White Paper

ValueLinefunds

Risk-Adjusted Return:

A Better Small-Cap Measure

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Executive Summary

For most investors, the first step in evaluating a mutual fund is to look at its historical performance despite mutual fund disclosure that "past performance is no guarantee of future results." The second step likely would be to look at a fund's rating by a financial data company such as Morningstar or Lipper, but these ratings are primarily derived from past performance, so the investor returns to square one.

Often in strong rising markets, risk-adjusted returns are underappreciated, especially in the small-cap market. In weak or volatile markets, risk-adjusted returns take on even more importance. In this paper, we look at the significance of incorporating a risk-adjusted return measure in the evaluation of small-cap mutual funds rather than focusing solely on performance metrics. In addition, we explore the notion that it is high-quality small-cap stocks rather than headline-grabbing stocks that lead to consistent long-term performance.

PERFORMANCE VS RISK-ADJUSTED RETURNS

Most investors focus on absolute and relative performance, regardless of asset class. This is reasonable, since the primary purpose of investing is capital appreciation. However, as it relates to capital preservation, investors also need to be keenly aware of their exposure to risk and volatility. When investing in the volatility-prone small-cap sector, these are essential factors to consider.

The Chase for Performance

Human nature is such that we want to be associated with winners and we believe that winners will continue to win. In behavioral finance, the inclination to lean toward winners is called "recency bias," which is the tendency to believe recent events will persist indefinitely in the future.

"Performance chasing" is a common occurrence in the investment world. Research shows that top performing mutual funds attract the most assets from investors. According to a 2009 research paper, individual investors consider a fund's performance track record to be the most important factor in their purchase decision, with the 10-year and previous-year performance being the most influential. Performance chasing was found to be most predominant in the top quintile of funds.[1]

But it's not just individual investors who are swayed by the recency bias. In a study of the fund selection and termination practices of 3,400 retirement plan sponsors between 1994 and 2003, researchers found that retirement plan sponsors tended to select funds after they had experienced large excess returns. However, these funds typically performed no better post-selection than the funds they were replacing. The researchers write, "We find that plan sponsors hire managers after superior performance but on average, post-hiring excess returns are zero."[2]

1. Palmiter, Alan R. and Taha, Ahmed E., Star Creation: The Incubation of Mutual Funds (October 31, 2009). Vanderbilt Law Review, Vol. 62, p. 1485.
2. Goyal, Amit and Wahal, Sunil, The Selection and Termination of Investment Managers by Plan Sponsors (November 2004).

In actuality, most top performing mutual funds tend to deliver weaker near-term future performance. Often, funds with the highest returns also have a high degree of volatility, which by definition, makes them inconsistent performers.

According to the Year-End 2025 S&P Persistence Scorecard, of the actively managed domestic equity funds that were in the top quartile of 12-month performance as of December 2021, only 35.1% remained in the top quartile one year later.[3] Chart 1 shows a bleaker picture when looking at the five consecutive year measurement period, where only 2.4% of the funds remained in the top quartile of performance.

Chart 1: Performance Persistence of Top Quartile Domestic Equity Funds *(for periods ending 12/31)*

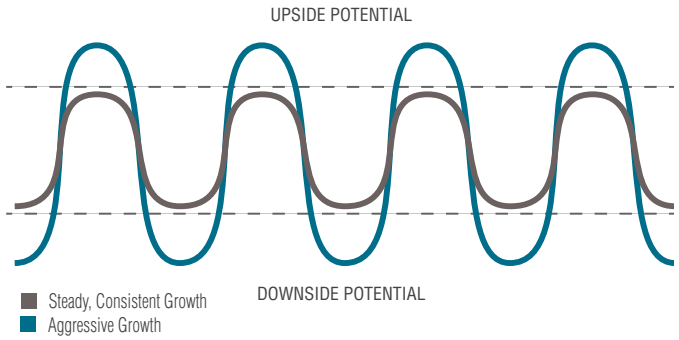
Fund Category	Fund Count as of 2021	% Remaining in Top Quartile			
		2022	2023	2024	2025
All Domestic	505	35.1	0.4	0.0	0.0
Large-Cap	164	20.1	0.0	0.0	0.0
Mid-Cap	61	45.9	4.9	0.0	0.0
Small-Cap	124	44.4	9.7	3.2	2.4
Multi-Cap	120	38.3	0.0	0.0	0.0

Source: S&P Dow Jones Indices LLC.

