

MONETA INVESTMENT MONTHLY

Probability vs. Certainty: Don't Judge an Index by Its Average

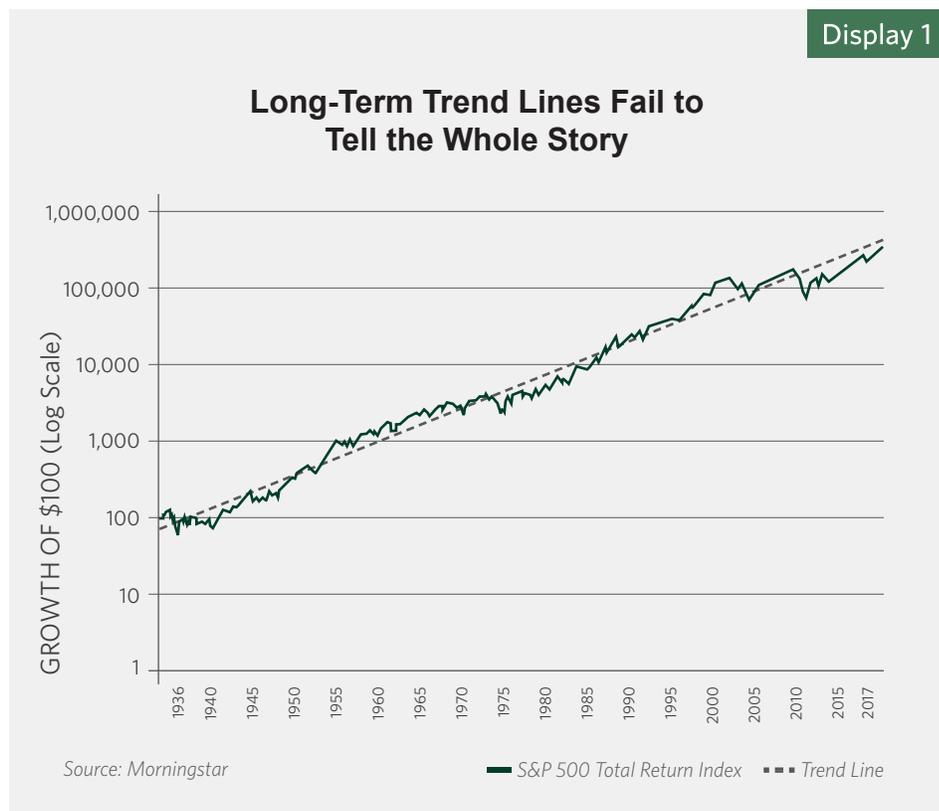
One glance at a chart illustrating the long-term growth of the S&P 500 (*Display 1*), or any other major market index, may lead you to believe it's been mostly smooth sailing for these indices. But a closer look reveals that the waters weren't exactly calm along the way.

Unexpected events—both large and small in magnitude—and dynamic changes arose throughout the journey that altered the markets' course. On a broader scale, it's difficult to see the different parts of time, whether it be eras, regimes or cycles, which make up the whole of a market's history.

It can be tempting to think that investing is a simple exercise when only looking at the big picture painted by the trend line of an index return. With the benefit of hindsight, it can seem as if the historical returns (and events that underlie them) were destined to occur, and that the slope of the trend line will continue in perpetuity at its current trajectory. However, along the path, points along the historical line can be thought of as possibilities that came to fruition. What remains unseen are the myriad of possibilities that did not occur, the branches of a decision tree that fell by the wayside, and the portions of a probability distribution that never materialized.

Life Is Not Lived in the Averages

When investors speak about historical returns, often times they speak in terms of the "average" return of a

