

Style Bias and Active Performance

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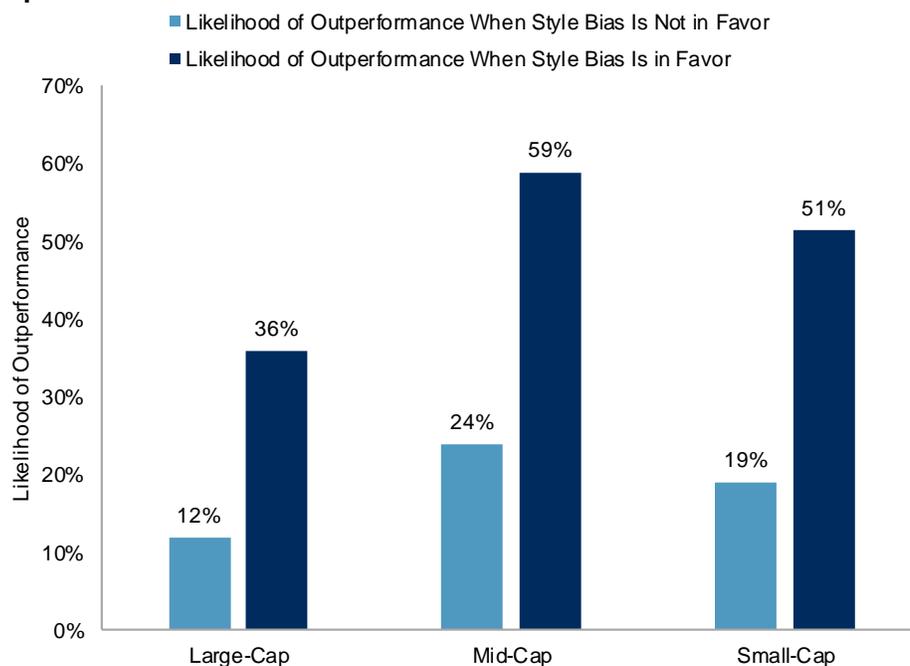
“All that glitters is not gold.”

- *The Merchant of Venice*, Act 2

EXECUTIVE SUMMARY

- Style bias plays a major role in explaining active manager outperformance across the capitalization spectrum.
- Active managers of large-capitalization portfolios tend to tilt down the cap scale, while mid- and small-cap managers tend to tilt up. Consequently, large-cap managers are most challenged when large-cap stocks beat mid- and small-caps. Mid- and small-cap managers have the opposite tendency.
- As Exhibit 1 illustrates, the likelihood that a majority of managers in a given capitalization tranche will outperform is importantly dependent on style favorability.
- Similar results apply for fixed income managers.

Exhibit 1: Style Bias Has Been a Key Driver of Active Manager Outperformance



Source: S&P Dow Jones Indices LLC. Data from Q1 2002 to Q4 2020. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

A SIMPLE QUESTION

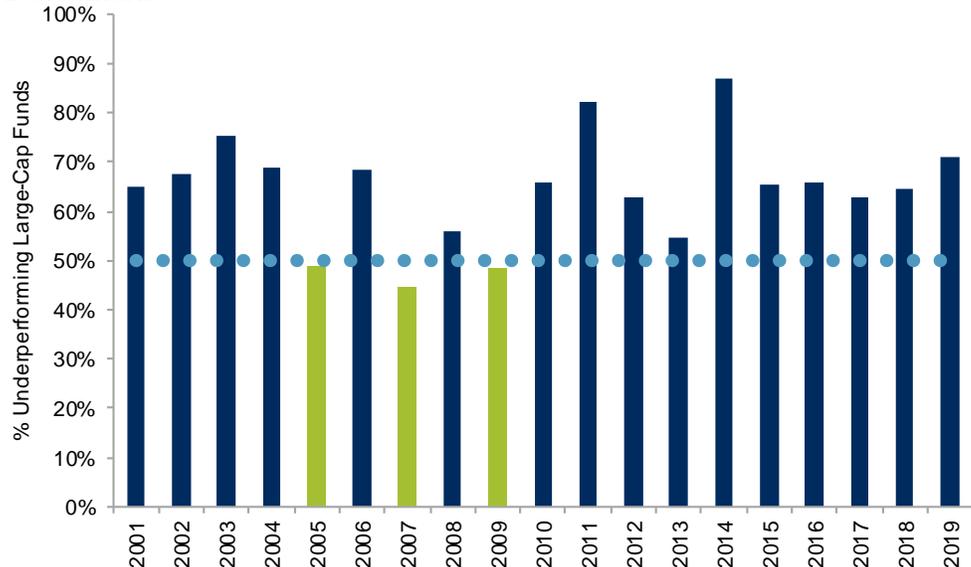
The evidence that most active managers typically underperform passive benchmarks is extensive.

The evidence that most active portfolio managers typically underperform passive benchmarks appropriate to their investment style is extensive—both historically and geographically.¹ Exhibit 2, for example, summarizes data from our firm’s SPIVA® Scorecards,² which have documented the performance of U.S. managers since 2001 (with shorter histories for other markets).³ Of the 19 full calendar years for which we have U.S. SPIVA results, the majority of large-cap active managers outperformed the [S&P 500®](#) in only three.⁴

This paper asks a simple question: **what (if anything) distinguishes the three years when most active managers outperformed from the 16 years when the majority failed?**

Of the 19 years for which we have U.S. SPIVA results, the majority of large-cap active managers outperformed the S&P 500 in only three.

