Concentrated Equity: Practice Versus Premise

October 2024

- Concentrated equity strategies have attracted attention from asset owners looking for "high conviction" active investments.

- But in an empirical analysis of a broad set of concentrated strategies, we find no evidence that, in practice, they outperform as a group.

- We also highlight challenges that investors who allocate to concentrated strategies may face when they assume the task of diversification from external managers.

Concentrated equity strategies have drawn considerable interest from institutional investors, for several recent years representing an elevated fraction of strategies introduced into the long-only universe (Figure 1). For asset owners under pressure to meet high absolute returns targets and frustrated with active fees charged for closet indexing, the premise of investing with stock pickers who focus on a limited set of "high conviction" holdings has intuitive appeal as well as support from academic literature on the performance of mutual fund managers' largest active positions.[1] But does the approach work in practice?

In this paper, we examine whether concentrated strategies have lived up to expectations. To do so, we analyze a large sample of active long-only U.S. equity strategies from 2013-2023. We find no evidence that concentrated strategies, as a group, produce higher active returns or alpha than higher-breadth strategies. Moreover, we document how noise in concentrated strategies' returns creates dispersion in measured risk characteristics that blurs performance analysis and reduces visibility regarding future behavior.

These results show that while discretionary stock picking ability surely exists among institutional managers, concentration is not any easy solution for investors looking to boost active performance. The results also highlight practical challenges facing asset owners who choose to internalize the task of crafting and risk managing a portfolio of concentrated external managers rather than allocating to diversified strategies. Such challenges often go unrecognized in studies of concentration.

Figure 1: Growth of Concentrated Equity Strategies

Fraction of U.S. long-only equity strategies incepted per year that have 25 or fewer holdings
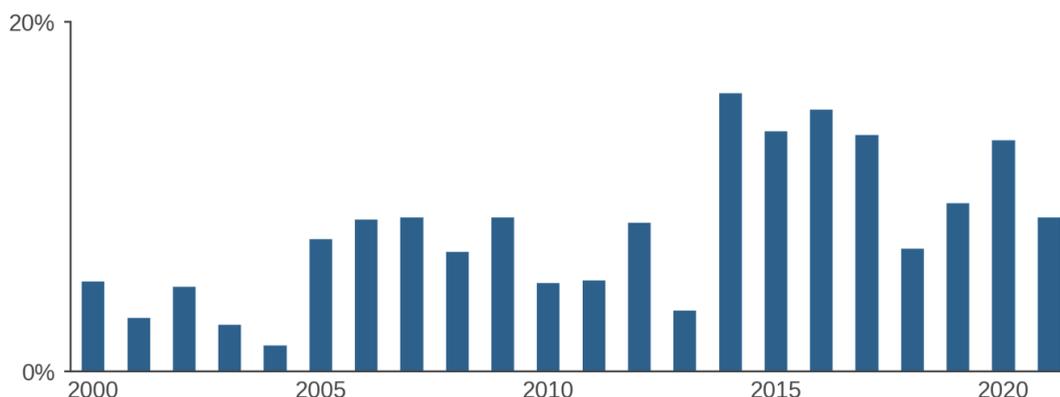
Among strategies incepted in eVestment's U.S. long-only universe each year, chart shows the fraction with 25 or fewer holdings. Data sample described in the Appendix. Source: Acadian based on data from eVestment®. See eVestment Disclosure at end of the document.

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[1] Seminal academic literature includes: On managers' best ideas—Anton, Cohen, and Polk (2021, prior version 2009) and Baks, Busse, and Green, (2006); on active share (and its relationship to concentration) —Cremers and Petajisto (2009), Schlanger, Philips, and Peterson LaBarge (2012), Frazzini, Friedman, and Pomorski (2016); on industry and country concentration—Kacperczyk, Sialm, and Zheng (2005) and Choi, Skiba, and Sokolyk (2017); on the influence of skill over the decision to concentrate—Brown, Tiu, Yoeli (2020) and Fulkerson Riley (2019).

For a contemporary and provocative behavioral critique of concentrated investments, see a series of August-September 2024 blogposts from Owen Lamont: Buffett's Bad Advice, Invest Like the Worst: Wealth-Destroying Portfolio Concentration, and Goodhart's Law of Active Management, Acadian, 2024.

The Premise of Concentration

Performance of concentrated strategies could easily draw attention from ambitious investors. Sorting all offerings in eVestments's long-only U.S. equity universe by their average active returns, strategies with the most concentrated portfolios represent a disproportionate fraction of the best performers. For example, 17% of top-decile active returns come from the 10% of strategies with the narrowest portfolios. In other words, investors scanning track records for exceptional performance are inordinately likely to find it produced by concentrated managers.

But that does not necessarily mean that concentrated managers possess superior skill. The narrowest decile of portfolios also represents a disproportionate fraction of the *worst* performers, 20%. The explanation is intuitive. Concentrated strategies deliberately forgo diversification, and, therefore, display higher levels of active risk. As a result, they are disproportionately represented in the negative tail of the active returns distribution, not just in the positive one. While the upside of returns dispersion is tantalizing, Figure 2 drives home the downside of confusing it with skill—risk of larger active drawdowns.