The Importance of Risk-Adjusted Returns

There are several ways to look at risk. Volatility, generally the most common, is the daily change in the price of an asset and measured by standard deviation. Standard deviation is a statistical measure that shows the likelihood of an investment to yield above- or below-average returns over a period of time. An investment with high volatility will have extreme and erratic price movements, which can ravage long-term performance. While these investments can have explosive price increases, they can quickly reverse course and experience devastating price plunges. Therefore, a lower standard deviation is desired and translates to less volatility.

Graph 1: Varying Volatility Bands



Graph 1 illustrates the fluctuation extremes in price performance of a highly volatile investment versus a less volatile investment.

But volatility doesn't tell the whole story. The Sharpe Ratio measures the risk-adjusted return of an asset, i.e., how much return an investor receives for the level of risk they are assuming. Also, this ratio becomes more meaningful over time since it shows how a fund has performed in different market environments over a full market cycle. Mathematically speaking, the higher the Sharpe Ratio, the better the risk-adjusted return.

Lastly, volatility also represents price movement to either the upside (good) or the downside (bad). Since most investors are impacted more by losses than gains, limiting downside exposure is highly desirable. The Sortino Ratio explains returns relative to downside volatility by only considering downside deviation in the equation. Here, a higher Sortino Ratio indicates less risk of large losses.

Using these risk metrics when analyzing mutual funds will produce a more comprehensive picture of a fund's

3. S&P Dow Jones Indices, Global Research & Design, U.S. Persistence Scorecard (Year-End 2025).

performance and the level of risk involved to achieve that performance. However, these metrics are most useful in comparing one fund to another.

NOT ALL SMALL-CAPS ARE CREATED EQUAL

As a group, the small-cap sector is large in terms of the number of companies it contains. The small-cap sector also includes a substantial number of low-quality companies, which tend to have volatile price behavior often in concert with liquidity issues. However, high-quality companies do exist in the small-cap domain and research suggests that the stocks of these companies consistently outperform other market caps.

In 2013, AQR Capital's Cliff Asness and colleagues published "Quality Minus Junk," a research paper that found that high-quality stocks have high risk-adjusted returns. In the research paper, a quality security is defined as a stock that is safe, profitable, growing and well managed. Quality Minus Junk (QMJ) is a composite portfolio that measures the additional return from investing in quality stocks versus investing in "junk" stocks.[4]

Asness, et al followed with another paper in January 2015, "Size Matters, if You Control Your Junk," which expanded on their past QMJ research and demonstrated that applying the quality screen to small-cap stocks led to a significantly increased Sharpe Ratio (risk-adjusted returns) for the group as well as consistent outperformance of high-quality large-cap stocks. Contrary to the fundamental belief that the highest returns belong to the riskiest small-caps, their results showed that it was the high-quality, low-volatility small-cap stocks that generated high returns.[5]

Additional evidence of quality driving returns is seen in companies with consistent earnings growth. A paper by Professors Barth, Elliott and Finn, "Market Rewards Associated with Patterns of Increasing Earnings," looks at the effect of earnings on returns. "This study demonstrates that firms with patterns of increasing earnings have higher price-earnings multiples than other firms and that this relation persists after controlling for growth and risk."[6]

VALUE LINE SMALL CAP OPPORTUNITIES FUND

Research findings that focus on Sharpe and Sortino Ratios and high-quality small-cap stocks in this paper substantiate the portfolio construction of the Value Line Small Cap Opportunities Fund (VLEOX/VLEIX). The stock selection process seeks growth-oriented companies that have consistently increased both their earnings and stock price over a long timeframe, preferably 10 years or more.

> "The Value Line Small Cap Opportunities Fund seeks growth-oriented companies with increasing earnings and stock price over 10 years or more."

Ten years of growth is a challenging investment requirement in the small-cap sector, but this extended timeframe is used to gauge how individual companies fare in both positive and negative periods during a full market cycle. Companies that satisfy this stringent results-based criteria are usually on the larger side of the small-cap universe, from a capitalization perspective, and exhibit much less volatility.