Exhibit 2: The Majority of Active Managers Underperformed Passive Benchmarks



Source: S&P Dow Jones Indices LLC. Data from December 2001 to December 2019. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

What distinguishes the three years when most active managers outperformed from the 16 years when the majority failed?

SOURCES OF OUTPERFORMANCE

An active manager benchmarked against the S&P 500 can access a number of sources of outperformance; indeed, **any dimension upon which his portfolio might differ from the index is a potential source of value added.** A manager might, for example, decide that equities are overvalued relative to bonds or cash and therefore hold substantial fixed income positions. If his forecast is correct, the resulting portfolio is likely to

¹ Ganti, Anu and Craig J. Lazzara, “[Shooting the Messenger](#),” S&P Dow Jones Indices, December 2017.

² See <https://www.spqlobal.com/spdji/en/research-insights/spiva/>.

³ Liu, Berlinda and Gaurav Sinha, “[SPIVA U.S. Mid-Year 2020](#),” S&P Dow Jones Indices, September 2020.

⁴ Results for mid- and small-cap managers are somewhat better but hardly encouraging.

INDEX INVESTMENT STRATEGY

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An active manager benchmarked against the S&P 500 can access a number of sources of outperformance.

outperform the S&P 500, which is by definition a fully-invested equity measure.

Our SPIVA data are limited to mutual fund managers, who typically do not have the flexibility to move into different asset classes (beyond a limited allocation to cash equivalents for operational purposes); the ability of equity managers to add value is limited to whatever they can accomplish within the equity market. That said, a manager whose performance is compared to the S&P 500 can typically buy stocks which are not S&P 500 members. Even if she cannot or does not, the difference in returns between the S&P 500 and [S&P MidCap 400®](#) provides an important clue to understanding performance.

Our SPIVA data are limited to mutual fund managers, who typically do not have the flexibility to move into different asset classes.

STYLE BIAS AND ACTIVE PERFORMANCE

The word “bias” often has a pejorative connotation; we use the term here simply to identify a portfolio’s systematic tendencies.⁵ A portfolio benchmarked to the S&P 500 might generally tilt toward smaller stocks or value stocks, for example, producing a small-cap bias or a value bias.

The importance of such style biases, for our purposes, can be proxied by the difference between the performance of two indices. For example, suppose a manager’s performance is evaluated by comparison with the S&P MidCap 400. If, in a given year, the S&P 500 outperforms the S&P 400™, the manager can add value by tilting up the capitalization scale.⁶ A bias toward larger-cap names would pay off in that circumstance.

The importance of such style biases, for our purposes, can be proxied by the difference between the performance of two indices.

It’s important to stress that measuring the gap between the S&P 400 and S&P 500 (say) is simply a *proxy* for the shifting location of the best returns. Managers benchmarked against the S&P 500 do not need to buy mid-cap stocks if they want to move down the capitalization scale. If the S&P 400 is outperforming the S&P 500, it’s quite likely that the smallest stocks in the S&P 500 are outperforming the largest.⁷

Our SPIVA U.S. Scorecards typically use 12-month lookback periods, but the underlying data have been available on a quarterly basis since 2002. Exhibit 3 uses these quarterly data to examine the performance of large-cap active managers. **There were 19 quarters during which the majority of active managers outperformed the S&P 500. In 15 of those quarters, the S&P 400 beat the S&P 500.**

⁵ “Systematic,” in this context, connotes a strategic or normal allocation. It’s certainly possible for a manager to make *tactical* forays away from his normal portfolio; we are more concerned here with the normal portfolio itself.

⁶ See also Ferri, Rick, “[Messy Funds and the Illusion of Skill](#),” TEBI, Aug. 3, 2019.

⁷ Between 2001 and 2020, the S&P MidCap 400 outperformed the S&P 500 12 times. In 10 of those years, the [S&P 500 Equal Weight Index](#) outperformed its cap-weighted counterpart.

There were 19 quarters during which the majority of active managers outperformed the S&P 500.

From a different perspective, when the S&P 400 beat the S&P 500 (which happened in 42 quarters), the probability that most large-cap managers outperformed the S&P 500 was 36% (15/42). When the S&P 500 beat the S&P 400, the likelihood that a majority of large-cap managers outperformed the S&P 500 fell to 12% (4/34). The odds were not favorable in either circumstance but were **substantially better when the S&P 400 outperformed. This result is also consistent with the view that large-cap managers, as a group, have a bias toward smaller-cap names.**

In 15 of those quarters, the S&P 400 beat the S&P 500.

Exhibit 3: Large-Cap Managers Perform Better When Mid-Caps Outperform

	S&P 400 OUTPERFORMS S&P 500	S&P 500 OUTPERFORMS S&P 400	TOTAL
Most Large-Cap Managers Outperform	15	4	19
Most Large-Cap Managers Underperform	27	30	57
Total	42	34	76

Source: S&P Dow Jones Indices LLC. Data from Q1 2002 to Q4 2020. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

This result is also consistent with the view that large-cap managers, as a group, have a bias toward smaller-cap names.