Nevertheless, it would be simplistic to dismiss concentrated strategies because they individually exhibit higher active risk, which pulls down their individual Information Ratios (IRs). Many asset owners embrace this characteristic, viewing the lack of diversification in any single concentrated strategy as a desirable feature rather than a bug. This view rests on the belief that active managers should focus on what is ostensibly their value-adding skill, stock picking, and that bandwidth-constrained discretionary managers are best off narrowing their focuses to their highest-conviction "best ideas." The asset owner then assumes the task of diversification by holding a portfolio of concentrated strategies, which reduces the elevated active risk thrown off by any single one. (Similar to the rationale for a multi-pod hedge fund.[2]) Doing so also removes the stock-picker's incentive to stuff portfolios with index-like positions just to soak up AUM. The intent is that the *portfolio* of concentrated strategies will have a higher IR than a diversified strategy.

While the intuition makes sense (at least in the context of discretionary stock picking—see the inset for systematic perspective, which differs greatly), it is not clear whether asset owners accrue benefits in practice. Two questions warrant empirical analysis:

- First, does the performance of concentrated strategies manifest greater skill? I.e., do they exhibit superior active returns and/or alpha?

- Second, do concentrated strategies exhibit characteristics that exacerbate challenges for asset owners with respect to manager selection, portfolio composition, and performance attribution?

Figure 2: Active Drawdowns by Number of Holdings—U.S. Long-Only Equity Strategies

Average maximum drawdown over rolling 36-month windows
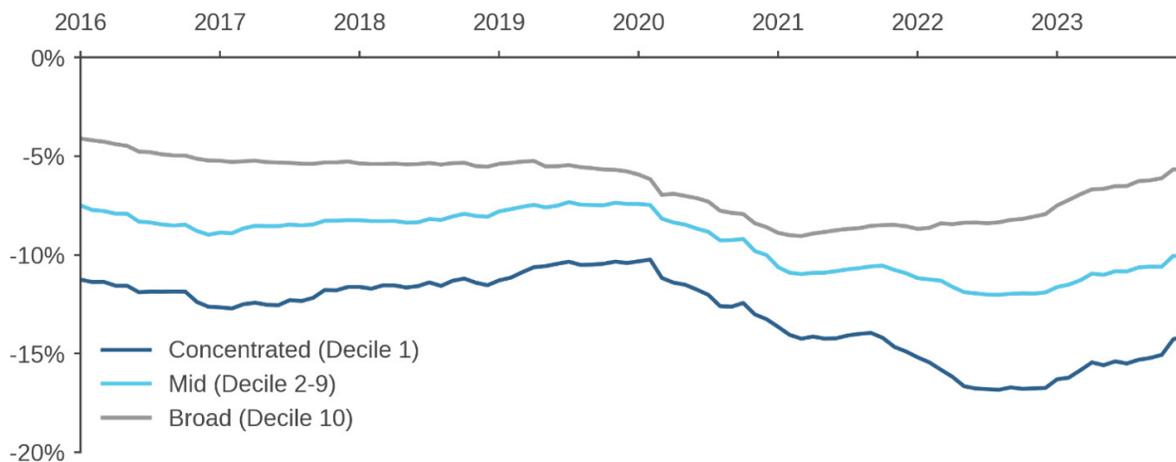
Average maximum active drawdown in each holdings category over rolling 36-month periods based on cumulative (summed) active returns relative to manager's preferred benchmark. For each observation, calculation only includes strategies that have excess returns data for the entire 36-month window. Concentrated, Mid, and Broad strategies reflect portfolios in the 1st, 2nd-9th, and 10th deciles of average number of holdings, respectively. Data sample as described in Appendix. Source: Acadian based on data from eVestment®. See eVestment Disclosure at end of the document. Past performance is no guarantee of future returns. For illustrative purposes only.

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[2] See Acadian, The Systematic Multi-Strategy Hedge Fund: A Better Alternative?, August 2024.

Conviction and Concentration: How Systematic Approaches Relate

The premise of investing in concentrated strategies reflects a belief that a smaller number of holdings in an active manager's portfolio indicates higher conviction in the positions held, i.e., the portfolio reflects the manager's best ideas. As we discussed in research many years ago, this notion is predicated on the investment process being labor-intensive, meaning that it does not scale well. The classic example would be an individual PM, or small pod, who picks stocks based on traditional modes of analysis and exercises discretionary judgment over security selection and timing, portfolio construction, and risk management. In such a context, the PM can only closely follow and form strong opinions about a limited set of companies. Covering and managing positions in hundreds of companies with consistent depth would require assembling armies of analysts and PMs, which would dilute skill and introduce analytical inconsistencies. As a result, managers are better off restricting their portfolios to a few names where they have the strongest views and leaving diversification to the asset owner.

But this intuition does not apply to systematic investing. Systematic processes are designed to scale across broad investment universes by making use of algorithmic analysis, forecasting, and portfolio construction.

Moreover, the goal of a systematic process is typically to form a portfolio with optimal exposure to stock characteristics that predict future returns. In that context, conviction applies to the intensity and purity of the exposures. The number of stockholdings becomes a means to that end, a byproduct of systematic portfolio construction through which expected alpha is maximized relative to risk and transaction costs. As we demonstrated in past research (Conviction, Concentration, and Quant (2015)), limiting the number of holdings in that process would have costs in terms of lower expected alpha after and/or greater risk exposures, in effect reducing conviction.

The Landscape of Concentrated Strategies

Before presenting results from empirical analysis of these two questions, we first outline the dataset that we study and highlight relevant characteristics of concentrated strategies found there.

Our analysis focuses on a large sample of long-only U.S. equity strategies from eVestment®, an industry-standard database used by institutional asset owners and consultants, over the period from 2013-2023. We impose several filters to ensure data consistency, e.g., we limit the sample to strategies that report gross-of-fee, USD returns. So that we can distinguish a deliberate decision to concentrate from an inherently narrow investing context, we only include strategies whose manager selects a recognizable broad-market index as the benchmark (acknowledging that this eliminates sector strategies where managers may have focused domain expertise). The resulting dataset provides a substantial panel of data for empirical study, containing 2,839 unique strategies. it includes strategies that were incepted and that became inactive during the sample period. The Appendix provides further details of the dataset's specification.