4. Asness, Clifford S. and Frazzini, Andrea and Pedersen, Lasse Heje, Quality Minus Junk (August 19, 2013).
5. Asness, Clifford S. and Frazzini, Andrea and Israel, Ronen and Moskowitz, Tobias J. and Pedersen, Lasse Heje, Size Matters, If You Control Your Junk (January 22, 2015).
6. Barth, Mary E. and Elliott, John A. and Finn, Mark W., Market Rewards Associated with Increasing Earnings Patterns (Autumn, 1999).

Chart 2: Risk Metrics *(as of 9/30/2026)*

	Standard Deviation	Sharpe Ratio	Sortino Ratio	Upside Capture*	Downside Capture*
3-Year Trailing					
VLEOX	15.92	0.51	0.82	75.75	127.61
Russell 2000	19.55	0.70	1.23	112.88	194.65
Small Growth**	20.33	0.54	0.90	104.18	198.26
5-Year Trailing					
VLEOX	17.34	0.16	0.23	73.03	100.54
Russell 2000	20.83	0.21	0.32	98.95	139.43
Small Growth**	21.49	0.06	0.09	90.24	144.51
10-Year Trailing					
VLEOX	16.80	0.52	0.80	83.17	97.32
Russell 2000	20.90	0.43	0.66	99.06	130.54
Small Growth**	21.11	0.46	0.70	98.28	125.49

Source: Morningstar
*Market Capture Ratios are statistical measures of the Fund's overall performance in up and down markets. Market capture ratios are used to evaluate how well an investment performed relative to the S&P 500 Index during periods when that index has risen or fallen.
**Morningstar Small Growth category

The Fund's risk metrics also validate the research cited in this paper as a focus on high-quality companies has led to better risk-adjusted returns. Chart 2 shows that the Fund's Standard Deviation is more favorable than the Russell 2000 Index and the Morningstar Small Growth category for the past 3-, 5- and 10- year periods ended September 30, 2026.

The Fund also provided investors with more downside protection as measured by a lower downside capture percentage than the Morningstar category average for the 3-, 5- and 10-year periods. As would be expected, the upside capture percentage is below the category, indicating that the Fund avoided excessive volatility.

The downside capture advantage has allowed the Fund to be a defensive play as well. Chart 3 shows the Fund's performance relative to its Morningstar peer group in all of the negative return quarters for the past decade. The Value Line Small Cap Opportunities Fund outperformed the Small Growth category in all but one of the down quarters in the past decade.

CONCLUSION

Chasing performance is part of the human equation. The fact that momentum investing can occasionally be successful makes the tendency harder to resist.

While performance tends to be the measure of choice when selecting a mutual fund, focusing on the risk-adjusted returns of a fund allows an investor to determine how much risk was involved in the fund's return. In a market cap category that is typically volatile, incorporating higher-quality stocks and a focus on the Sharpe and Sortino Ratios into fund selection improves the likelihood of consistent long-term outperformance in small-cap investing.

Chart 3: Playing Defense
VLEOX Outperformed the Small Growth Category in 11 of 12 Negative Quarters in the Past Decade

	4Q18	3Q19	1Q20	3Q21	1Q22	2Q22	3Q22	3Q23	2Q24	1Q25	1Q26	3Q26
Value Line Small Cap Opportunities Fund (VLEOX)	-15.15	-0.82	-19.40	1.74	-11.38	-12.57	-5.09	-5.34	-1.63	-7.56	1.15	-8.16
Morningstar Small Growth Category	-20.82	-4.17	-24.59	-2.57	-12.78	-19.80	-1.35	-6.52	-2.58	-10.51	-2.07	-9.58
+/- Category	**5.67%**	**3.35%**	**5.19%**	**4.31%**	**1.40%**	**7.23%**	**-3.74%**	**1.18%**	**0.95%**	**2.95%**	**3.22%**	**1.42%**