We see similar results for mid- and small-cap managers, although the sense of the bias is reversed. Exhibit 4 shows that in the 34 quarters when the S&P 500 beat the S&P MidCap 400, the likelihood that a majority of mid-cap managers would outperform was 59% (20/34). If the S&P MidCap 400 lagged the S&P 500, the likelihood of mid-cap manager success fell to 24% (10/42). Notice that this result implies that mid-cap managers, as a group, had a bias toward larger-cap companies.⁸

Exhibit 4: Mid-Cap Managers Do Better When Large Caps Outperform

	S&P 400 OUTPERFORMS S&P 500	S&P 500 OUTPERFORMS S&P 400	TOTAL
Most Mid-Cap Managers Outperform	10	20	30
Most Mid-Cap Managers Underperform	32	14	46
Total	42	34	76

Source: S&P Dow Jones Indices LLC. Data from Q1 2002 to Q4 2020. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

We see similar results for mid- and small-cap managers, although the sense of the bias is reversed.

Exhibit 5 presents similar data for small-cap managers, now conditioned on the relative performance of the S&P MidCap 400 and [S&P SmallCap 600®](#). The S&P 400 outperformed the S&P 600™ in 39 quarters; in those quarters, the likelihood that a majority of small-cap managers would outperform was 51% (20/39). When the S&P 600 beat the S&P 400, however, the likelihood that most small-cap managers would outperform fell to 19% (7/37). As with mid-cap managers, these results imply that small-cap managers, as a group, have a bias toward larger companies.

⁸ As suggested above, this bias can be expressed either by concentrating toward the top of the capitalization scale within the S&P 400, or by holding stocks too large to be S&P 400 members.

We've noted that the data are consistent with the hypothesis that the average large-cap manager has a small-cap tilt relative to his benchmark...

Exhibit 5: Small-Cap Managers Do Better When Mid-Caps Outperform

	S&P 400 OUTPERFORMS S&P 600	S&P 600 OUTPERFORMS S&P 400	TOTAL
Most Small-Cap Managers Outperform	20	7	27
Most Small-Cap Managers Underperform	19	30	49
Total	39	37	76

Source: S&P Dow Jones Indices LLC. Data from Q1 2002 to Q4 2020. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

CAPITALIZATION BIAS

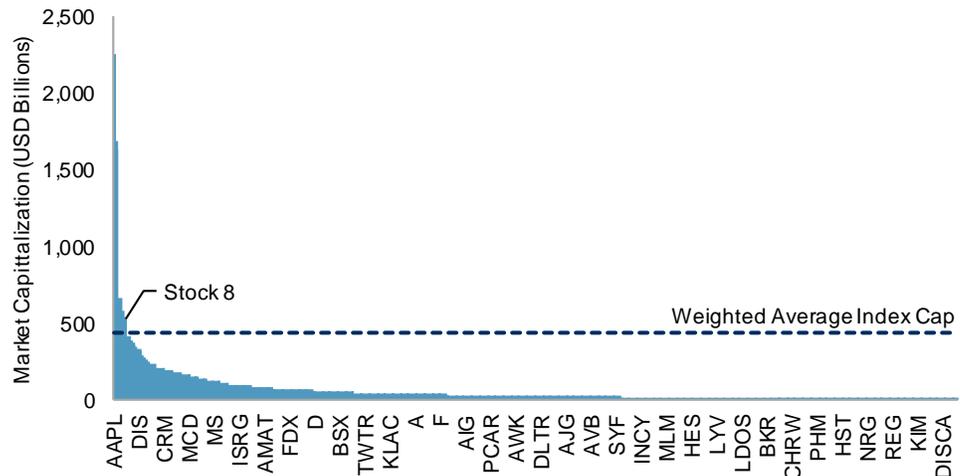
We've noted that the data in Exhibits 3-5 are consistent with the hypothesis that the average large-cap manager has a small-cap tilt relative to his benchmark, whereas the average mid- and small-cap manager has a larger-cap tilt. This hypothesis would explain why **the odds of success for large-cap managers improve when smaller stocks do well, while the odds of success for mid- and small-cap managers improve when larger stocks do well.** But is the hypothesis an accurate description of reality?

...whereas the average mid- and small-cap manager has a larger-cap tilt.

The ideal way to examine this issue would require comprehensive holdings data and is beyond the scope of this paper. But we can obtain a sense of the answer by examining the distribution of capitalization within each of our benchmark indices. Exhibit 6, for example, shows that the S&P 500's capitalization is skewed by a small number of very large companies. At the end of 2020, the weighted average capitalization of the stocks in the S&P 500 was \$436.6 billion. But **only eight of the stocks in the index were larger than that average**; those stocks made up roughly a quarter of the index's total capitalization. An active manager benchmarked against the S&P 500 has virtually no chance of creating a diversified portfolio with a large-cap tilt since doing so would require a substantial overweight in only eight names.

An active manager benchmarked against the S&P 500 has virtually no chance of creating a diversified portfolio with a large-cap tilt...