We measure concentration as the number of holdings in the portfolio. Two aspects of the data speak to the relevance of this metric for testing whether concentrated strategies live up to the "best ideas" premise. First, there is meaningful variation in the number of holdings over the cross section of strategies, as shown in Table 1. The typical portfolio in decile 1, which we will label throughout as "concentrated," contains only 25 stocks, whereas the typical portfolio in the highest breadth decile, 10, contains 300. Second, the names of the narrowest strategies show clear intent to market the products as concentrated. In the smallest holdings decile fully 42.7% of the names include keywords that are obviously semantically related to the

concept of concentration, including "Concentrate," "Focus," "Select," "Best," and "Conviction." Such terms are rarely found elsewhere in the sample.[3]

Within this dataset, concentrated strategies differ from others in terms of several characteristics that are relevant to analysis of their performance and to allocators' decisions. For example, concentrated strategies tend to be newer, as hinted at in Figure 1, meaning that they are better represented in the more recent part of the sample. They also have smaller AUM. Table 1 shows that in the most concentrated decile, 42% have assets below $100M, a threshold commonly associated with relevance for institutional allocations, versus only 18% in the highest-breadth decile.

Concentrated strategies also differ in terms of two key style characteristics. First, the left panel of Figure 3 shows that concentrated strategies are more likely to declare a growth or value focus than broader strategies. That makes sense, as a form of specialization that narrows the manager's coverage universe.

Second, concentrated strategies tend to hold larger stocks. The right panel of Figure 3 shows that concentrated strategies tend to self-identify as larger cap, while higher-breadth strategies tend to self-identify as small cap.[4] This might reflect natural limits to concentration in small caps: a manager with a narrow scope might reasonably opt to focus on larger caps to allow for greater capacity. In contrast, higher-breadth strategies have a natural tendency to tilt away from the largest stocks in cap-weighted indexes. Mechanically that makes sense, in that there are only so many large-cap names available for investment; so, portfolios with large numbers of holdings might naturally own smaller stocks. But there is also a compelling logic to the small-cap lean among active managers with sufficiently scalable investment processes: the smaller-cap space is less-efficiently priced.[5]

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[3] 22.6% in the second, 5.5% in the 5th, and 1.8% in the 10th. The highest-breadth deciles contain many more strategies that self-identify as "quantitative," reaching a small majority in decile 10.

[4] Market cap risk factor loadings also show that concentrated strategies lean relatively large even within small-cap and large-cap capitalization categories. See Figure 9, for example.

[5] For further discussion, see Thinking Broadly: Improving Active Performance Via Systematic Extensions, Acadian, October 2023.

Table 1: Strategy Characteristics by Holdings Decile

Based on data from 2013-2023

					Holdings Decile					
	Concentrated	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**High-Breadth**
Number of Strategies	204	190	188	189	189	191	187	189	188	190
Median Holdings	25	34	42	49	58	70	82	100	135	301
% AUM < 10M	18%	11%	12%	11%	8%	7%	8%	6%	9%	5%
% AUM < 100M	42%	30%	32%	30%	28%	23%	24%	20%	22%	18%
% AUM > 1B	23%	30%	32%	30%	37%	41%	40%	45%	47%	44%
% Quantitative	4%	3%	2%	5%	4%	5%	11%	22%	36%	54%

Table displays sample characteristics based on sorting all strategies into holdings deciles each month and averaging sample characteristics of those holdings deciles over time based on strategies for which there is an excess return on the given date. Data sample as described in Appendix. Source: Acadian based on data from eVestment®. See eVestment Disclosure at end of the document.

Figure 3: Style Characteristics as a Function of Portfolio Concentration

Styles as identified in eVestment®; based on data from 2013-2023; concentrated versus high-breadth strategies (holdings decile 1 versus 10)
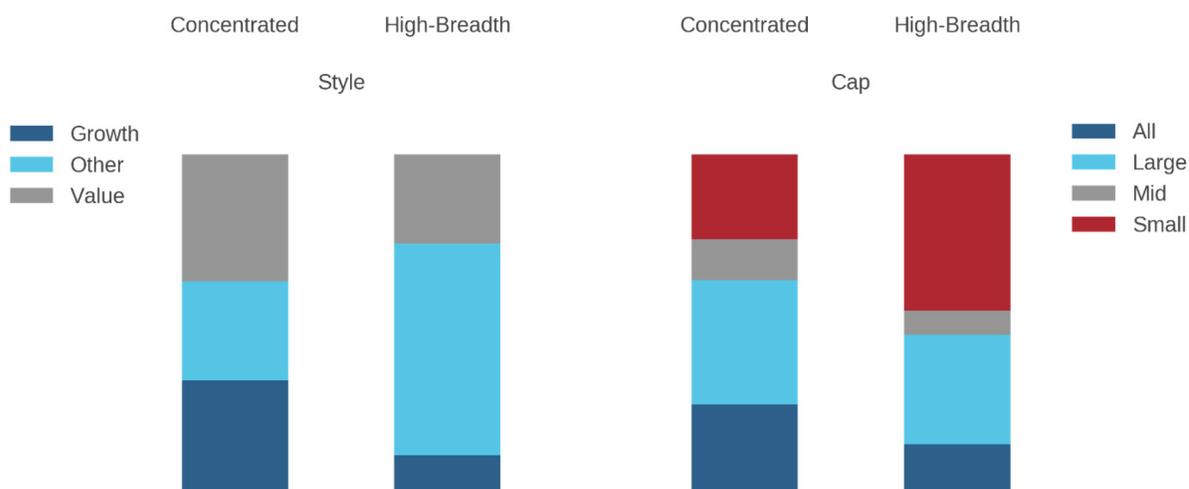
Style characteristics defined based on manager's classification. Data sample as described in Appendix. Source: Acadian based on data from eVestment®. See eVestment Disclosure at end of the document.

