowed in recent years (Annual 1990 to 2003)**

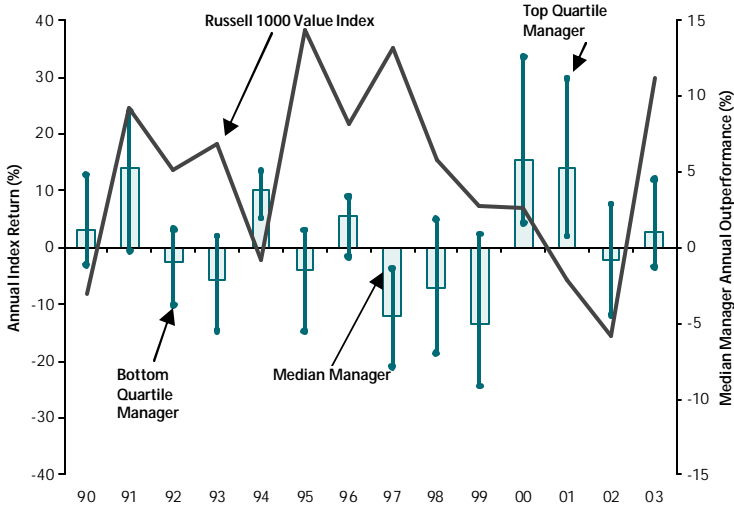
**A: Large-cap Core**



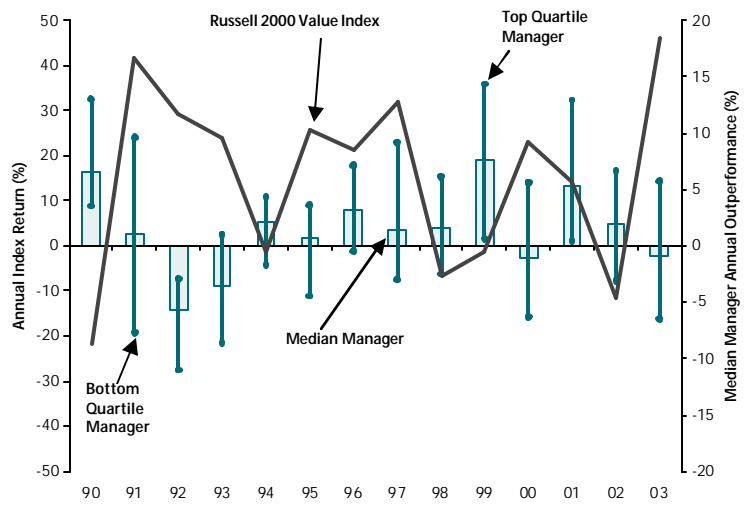
**D: Small-cap Core**



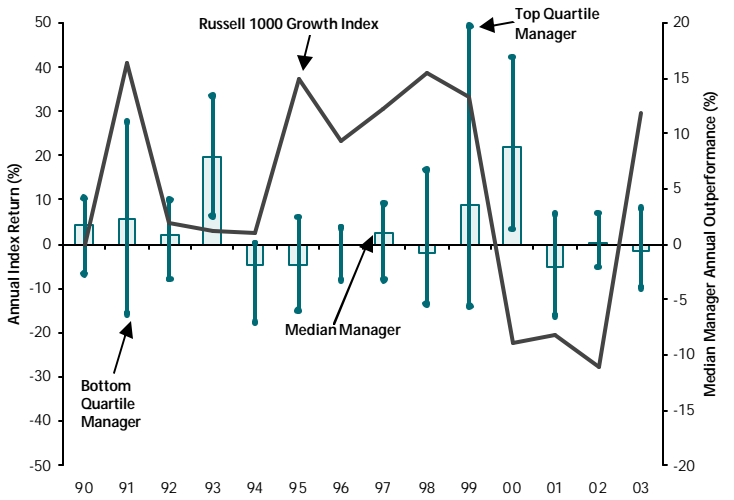
**B: Large-cap Value**



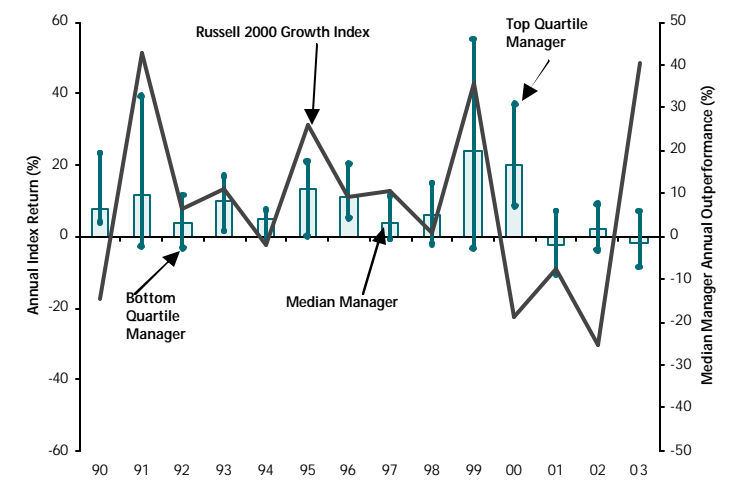
**E: Small-cap Value**



**C: Large-cap Growth**



**F: Small-cap Growth**



Source: Russell/Mellon Analytical Services and Frank Russell & Co.

## Appendix 2: Impact of benchmark choice in evaluating active manager performance in the small-cap manager universe

Comparing performance to a benchmark implicitly assumes we use the correct benchmark to measure a portfolio's performance against. This is not an issue for large-cap managers, with different large-cap benchmarks telling the same story about how the large-cap segment performed each quarter. **For small-cap managers on the other hand, the choice of benchmark can have a crucial impact.**