Exhibit 6: Distribution of S&P 500 Weights Is Highly Skewed



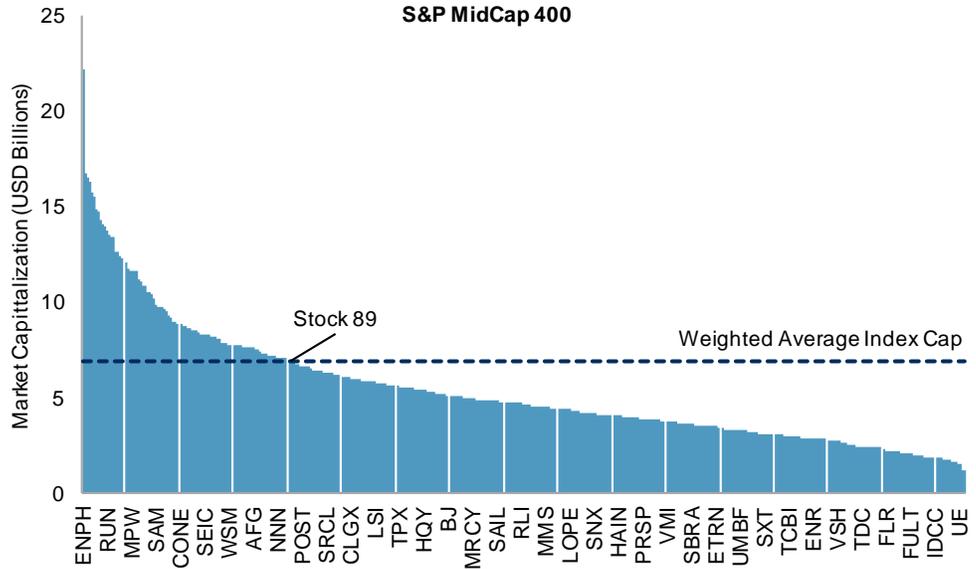
Source: S&P Dow Jones Indices LLC. Data as of Dec. 31, 2020. Chart is provided for illustrative purposes.

...since doing so would require a substantial overweight in only eight names.

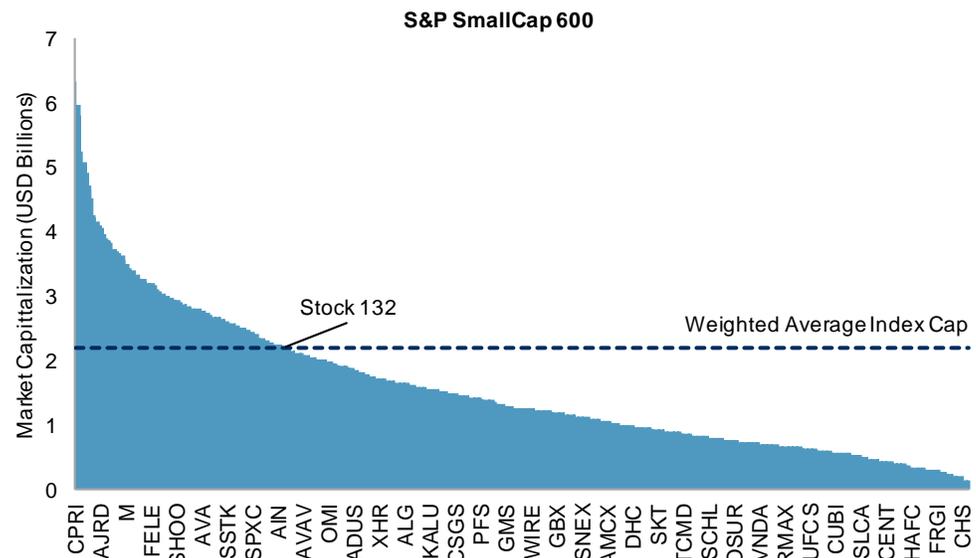
Mid- and small-cap managers face a much less daunting task if they want to create a large-cap tilt relative to their benchmarks.

In contrast, mid- and small-cap managers face a much less daunting task if they want to create a large-cap tilt relative to their benchmarks. Roughly 22% of the names in both the S&P MidCap 400 and the S&P SmallCap 600 are bigger than those indices' weighted average capitalizations, so tilting up the cap scale is feasible for managers who wish to do it. Exhibit 7 illustrates the relatively even distribution of capitalization in the S&P 400 and S&P 600, and Exhibit 8 summarizes results for all three benchmarks.

Exhibit 7: Weights in S&P 400 and S&P 600 Are Much More Evenly Distributed



Roughly 22% of the names in the S&P 400 and the S&P 600 are bigger than those indices' weighted average capitalizations...

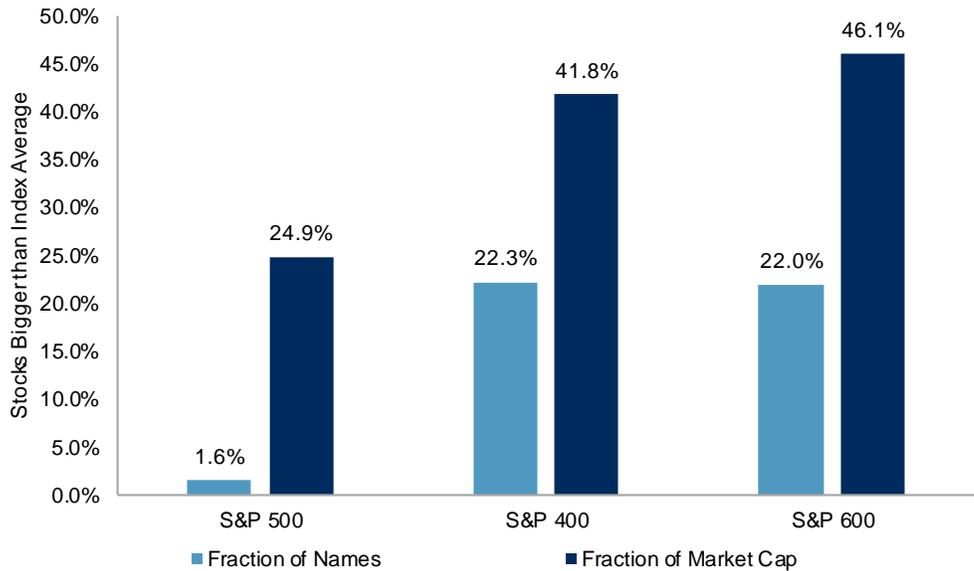


...so tilting up the cap scale is feasible for managers who wish to do it.