Concentration in Practice: No Evidence of Outperformance

Empirical analysis of our dataset does not support the hypothesis that concentrated strategies outperform.

As a first test, Figure 4 shows that from 2013-2023, average active returns of the most highly concentrated strategies, in decile 1 at left, were relatively poor compared to broader holdings deciles. In other words, concentration is not associated with outperformance after controlling for cap and style attributes based on the manager's own characterization, i.e., measuring active returns relative to the manager's preferred benchmark.

Figure 4: Average Annualized Active Returns by Holdings Decile

Versus manager's preferred benchmark; based on data from 2013-2023
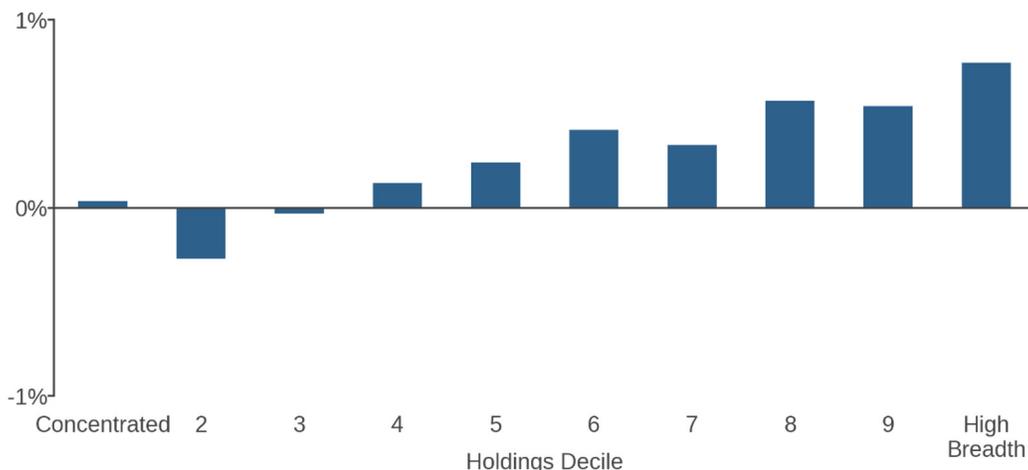
Active returns are measured relative to the Primary Benchmark recorded in eVestment. The performance information presented here is gross of fees. Strategies are sorted into holdings deciles each month, and excess returns within those holdings deciles are then averaged over time. Data sample as described in Appendix. Source: Acadian based on data from eVestment. See eVestment Disclosure at end of the document. Every investment program has an opportunity for loss as well as profit. Past performance is no guarantee of future returns. For illustrative purposes only.

Figure 5 unpacks the baseline result, charting three-year rolling active returns over time as well as across cap and style categories.[6] The results show comparative outperformance in the most concentrated decile only in the late teens and through mid-2021, a modest but interesting subset of the sample period. Those years, as we've discussed in prior research, were marked by growthy speculation in the U.S. stock market: To a historically unusual degree, cap-weighted returns were driven by multiple expansion rather than fundamentals, with evidence of a bubble emerging at the end of the period.[7] The observation that concentrated strategies outperformed during this episode, and stumbled as speculative excess unwound in the growth-led selloff of 2022, raises the question as to whether concentrated managers of various stripes joined in similar speculative pursuits. Outperformance during this period may have resulted from a transient style trend rather than superior stock-picking ability.[8]

While the active returns analyzed in Figures 4 and 5 reflect whether managers have met their own chosen performance objectives, they do not directly measure stock-picking skill. As one such measure, we can decompose each active strategy's expected excess return as follows:

Contributions from:

Strategy Expected Return	=	Stock-Selection Alpha	+	Benchmark Exposure (may be <> 1)	+	Benchmark-Relative Factor Tilts

The intent is to distinguish stock-selection ability from the portfolio's lean into or away from its benchmark as well as benchmark-relative (generic) factor tilts. In empirical analysis based on this intuition, we control for the four Fama-French-Carhart factors that are ubiquitous in academic asset pricing literature—the cap-weighted market excess return, value (high-low B/P), size (small-minus-big), and momentum (winners-minus-losers). As we show in the Appendix, stock-selection alpha for an active strategy (*P*) then becomes is its Fama-French-Carhart four-factor alpha net of four-factor alphas attributable to its benchmark (*B*):[9]

$$\alpha_{StockSel}^{P} = \alpha_{4factor}^{P} - \beta_{B}^{P} * \alpha_{4factor}^{B}$$

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[6] Frazzini, Friedman, and Pomorski's incisive 2016 critique of prior claims that active share predicts mutual fund performance highlights the importance of controlling for benchmark performance in studies of return predictability across heterogeneous active equity strategies.

[7] E.g., see Owenomics: Getting Bubbly, Acadian, July 2024 and the research paper Growth Versus Value: End of an Era?, Acadian, November 2022.