The main competitors to measure small-cap performance – the Russell 2000 Core index and the S&P SmallCap index – have diverged widely since the inception of the S&P SmallCap index. S&P SmallCap has outperformed Russell 2000 by 3.4% on an annualized basis from January 1994 to December 2003.<sup>7</sup>

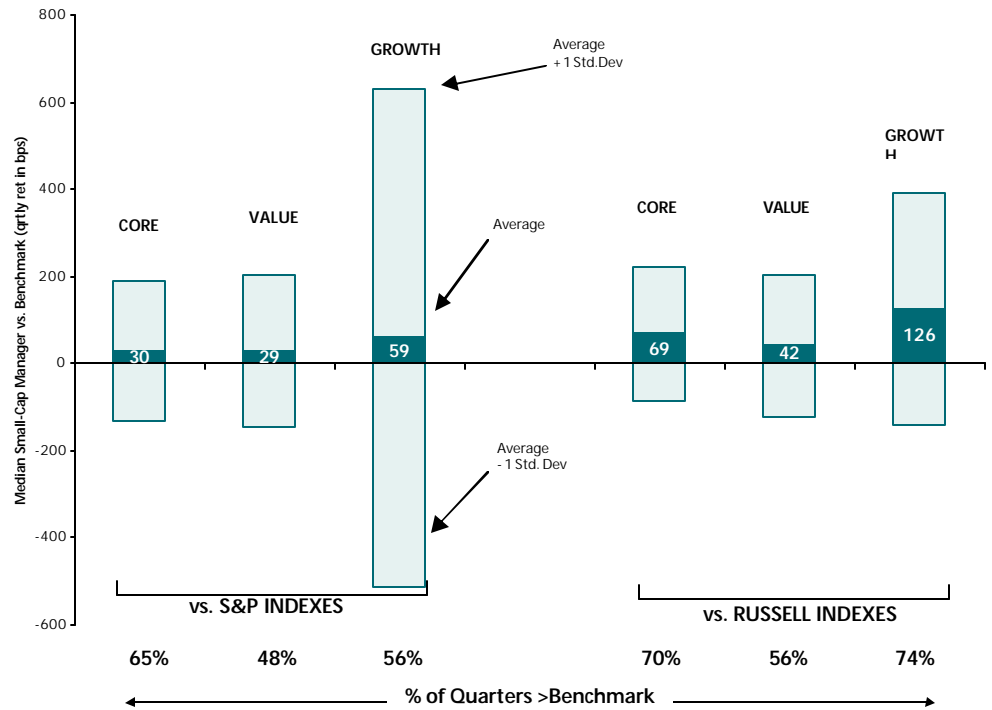
Suppose that all active small-cap managers are benchmarked against the S&P SmallCap index instead of the Russell 2000 index, but we compare their performance against the Russell 2000 index. Under this scenario, our results for the small-cap active managers will be biased upwards as we compare against a benchmark that has traditionally underperformed the true benchmark. Russell/Mellon Analytical Services does not provide the true benchmark for each manager, but assigns portfolios to any of the six Russell-defined universes (large-cap core, value and growth, and small-cap core, value and growth) based on the characteristics of the portfolio. To test if our better alpha numbers for small-cap are driven by the choice of benchmark, we go to the other extreme and assume that all small-cap managers should be judged against the S&P SmallCap indexes.