Source: S&P Dow Jones Indices LLC. Data as of Dec. 31, 2020. Chart is provided for illustrative purposes.

Exhibit 8: Number of Stocks with Market Capitalization above Index Weighted Average Capitalization

To say that tilting up the capitalization scale is feasible is not to say that mid- and small-cap managers as a group actually do it.



There are at least three reasons to expect that such managers might let their capitalization exposure drift upward.

Source: S&P Dow Jones Indices LLC. Data as of Dec. 2020. Chart is provided for illustrative purposes.

To say that tilting up the capitalization scale is feasible is not to say that mid- and small-cap managers as a group actually do it. But there are at least three reasons to expect that such managers might let their capitalization exposure drift upward.

- *Liquidity* is a positive function of capitalization—from a transaction cost standpoint, it’s easier to tilt large than to tilt small.
- Managers may like to *let their winners run*. If they do, the weighted average capitalization of their portfolios will increase.
- Though it pains us to say it, not all mid- and small-cap managers are benchmarked against S&P DJI indices. If the index against which a manager is actually evaluated has a larger capitalization than the S&P SmallCap 600, e.g., the manager might naturally be drawn to what we would view as a larger-cap bias.⁹

No matter how badly a large-cap manager wants to create a large-cap tilt relative to his benchmark, it’s very hard for a diversified portfolio to do so.

The first two factors would also apply to large-cap managers, of course; their nearly insurmountable difficulty, as we have already seen, comes from the skewed capitalization of the S&P 500. No matter how badly a large-cap manager wants to create a large-cap tilt relative to his benchmark, it’s very hard for a diversified portfolio to do so.

⁹ See for example Brzenk, Philip, Bill Hao, and Aye Soe, “[A Tale of Two Small-Cap Benchmarks: 10 Years Later](#),” S&P Dow Jones Indices, September 2019.

OTHER FORMS OF STYLE BIAS

Among equity funds, we also observe biases between growth and value.

Style bias can take many forms. Among equity funds, we also observe biases between growth and value. Exhibit 9 shows that a majority of large-cap value managers outperformed the [S&P 500 Value](#) in 38% (29/76) of all quarters. In the quarters when the S&P 500 Growth beat the [S&P 500 Value](#), however, the likelihood that the majority of value managers outperformed rose to 58% (25/43). When value outperformed growth, the odds of active outperformance for value managers fell to 12% (4/33). This trend is noticeable for mid- and small-cap value managers as well.¹⁰

In the quarters when the S&P 500 Growth beat the S&P 500 Value, the likelihood that the majority of value managers outperformed rose to 58%.

Exhibit 9: Importance of Style Bias for Large-Cap Value Managers

	S&P 500 GROWTH OUTPERFORMS S&P 500 VALUE	S&P 500 VALUE OUTPERFORMS S&P 500 GROWTH	TOTAL
Most Value Managers Outperform	25	4	29
Most Value Managers Underperform	18	29	47
Total	43	33	76

Source: S&P Dow Jones Indices LLC. Data from Q1 2002 to Q4 2020. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

We can find similar style biases in other asset classes. In Exhibits 10 and 11, we examine the fixed income space. Most investment-grade bond managers outperformed in 45% (34/76) of all quarters, but they outperformed in 61% (33/54) of the quarters when the high-yield sector beat higher-quality bonds. Similarly, most high-yield managers outperformed only 18% (14/76) of the time; their likelihood of outperformance rose to 36% (8/22) if the high-yield sector underperformed. These observations suggest that investment-grade bond managers, as a group, have at least some high-yield exposure, and that high-yield managers, as a group, have at least some investment-grade exposure.

When value outperformed growth, the odds of active outperformance fell to 12%.

Exhibit 10: Importance of Style Bias for Investment-Grade Bond Funds

	S&P 500 HIGH YIELD CORPORATE BOND INDEX OUTPERFORMS S&P 500 INVESTMENT GRADE CORPORATE BOND INDEX	S&P INVESTMENT GRADE CORPORATE BOND INDEX OUTPERFORMS S&P 500 HIGH YIELD CORPORATE BOND INDEX	TOTAL
Most Investment-Grade Managers Outperform	33	1	34
Most Investment-Grade Managers Underperform	21	21	42
Total	54	22	76

Source: S&P Dow Jones Indices LLC. Data from Q1 2002 to Q4 2020. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

We can find similar style biases in other asset classes

¹⁰ Results are less pronounced for growth managers tilting towards value. Other studies show similar results; see Tanner, Glenn, William T. Chittenden, and Janet D. Payne, “[Style Drift among Value and Growth Funds](#),” *Journal of Investing*, October 2020. We also observe style tilts across countries (e.g., Canadian managers tend to outperform when U.S. equities beat Canadian equities).

Style biases help explain the likelihood of outperformance across active management specialties, in equity and fixed income markets.

Style biases provide insight into the prospective success of asset owners who hire active managers for their portfolios.