[8] In a study of U.S. equity mutual funds, Yeung et al (2012) found that periods of outperformance of hypothetical concentrated portfolios formed from the largest active positions "… are confined largely to periods when the market was performing well." They theorize that this is the result of a tilt towards small-cap, positive-momentum stocks.

[9] The Appendix also details how this definition of stock-selection alpha relates to active returns.

Figure 5: Active Returns Versus Manager's Preferred Benchmark

Annualized 36M moving averages (for all strategies that survive the trailing 36M window)
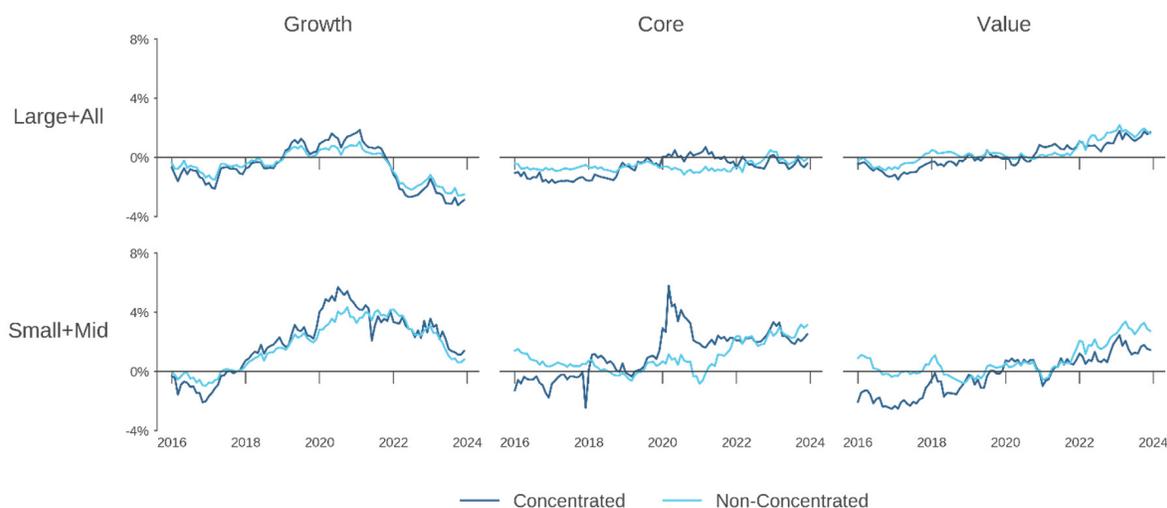
Active returns are measured relative to the Primary Benchmark recorded in eVestment. The performance information presented here is gross of fees. Strategies are sorted into holdings deciles each month, and excess returns within those holdings deciles are then averaged over time. Large cap combines Large and All-Cap eVestment categories; Small cap combines Small and Midcap. For each monthly observation, data reflects strategies with active returns available for the full trailing 36-month window. Data sample as described in Appendix. Source: Acadian based on data from eVestment. See eVestment Disclosure at end of the document. investment program has an opportunity for loss as well as profit. Past performance is no guarantee of future returns. For illustrative purposes only.

In the main empirical specification, we estimate benchmark and factor exposures using whatever data is available for a given strategy over the full sample period.[10] The results of this alternative analysis, presented in the Appendix (Figure A1), also provide no evidence of superior stock selection in concentrated strategies as a group. Across holdings deciles, the relative pattern in stock-selection alphas resembles that seen in Figure 4 for active returns, although concentrated strategies do fare somewhat better. Examining the data over time, the results echo the pattern observed in Figure 5. Concentrated strategies' monthly abnormal returns (adjusted for benchmark and four-factor exposures) materially exceed those of other strategies largely during the period of growthy speculation and are lower during other periods.[11]

The lack of evidence favoring concentrated managers is robust to several variations in the above analyses. For example, we find qualitatively similar results if we restrict the sample to separate accounts; among strategies with institutionally relevant AUM (> $100MM); if we estimate exposures to risk factors associated with a commercial risk model rather than to the academically prevalent Fama-French portfolios; if we measure concentrated strategies' incremental performance relative to strategies in holdings deciles 2-8 (where discretionary investing approaches predominate) rather than the full sample[12]; and if we re-estimate strategy risk factor exposures over rolling three-year windows rather than once over the full sample.

Practice: Complications for Asset Owners

As highlighted at the outset of the paper, the noisiness of concentrated strategies' returns raises the stakes in distinguishing skill from luck, since it increases the likelihood of exceptional performance that results from chance. The source of noise that probably first comes to mind would be idiosyncratic risk associated with a deliberately chunky stockholding, but returns dispersion could also arise from inadvertent exposures to risk factors and returns premia (whether positive or negative). That would hardly be surprising in a class of strategies typified by heuristic portfolio construction methods; risk and alpha factor exposures may go unmeasured and unmanaged.

Figure 6 empirically validates the concern based on the same dataset that we used to test performance. The chart shows that in the narrowest holdings decile there is much greater dispersion in estimated risk factor exposures (relative to the manager's preferred benchmark) than in the broadest holdings decile.

While greater dispersion in risk exposures could reflect intent, i.e., that concentrated managers are deliberately taking more disparate style bets, Figure 7 suggests otherwise. The scatterchart shows dispersion in an attribute that we would expect managers to target. It compares estimated loadings on a size risk factor among large-cap, mid-cap, and small-cap strategies—indicated by

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[10] For inclusion in the analysis, we require strategies to have at least 36 months of excess returns.