**Even when we assess the performance of small-cap managers against the more challenging hurdle posed by the S&P small-cap indexes, the results still suggest better relative performance in the small-cap manager universe than in the large-cap manager universe.** The median quarterly performance drops most severely for the median small-cap growth manager, who outperformed by 126 bps on average per quarter during the period 97Q2 to 03Q4 when evaluated against the Russell 2000 Growth index, but by only 59 bps when evaluated against the S&P SmallCap Growth index (Exhibit A3). In spite of the drop in excess performance, the median manager still outperformed the appropriate S&P benchmark about half or more of the time (bottom of Exhibit A3).

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<sup>7</sup> See our report "S&P SmallCap usually outperforms Russell 2000 in July" by Maria Grant and Ingrid Tierens, July 2, 2002. The historical outperformance of the S&P over Russell reversed in 2003, with Russell 2000 outperforming S&P SmallCap by 8.4%.

**Exhibit A3: The S&P indexes pose a more challenging hurdle for the median small-cap manager** (Quarterly data from 1994Q1 to 2003Q4 for core, and from 1997Q2 to 2003Q4 for value and growth)



Source: Russell/Mellon Analytical Services and Frank Russell & Co.



## Appendix 3: Correlation of market-wide factors with the alpha of active managers

Exhibit A4: Correlation of each factor with the performance of the median large-cap and small-cap active manager

<i>Large-cap</i>	Cash Drag	Small Cap Tilt	Value Tilt	Cross-Stock Dispersion	Momentum
<b><i>1990 to 2003</i></b>					
Core	<b>-0.36</b>	<b>0.45</b>	<b>0.63</b>	<b>0.29</b>	-0.22
Value	-0.15	<b>0.48</b>	0.18	<b>0.28</b>	<b>-0.37</b>
Growth	-0.08	<b>0.46</b>	0.25	0.16	<b>0.28</b>
<b><i>1997 to 2003</i></b>					
Core	<b>-0.40</b>	0.37	<b>0.80</b>	<b>0.44</b>	-0.22
Value	-0.34	<b>0.49</b>	<b>0.53</b>	<b>0.58</b>	-0.37
Growth	-0.19	0.24	0.37	0.33	0.33
<b><i>1990 to 1996</i></b>					
Core	-0.27	<b>0.63</b>	0.04	0.06	-0.23
Value	0.14	<b>0.45</b>	<b>-0.74</b>	-0.08	<b>-0.40</b>
Growth	0.10	<b>0.69</b>	0.08	-0.01	0.25
<b><i>Small-cap</i></b>					
<b><i>1990 to 2003</i></b>					
Core	-0.20	-0.25	0.10	-0.12	<b>0.31</b>
Value	0.20	-0.07	<b>-0.51</b>	-0.25	0.18
Growth	-0.12	-0.15	-0.17	-0.01	<b>0.57</b>
<b><i>1997 to 2003</i></b>					
Core	-0.34	-0.05	<b>0.46</b>	0.30	0.32
Value	0.37	0.29	<b>-0.58</b>	-0.02	0.19
Growth	-0.12	0.08	-0.10	0.30	<b>0.59</b>
<b><i>1990 to 1996</i></b>					
Core	-0.02	<b>-0.45</b>	<b>-0.60</b>	<b>-0.47</b>	0.37
Value	0.02	<b>-0.39</b>	<b>-0.59</b>	<b>-0.42</b>	0.20
Growth	-0.05	-0.37	<b>-0.51</b>	<b>-0.47</b>	<b>0.50</b>

NOTE: Bold indicates significant at the 5% level.