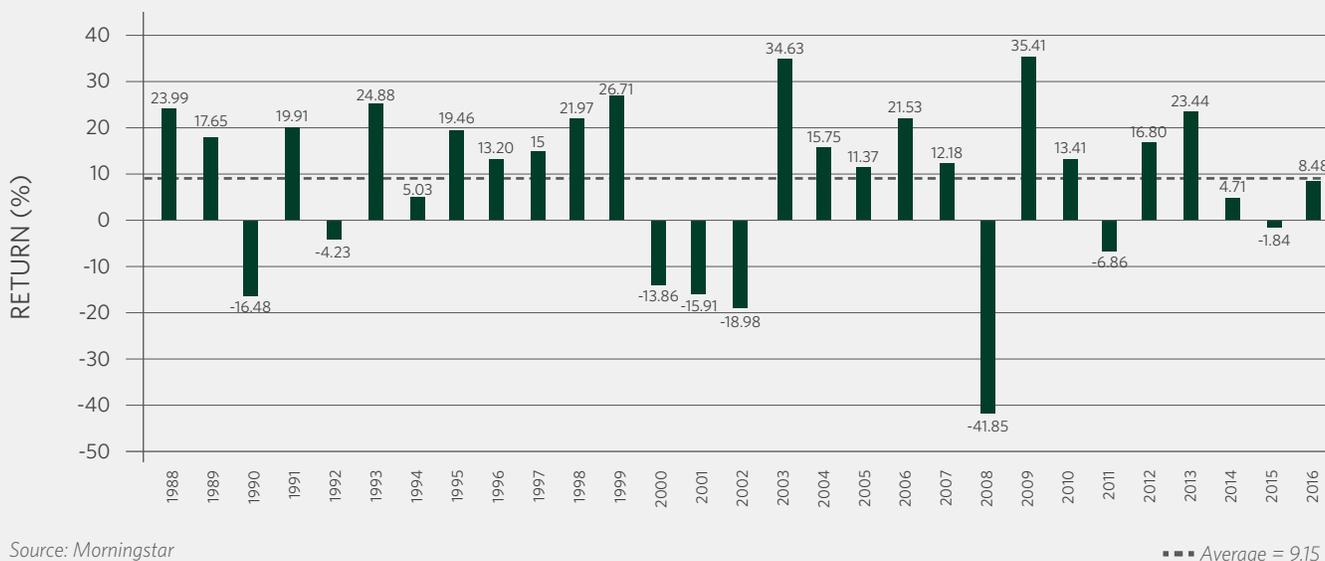


certain market or index. The average return can refer to the arithmetic mean (the sum of all returns divided by the number of observations) or geometric mean, otherwise known as the compound annual growth rate (CAGR), which measures the compounded rate of return over a given time frame. In reality, the average arithmetic mean return is rarely, if ever, experienced. What an investor "feels" are the year-to-year market gyrations that ultimately inform the average return.

As an example, Display 2 (next page) shows the historical calendar-year returns for the MSCI All Country World

Index (ACWI), a broad market-cap weighted global equity index, since its inception date. The average annual return over the past 20 years was 9.15%, with the yearly observations scattered above or below it. The return in a given year may approach the average, but will rarely, if ever, be realized over an observation period. This is because the average is a moving target and not static. It fluctuates because it's calculated using a collection of individual observations. As additional data points are added, the number shifts to reflect the new information, and the level of the trend line changes.

MSCI ACWI Index Annual Returns



What’s an Investor to Do?

For planning purposes, the average return should be included as an input into a Monte Carlo or stochastic modeling process, which is useful for assessing multi-period time horizons of a portfolio. However, rather than focusing on the precise return number itself, it’s important to consider the distribution, or dispersion, of possible outcomes around the average return.

When evaluating future returns, one should think about probability rather than certainty, possibility rather than specificity. To use a practical example, it’s difficult to guess the exact high temperature on July 4th in St. Louis, but it’s very likely that a high temperature on July 4th will be greater than the high temperature on January 4th. To state the obvious, it’s more likely you’ll be comfortable wearing flip flops in summer and snow boots in winter, rather than vice versa. Just as the average return will change over time, the Monte Carlo inputs can also be modified to account for present-day realities. This applies not only to changes in the return and risk assumptions for the portfolio assets, but also to changes in goals, needs or wants.

Using a dynamic process, maintaining perspective and flexibility, and thinking in terms of probability rather than certainty can be very helpful in portfolio management and planning for the future. It’s also important to think beyond the averages and keep the following in mind:

The average return is rarely observed in reality.

The average return is time-period-dependent and changes as additional observations are added to the data set.

When simulating future portfolio returns, think in terms of probability rather than absolute certainty.

Geoffrey Eikmann, CFA | Senior Investment Analyst