The power of style bias in explaining results, however, suggests that true active management skill is rare.

Exhibit 11: Importance of Style Bias for High-Yield Funds

	S&P HIGH YIELD CORPORATE BOND INDEX OUTPERFORMS S&P 500 INVESTMENT GRADE CORPORATE BOND INDEX	S&P 500 INVESTMENT GRADE CORPORATE BOND INDEX OUTPERFORMS S&P 500 HIGH YIELD CORPORATE BOND INDEX	TOTAL
Most High-Yield Managers Outperform	6	8	14
Most High-Yield Managers Underperform	48	14	62
Total	54	22	76

Source: S&P Dow Jones Indices LLC. Data from Q1 2002 to Q4 2020. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

FINAL THOUGHTS

Style biases help explain the likelihood of outperformance across a variety of active management specialties, in both equity and fixed income markets. They thus provide insight into the prospective success of asset owners who hire active managers for their portfolios. Suppose, for example, that large-cap stocks perform much better than mid-caps, which in turn perform much better than small-caps. History then suggests that most large-cap managers will underperform, while the odds of success are much better for mid- and small-cap managers.

Style biases are not determinative, of course—some active managers may be genuinely skilled at sector rotation or security selection, and those disciplines will have their own rewards. The power of style bias in explaining results, however, suggests that true active management skill is rare.

APPENDIX

The Role of Dispersion

If every stock in an index had the identical return, stock selection would be irrelevant; as the gap between winners and losers grows, the ability to distinguish one from the other becomes more valuable. Dispersion,¹¹ the index-weighted standard deviation of returns, gives us a convenient way to measure the potential value of stock selection ability.

Successful active managers have more opportunity to add value when dispersion is high than when it is low, since high dispersion implies a larger gap between winners and losers.¹² Of course, higher dispersion does not *guarantee* outperformance, as we saw during the first quarter of 2020, when most active managers underperformed despite very high dispersion.¹³

Since both dispersion and style bias can be drivers of active manager performance, it's natural to wonder about their relative importance. We addressed this question using the SPIVA database. For each quarter, we gathered three observations:

- The percentage of large-cap active managers underperforming the S&P 500;
- The dispersion of the S&P 500; and
- The spread between the performance of the S&P MidCap 400 and the S&P 500.

We divided the quarterly data into four quartiles based on active funds' performance. The top quartile comprised the quarters with the lowest percentage of underperforming managers, with the fourth quartile comprising the highest percentage of underperformers.

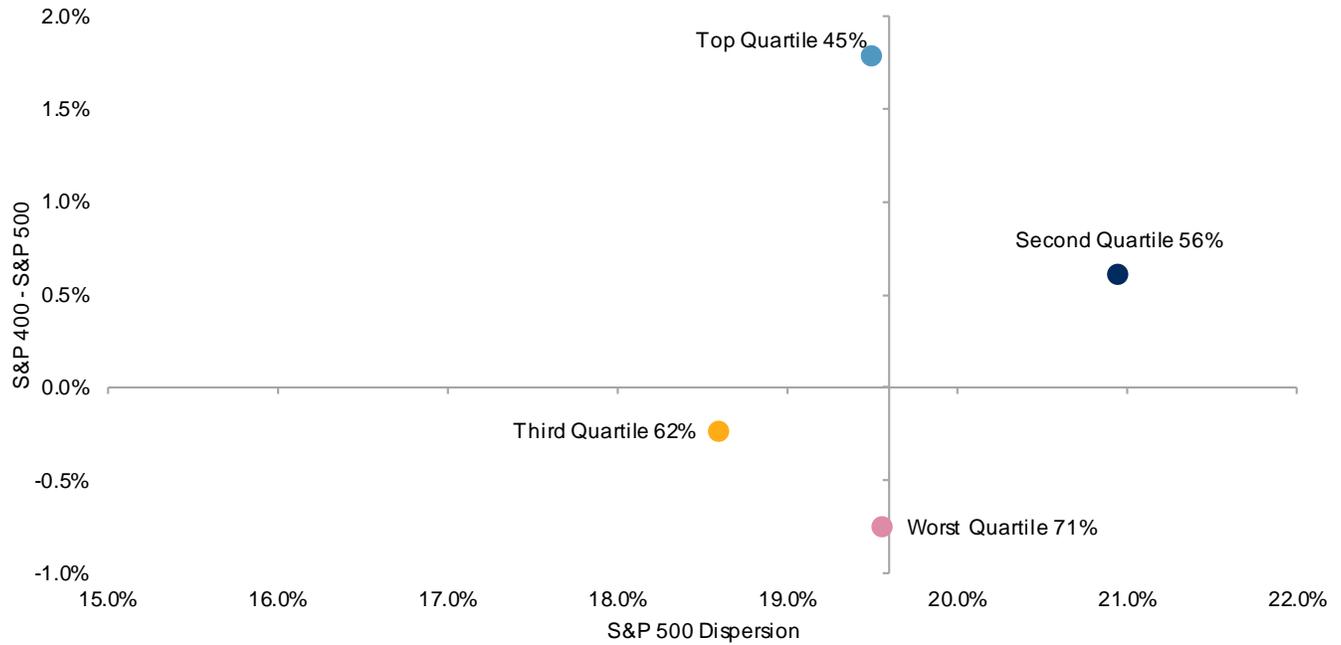
In Exhibit 12, we plot the median dispersion and median spread for each quartile, along with the percentage of underperforming managers. For the quarters in the top quartile, for example, 45% of managers underperformed; in the bottom quartile, 71% underperformed. The quartiles align monotonically in order of S&P 400 to S&P 500 spread, as the top and second quartiles occur when the S&P 400 outperformed, while the third and fourth quartiles occur when the S&P 400 underperformed. Meanwhile, dispersion appears to have had a negligible impact on large-cap manager performance.