Source: Russell/Mellon Analytical Services, Frank Russell &amp; Co., Ibbotson Associates, FAME US, Fama-French.

## Appendix 4: Regression of alpha of active managers on market-wide factors

Exhibit A5: Multiple regression analysis of the performance of the median large-cap and small-cap active manager on market-wide factors

<i>Large-cap</i>	Intercept	Cash Drag	Small Cap Tilt	Value Tilt	Cross-Stock Dispersion	Momentum	Adjusted R-square
<b>1990 to 2003</b>							
Core	0.022	<b>-0.036</b>	<b>0.071</b>	<b>0.058</b>	-0.008	-0.015	<b>58%</b>
Value	-0.491	<b>-0.078</b>	<b>0.107</b>	-0.032	0.253	<b>-0.073</b>	<b>38%</b>
Growth	0.200	0.026	<b>0.173</b>	<b>0.086</b>	-0.157	<b>0.109</b>	<b>45%</b>
<b>1997 to 2003</b>							
Core	-0.482	-0.016	0.044	<b>0.083</b>	0.126	-0.010	<b>67%</b>
Value	-1.686	-0.053	0.076	0.031	<b>0.606</b>	<b>-0.062</b>	<b>58%</b>
Growth	-0.744	0.043	0.080	<b>0.095</b>	0.159	<b>0.094</b>	<b>33%</b>
<b>1990 to 1996</b>							
Core	0.156	<b>-0.068</b>	<b>0.094</b>	-0.012	-0.005	-0.014	<b>58%</b>
Value	-0.347	<b>-0.075</b>	<b>0.092</b>	<b>-0.266</b>	<b>0.231</b>	<b>-0.078</b>	<b>88%</b>
Growth	0.635	-0.015	<b>0.271</b>	0.071	-0.261	<b>0.138</b>	<b>64%</b>

<i>Small-cap</i>	Intercept	Cash Drag	Small Cap Tilt	Value Tilt	Cross-Stock Dispersion	Momentum	Adjusted R-square
<b>1990 to 2003</b>							
Core	1.182	-0.009	-0.038	0.023	-0.243	0.060	<b>6%</b>
Value	1.124	-0.018	-0.017	<b>-0.110</b>	-0.274	0.022	<b>24%</b>
Growth	0.775	-0.001	0.001	-0.039	0.044	<b>0.159</b>	<b>27%</b>
<b>1997 to 2003</b>							
Core	-0.576	0.047	0.023	<b>0.096</b>	0.293	<b>0.078</b>	<b>25%</b>
Value	0.295	0.029	0.089	-0.057	-0.012	0.056	<b>36%</b>
Growth	-2.119	0.061	0.042	0.009	0.955	<b>0.183</b>	<b>40%</b>
<b>1990 to 1996</b>							
Core	<b>2.452</b>	-0.018	<b>-0.184</b>	<b>-0.258</b>	<b>-0.573</b>	0.032	<b>71%</b>
Value	1.861	-0.022	<b>-0.184</b>	<b>-0.280</b>	-0.496	-0.029	<b>58%</b>
Growth	<b>3.369</b>	-0.020	<b>-0.123</b>	<b>-0.199</b>	<b>-0.697</b>	<b>0.114</b>	<b>56%</b>

NOTE: Bold indicates significant at the 5% level.

Source: Russell/Mellon Analytical Services, Frank Russell &amp; Co., Ibbotson Associates, FAME US, Fama-French.

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