[11] Viewed in isolation, analysis based on this definition of stock-selection alpha might underestimate the relative skill of concentrated managers if 1) they (intentionally) rely on market or factor timing as a source of alpha to a greater degree than higher-breadth managers or 2) the generic factor loadings that we estimate ex post are a major source of the value generated through their active stock positions. For discussion of risks of misattributing performance in the context of ex post factor analysis, see Generic Exposures: Not All Gold Glitters!, Acadian, September 2024.

[12] Brown et al (2020) use a similar robustness check in their analysis of the impact of past performance on the decision to concentrate, adding an analysis where they limit their sample to mutual funds holding fewer than 500 stocks.

red, green, and blue dots, respectively—as a function of portfolio breadth. Among concentrated strategies, to the left, the estimated size exposures become dispersed to such a degree where distinctions between small, mid, and large-cap strategies smear. In other words, even over long holding periods, large-cap concentrated strategies may *behave like* small-cap portfolios (and vice versa), whereas the behavior of higher-breadth portfolios more reliably resembles their (presumably) targeted style characteristics.

Figure 6: Cross-Sectional Standard Deviation of Estimated Active Factor Loadings

Based on monthly returns data from 2013-2023; concentrated versus high-breadth strategies (holdings decile 1 versus 10)
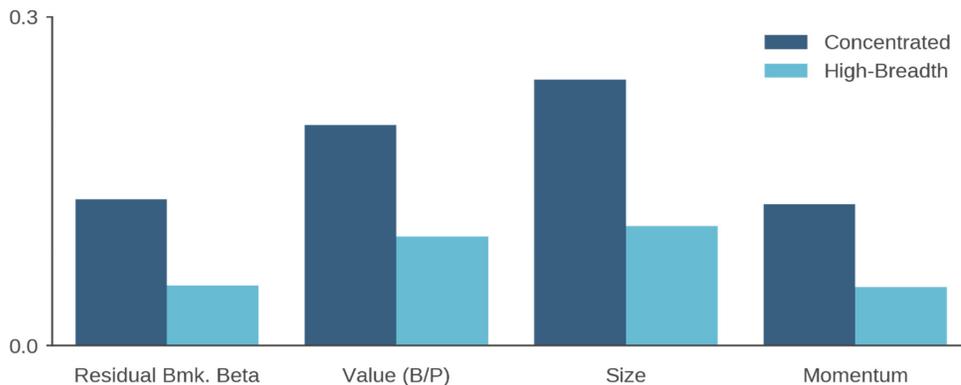
Factor exposures estimated via in-sample multifactor regressions of excess strategy returns on benchmark excess returns as well as value, size, and momentum factor returns over the period from 2013 to 2023 for all strategies with returns throughout the entire period. Concentrated and high-breadth samples consist of strategies in holdings deciles 1 and 10, respectively. Data sample described in Appendix. Source: Acadian based on strategy and benchmark data sourced from eVestment® and factor returns from the Ken French Data Library. Data from Ken French Data Library: Copyright © 2024, Kenneth R. French. All rights reserved. See eVestment Disclosure at end of the document. Past performance is no guarantee of future returns. For illustrative purposes only.

Figure 7: Estimated Size Exposures for Large-Cap, Mid-Cap, and Small-Cap Strategies as a Function of Number of Holdings
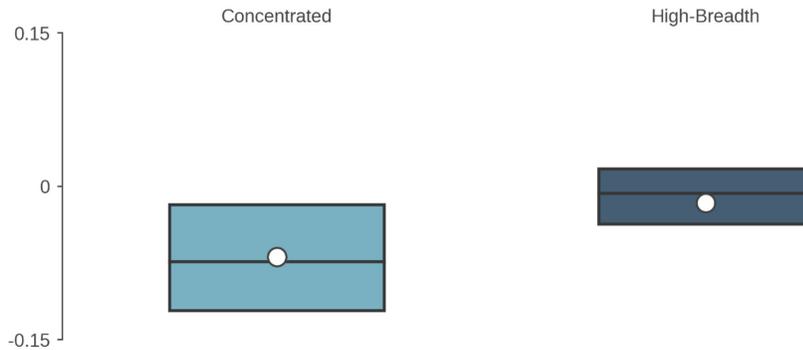
Based on monthly returns data from 2013-2023
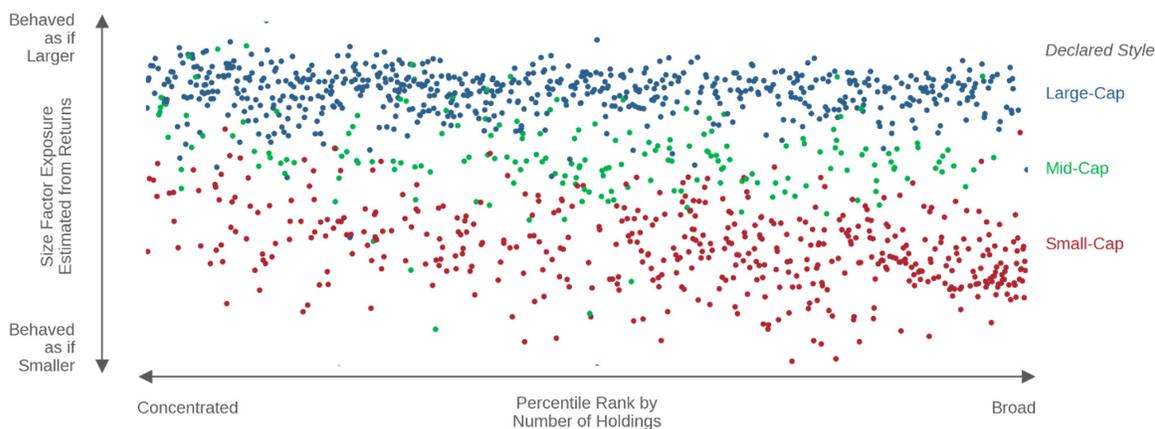
Small-Minus-Big (SMB) factor exposure estimated via in-sample multifactor regressions that include the four Fama-French-Carhart factors over the period from 2013 to 2023 for all strategies with returns throughout the entire period. Data sample described in Appendix. Source: Acadian based on strategy and benchmark data sourced from eVestment® and factor returns from the Ken French Data Library. Data from Ken French Data Library: Copyright © 2024, Kenneth R. French. All rights reserved. See eVestment Disclosure at end of the document. Past performance is no guarantee of future returns. For illustrative purposes only.