¹¹ Edwards, Tim and Craig J. Lazzara, "[Dispersion: Measuring Market Opportunity](#)," S&P Dow Jones Indices, December 2013.

¹² Chan, Fei Mei and Craig J. Lazzara, "[Degrees of Difficulty: Indications of Active Success](#)," S&P Dow Jones Indices, May 2018. The same relationship also applies to factor indices; the differential performance of factors relative to the S&P 500 rises dramatically as dispersion increases. See Chan and Lazzara, "[Gauging Differential Returns](#)," S&P Dow Jones Indices, January 2014.

¹³ Liu, Berlinda, "[Active Managers: No Place to Hide](#)," S&P Dow Jones Indices, June 10, 2020.

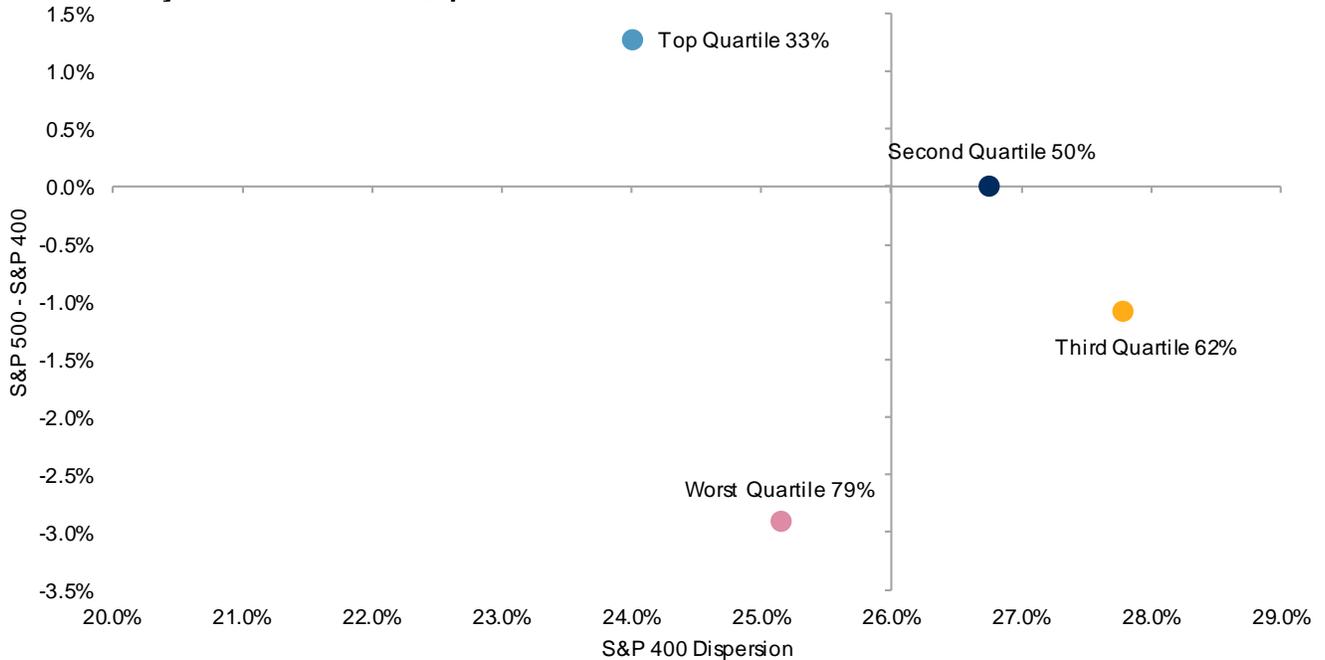
Exhibit 12: Style Bias Drives Large-Cap Performance



Source: S&P Dow Jones Indices LLC. Data from Q1 2002 to Q4 2020. Labels include the quartile category and median percentage of underperforming large-cap funds. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