Source: Morningstar

Value Line Small Cap Opportunities Fund Performance

As of 9/30/2026

	Average Annual Return			
	1 Year	3 Year	5 Year	10 Year
Investor Class - VLEOX	**5.34%**	**12.09%**	**5.27%**	**10.36%**
Institutional Class - VLEIX	**5.60**	**12.37**	**5.53**	**10.64**
S&P MidCap 400 Index	11.69	14.54	8.03	10.47
Morningstar Small Growth Category Avg.	11.34	14.65	2.94	10.46
Morningstar Category Rank (%) - VLEOX	**79**	**74**	**29**	**48**
# of Funds in Category	531	519	497	406
Morningstar Return		**Below Avg.**	**Above Avg.**	**Average**
Morningstar Risk		**Low**	**Low**	**Low**

VLEOX Gross/Net Expense Ratio: 1.21% | VLEIX Gross/Net Expense Ratio: 0.97%

Overall MORNINGSTAR® Rating

★★★★

(VLEOX)
Among 519 Small Growth Funds
(as of 9/30/2026)

The Overall Morningstar Rating™ is based on risk adjusted returns, derived from a weighted average of the 3-, 5-, and 10-year Morningstar metrics.

Morningstar rates funds based on enhanced Morningstar risk-adjusted returns.

The performance data quoted herein represents past performance and does not guarantee future results. Market volatility can dramatically impact the fund's short term performance. Current performance may be lower or higher than figures shown. The investment return and principal value will fluctuate so that an investor's shares, when redeemed may be worth more or less than their original cost. Past performance data through the most recent month end is available at vlfunds.com or by calling 800.243.2729.

The average annual returns shown above are historical and reflect changes in share price, reinvested dividends and are net of expenses. Investment results and the principal value of an investment will vary.

ABOUT THE AUTHOR

Stephen Grant, Portfolio Manager

Stephen Grant has been a portfolio manager at Value Line Funds since 1991. Over the past 35 years, Mr. Grant's quantitative/behavioral methodology has driven the success of several equity and hybrid funds. Mr. Grant has a BA in Economics from Stanford University and an MBA in Finance from the Wharton School of the University of Pennsylvania.

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You should carefully consider investment objectives, risks, charges and expenses of Value Line Mutual Funds before investing. This and other information can be found in the fund's prospectus and summary prospectus, which can be obtained free of charge from your investment representative, by calling 800.243.2729, or by clicking on the applicable fund at www.vlfunds.com. Please read it carefully before you invest or send money.

The Morningstar Rating™ for funds, or "star rating" is calculated for managed products (including mutual funds, variable annuity and variable life subaccounts, exchange-traded funds, closed-end funds, and separate accounts) with at least a three-year history. Exchange-traded funds and open-ended mutual funds are considered a single population for comparative purposes. It is calculated based on a Morningstar Risk-Adjusted Return measure that accounts for variation in a managed product's monthly excess performance, placing more emphasis on downward variations and rewarding consistent performance. The top 10% of products in each product category receive 5 stars, the next 22.5% receive 4 stars, the next 35% receive 3 stars, the next 22.5% receive 2 stars, and the bottom 10% receive 1 star. The Overall Morningstar Rating for a managed product is derived from a weighted average of the performance figures associated with its three-, five-, and 10-year (if applicable) Morningstar Rating metrics. The weights are: 100% three-year rating for 36-59 months of total returns, 60% five-year rating/40% three-year rating for 60-119 months of total returns, and 50% 10-year rating/30% five-year rating/20% three-year rating for 120 or more months of total returns. While the 10-year overall star rating formula seems to give the most weight to the 10-year period, the most recent three-year period actually has the greatest impact because it is included in all three rating periods. The Value Line Small Cap Opportunities Fund (VLEOX) recieved 3 stars for the 3-year period, 4 stars for the 5-year period and 4 stars for the 10-year period ended 9/30/2026, out of 519, 497, and 406 Small Cap Growth funds, respectively. © 2026 Morningstar, Inc. All Rights Reserved. The information contained herein: (1) is proprietary to Morningstar and/or its content providers; (2) may not be copied or distributed; and (3) is not warranted to be accurate, complete, or timely. Neither Morningstar nor its content providers are responsible for any damages or losses arising from any use of this information.

There are risks associated with investing in small and mid-cap stocks, which tend to be more volatile and less liquid than stocks of large companies, including the risk of price fluctuations.

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