Figure 8: Estimated Momentum Exposures of Value Strategies

Based on monthly returns data from 2013-2023; concentrated versus high-breadth strategies (holdings decile 1 versus 10)

Momentum (Winners-Losers) factor exposure estimated via in-sample multifactor regressions that include the four Fama-French-Carhart factors over the period from 2013 to 2023 for all strategies with returns throughout the entire period. Data sample described in Appendix. Source: Acadian based on strategy and benchmark data sourced from eVestment® and factor returns from the Ken French Data Library. Data from Ken French Data Library: Copyright © 2024, Kenneth R. French. All rights reserved. See eVestment Disclosure at end of the document. Past performance is no guarantee of future returns. For illustrative purposes only.

Moreover, Figure 8 presents evidence that concentrated strategies may wander into suboptimal exposures to systematic alpha drivers. The boxplots compare the distributions of momentum exposures for strategies declared by their managers as value oriented. In contrast to the high-breadth decile, where the estimated momentum exposures are tightly distributed near zero, in the most concentrated quintile, we see considerably greater cross-sectional dispersion as well as a noticeable negative bias. Such momentum dispersion and bias may reflect myopic value implementations that pile into stocks where prices have declined relative to fundamentals, neglecting the impact of negative sentiment on the outlook for returns.

Conclusion

Concentrated equity strategies represent a deceptively simple solution for investors who are in search of exceptional skill. Although we believe that there are discretionary stock pickers who possess superior selection and timing ability, our results highlight that such skill is not readily apparent among concentrated institutional equity strategies, taken as a group. Moreover,

to the extent that product purveyors have launched "focused" strategies to capitalize on the concentration trend, skill in the domain will become even harder to distinguish from copycat approaches.

In summary, asset owners who choose to invest in concentrated strategies should not underestimate the associated challenges. In addition to complications in manager selection, the blurriness of the behavior of concentrated portfolios adds to the difficulty of constructing portfolios of such strategies and risk managing them over time. For asset owners, therefore, taking on the task of diversification from external managers may be easier said than done.

When it comes to concentration, practice may not live up to premise.

Appendix

THE DATASET

Strategies, holdings, AUM, and performance data come from eVestment's U.S. long-only universe. Strategies must report gross-of-fee returns in USD. We impose filters on benchmarks, universes, styles, and product names to remove strategies that may have a specialization that could muddle the interpretation of number of holdings as a deliberate decision to concentrate relative to the relevant parent universe or reduce comparability of performance statistics. Specifically, we exclude:

- eVestment® Primary Universes associated with enhanced indexes, extended indexes, REITS, Microcaps, and Sectors.

- Preferred Style Emphases associated with long-short, REITs, and enhanced indexes.

- Products with names that include "Vol," "Micro," and "ADR."

- Certain missing data items.

We only include strategies that are benchmarked to certain common index families (Dow, CRSP, MSCI, NASDAQ, Russell, S&P, Wilshire). We exclude strategies with missing benchmarks or benchmarks that appear fewer than 2 times in the sample.

We fill forward holdings and AUM data from a quarterly to monthly frequency, in the process filling intervals of missing data (but the analysis does not use extrapolations past the last available datapoint).

We exclude Acadian strategies.

STOCK-SELECTION ALPHA ANALYSIS

As discussed in the main text, we can decompose the expected excess return of a strategy P with benchmark B into contributions from the following components:

Stock-selection alpha (operationally defined)   Benchmark exposure (may be <> 1)   Benchmark-relative factor tilts

$$E(P) = \alpha_{StockSel}^{P} + \beta_{B}^{P} * E(B) + \sum_{i=1}^{4}\left(\beta_{f_i}^{P} - \beta_{B}^{P} * \beta_{f_i}^{B}\right) * E(f_i) \tag{1}$$

where β_{B}^{P} represents strategy P's exposure to its benchmark. Each f_i represents one of the four Fama-French-Carhart factors, and $\beta_{f_i}^{P}$ and $\beta_{f_i}^{B}$ represent strategy and benchmark exposures to each factor based on:

$$E(P) = \alpha_{4factor}^{P} + \sum_{i=1}^{4}\beta_{f_i}^{P} * E(f_i) \tag{2}$$

and

$$E(B) = \alpha_{4factor}^{B} + \sum_{i=1}^{4}\beta_{f_i}^{B} * E(f_i) \tag{3}$$

Using (2) and (3), we can re-express (1) as:

$$E(P) = \alpha_{StockSel}^{P} + \beta_{B}^{P} * E(B) + \left(E(P) - \alpha_{4factor}^{P}\right) - \beta_{B}^{P} * \left(E(B) - \alpha_{4factor}^{B}\right) \tag{4}$$

