Stock Returns Exhibit Negative Skew

Why the shape of returns matters for asset allocation

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1 Abstract

One of the most neglected aspects of asset allocation is the concept of *skew*. The conventional approach to portfolio construction concentrates on the *magnitude* of expected returns from major asset classes over a given investment horizon. However, this approach pays relatively little attention to the *shape* of expected returns. This paper presents empirical evidence that stock market returns exhibit negative skew: positive returns occur with higher frequency, but negative returns have higher magnitude. Using S&P 500 data from 2000 to 2025, we demonstrate this asymmetry and discuss its implications for risk management.

2 The Nature of Skewness

Stock markets go up most of the time. But on the relatively rare occasions they go down, they can go down a lot. This asymmetry is called *negative skew*.

Mathematically, skewness measures the asymmetry of a probability distribution. For a random variable X with mean μ and standard deviation σ, skewness is defined as:

$$\text{Skew}(X) = \mathbb{E}\left[\left(\frac{X-\mu}{\sigma}\right)^3\right]$$

- **Negative skew**: The left tail is longer; large negative outcomes occur more frequently than a normal distribution would predict.
- **Positive skew**: The right tail is longer; large positive outcomes are more frequent.
- **Zero skew**: The distribution is symmetric (e.g., the normal distribution).

3 Empirical Evidence

3.1 Stocks Go Up Most of the Time

Even when stocks move sideways over extended periods, the pattern of returns reveals an important asymmetry. The chart below shows the S&P 500 index from 2000 to 2025, a period that includes the dot-com crash, the Global Financial Crisis, the COVID-19 pandemic, and the 2025 tariff shock.

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3.2 Counting Quarters

The sample period (Q1 2000 through Q4 2025) is bookended by episodes of exuberant stock markets: the dot-com bubble at the start and the AI euphoria at the end. This makes for a representative sample to quantify the skew of stocks.

	Metric	Value
0	Total Quarters	103.0
1	Positive Quarters	70.0
2	Negative Quarters	33.0
3	Win Rate (%)	68.0
4	Best Winning Streak	9.0
5	Worst Losing Streak	6.0
6	Quarters -15%	7.0
7	Quarters +15%	1.0

Counting positive versus negative quarterly returns, the S&P 500 confirms that stocks have gone up about 70 percent of the time. The best winning streak was 9 consecutive positive quarters while the worst losing streak was 6 consecutive negative quarters.

Yet the worst negative quarterly returns had a much higher magnitude than the best positive quarterly returns. There were 7 quarters with (log) returns of -15 percent or worse but only 1 quarter with (log) return of +15 percent or better (the pandemic rebound in Q2 2020). This confirms that stock market returns exhibit negative skew.

4 Distribution of Returns

The histogram below shows the distribution of quarterly log returns for the S&P 500. The red curve represents a kernel density estimate (KDE) of the empirical distribution. Note the pronounced left tail, evidence of negative skewness.

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	Statistic	Value
0	Skewness	-1.013
1	Excess Kurtosis	1.032
2	Mean Quarterly Return (%)	1.470
3	Std Dev (%)	8.380

5 Implications for Asset Allocation

Given that stock markets go up most of the time, the default asset allocation to stocks should be overweight. Allocators should downweight stocks from this default overweight position only when they anticipate the relatively few episodes of deeply negative returns.

Meanwhile, bond returns in this sample display an approximately symmetric distribution of positive and negative outcomes, both in frequency and in magnitude, indicating near-zero skewness rather than strong upside or downside asymmetry.

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Given that bond returns in this sample exhibit only modest skewness, the default strategic allocation to bonds can be viewed as neutral, with tilts around that baseline driven primarily by expected changes in their risk and return, rather than by pronounced asymmetry in their return distribution.

6 Conclusion

The empirical evidence is clear: stock market returns exhibit negative skewness. While equities deliver positive returns approximately 70% of the time, the magnitude of negative returns during market downturns far exceeds that of positive returns during rallies. This asymmetry has profound implications for portfolio construction and risk management. Investors must account not only for the expected magnitude of returns but also for their shape.

As the old Wall Street adage goes: **"Stocks take the stairs up and the elevator down."**