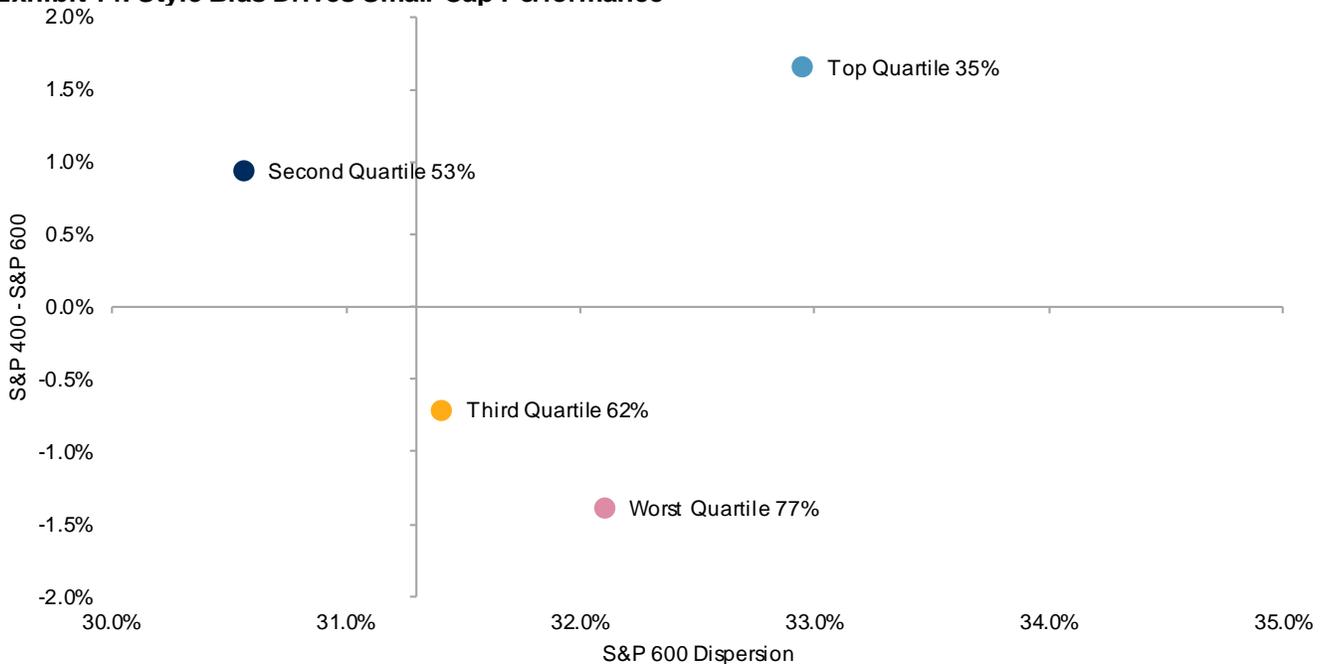
These results are not limited to large-cap managers. Comparable data for mid- and small-cap managers are plotted in Exhibits 13 and 14, respectively.

Exhibit 13: Style Bias Drives Mid-Cap Performance



Source: S&P Dow Jones Indices LLC. Data from Q1 2002 to Q4 2020. Labels include the quartile category and median percentage of underperforming mid-cap funds. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Exhibit 14: Style Bias Drives Small-Cap Performance



Source: S&P Dow Jones Indices LLC. Data from Q1 2002 to Q4 2020. Labels include the quartile category and median percentage of underperforming small-cap funds. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Across the cap range, **the impact of dispersion was surprisingly weak.** High dispersion was not associated with higher rates of manager outperformance. For small-cap managers, in fact, it may be perverse.

The key to this apparent conundrum is to understand that, for active managers, dispersion is a measure of *opportunity*. High dispersion means more opportunity to excel. But in high dispersion environments, the punishment for getting it wrong—choosing underperforming constituents—is higher than when the constituents’ returns are more clustered. Thus, the size of the opportunity tells us nothing about managers’ ability to take advantage of the opportunity. **The implication of Exhibits 12-14 is that active managers, as a group, do not exhibit stock selection ability.** In contrast, at least some managers may profit from the differential performance of capitalization tranches.

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INDEX INVESTMENT STRATEGY

For use with institutions only, not for use with retail investors

PERFORMANCE DISCLOSURE/BACK-TESTED DATA

The S&P 500 High Yield Corporate Bond Index and S&P 500 Investment Grade Corporate Bond Index were launched July 8, 2015. All information presented prior to an index's Launch Date is hypothetical (back-tested), not actual performance. The back-test calculations are based on the same methodology that was in effect on the index Launch Date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. Complete index methodology details are available at www.spglobal.com/spdji. Past performance of the Index is not an indication of future results. Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. Past performance is not an indication or guarantee of future results. Please refer to the methodology for the Index for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations. Back-tested performance is for use with institutions only; not for use with retail investors.

S&P Dow Jones Indices defines various dates to assist our clients in providing transparency. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the index is set to a fixed value for calculation purposes. The Launch Date designates the date when the values of an index are first considered live: index values provided for any date or time period prior to the index's Launch Date are considered back-tested. S&P Dow Jones Indices defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company's public website or its data feed to external parties. For Dow Jones-branded indices introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed "Date of introduction") is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index's public release date.

Typically, when S&P DJI creates back-tested index data, S&P DJI uses actual historical constituent-level data (e.g., historical price, market capitalization, and corporate action data) in its calculations. As ESG investing is still in early stages of development, certain datapoints used to calculate S&P DJI's ESG indices may not be available for the entire desired period of back-tested history. The same data availability issue could be true for other indices as well. In cases when actual data is not available for all relevant historical periods, S&P DJI may employ a process of using "Backward Data Assumption" (or pulling back) of ESG data for the calculation of back-tested historical performance. "Backward Data Assumption" is a process that applies the earliest actual live data point available for an index constituent company to all prior historical instances in the index performance. For example, Backward Data Assumption inherently assumes that companies currently not involved in a specific business activity (also known as "product involvement") were never involved historically and similarly also assumes that companies currently involved in a specific business activity were involved historically too. The Backward Data Assumption allows the hypothetical back-test to be extended over more historical years than would be feasible using only actual data. For more information on "Backward Data Assumption" please refer to the [FAQ](#). The methodology and factsheets of any index that employs backward assumption in the back-tested history will explicitly state so. The methodology will include an Appendix with a table setting forth the specific data points and relevant time period for which backward projected data was used.

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GENERAL DISCLAIMER

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