Rearranging gives:

$$\alpha_{StockSel}^{P} = \alpha_{4factor}^{P} - \beta_{B}^{P} * \alpha_{4factor}^{B} \tag{5}$$

Figure A1 shows results from empirical analysis based on this definition of $\alpha_{StockSel}^{P}$. The left panel shows stock-selection alphas aggregated by holdings decile calculated consistently with (5). We first estimate the Fama-French-Carhart exposures for each strategy and its benchmark and then estimate the strategy's exposure to the benchmark consistent with those four-factor exposures (and the associated benchmark alpha).[13]

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[13] The decomposition in (1) is silent as to where to assign shared sources of excess return reflected in both the benchmark and the Fama-French-Carhart factors. Empirically, there is likely to be severe multicollinearity between conventional benchmarks and the market factor. An intuitive solution is to give benchmark exposure primacy over (residual) benchmark-relative factor tilts in the attribution of contributions to expected returns, i.e., to orthogonalize the Fama-French-Carhart factors against the benchmark. For estimation of $\alpha_{StockSel}^{P}$, however, the apportionment is irrelevant.

The pattern in average stock-selection alphas across holdings deciles in the left chart resembles the pattern in average active returns evident in Figure 4. By this measure, too, concentrated managers do not manifest superior skill. The right chart unpacks this data over time. It shows how the difference between monthly abnormal returns for concentrated strategies and the rest of the sample has evolved. We calculate abnormal returns for each strategy based on equation (1), i.e., adjusting each strategy's monthly excess return for contributions from estimated benchmark and benchmark-relative Fama-French-Carhart exposures. Similar to the charts in Figure 5 that are based on active returns, we only see sustained outperformance by concentrated strategies in the speculatively charged environment of the late teens through late 2021. And, as is evident in the left panel, the average difference over time is negative.

Figure A1: Estimated Stock-Selection Alpha Based on the Decomposition in Equation 1

Based on data from 2013-2023
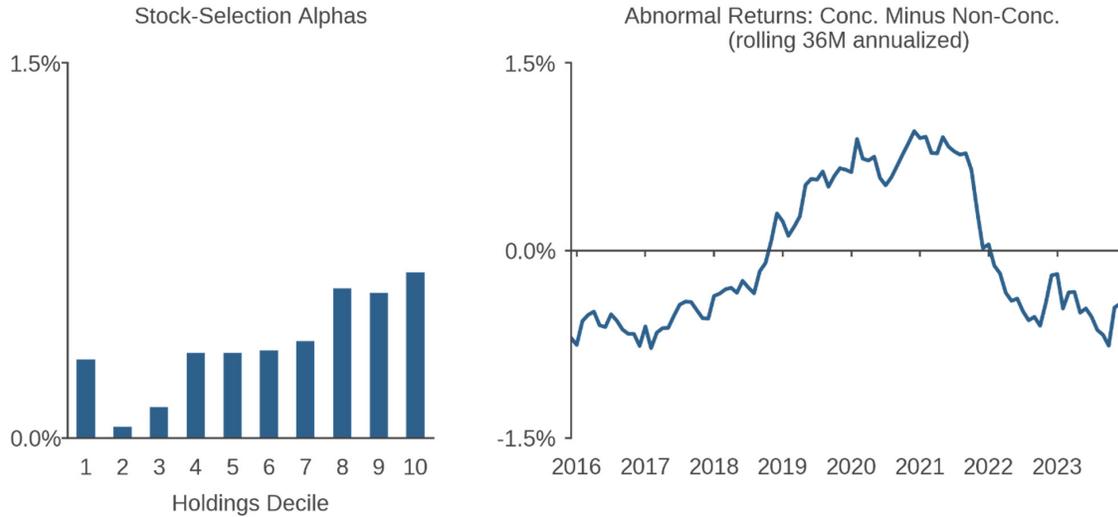
Left chart shows average estimated stock-selection alpha by holdings decile as described in the text. Right chart shows the difference in rolling 36-month average annualized abnormal returns between deciles 1 and deciles 2-10 also as described in the text. Strategies are assigned to holdings deciles each month. Source: Acadian based on strategy and benchmark data sourced from eVestment® and factor returns from the Ken French Data Library. Data from Ken French Data Library: Copyright © 2024, Kenneth R. French. All rights reserved. See eVestment Disclosure at end of the document. The performance information presented here is gross of fees. Every investment program has an opportunity for loss as well as profit. Past performance is no guarantee of future returns. For illustrative purposes only.

To close the loop between active returns and the foregoing definition of stock-selection alpha, we can use (2) and (3) to re-express a strategy *P*'s expected active returns as follows:

$$E(P) - E(B) = \left(\alpha_{4factor}^{P} - \alpha_{4factor}^{B} \right) + \sum_{i=1}^{4} \left(\beta_{f_i}^{P} - \beta_{f_i}^{B} \right) * E(f_i) \qquad (6)$$

Substituting in for $\alpha_{4factor}^{P}$ using (5) gives:

$$E(P) - E(B) = \left(\alpha_{StockSel}^{P} + \beta_{B}^{P} * \alpha_{4factor}^{B} - \alpha_{4factor}^{B} \right) + \sum_{i=1}^{4} \left(\beta_{f_i}^{P} - \beta_{f_i}^{B} \right) * E(f_i) \qquad (7)$$

or:

$$E(P) - E(B) = \alpha_{StockSel}^{P} + (\beta_{B}^{P} - 1) * \alpha_{4factor}^{B} + \sum_{i=1}^{4} \left(\beta_{f_i}^{P} - \beta_{f_i}^{B} \right) * E(f_i) \qquad (8)$$

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