Rolling Returns May Conceal More Than They Reveal

Could cumulative return charts provide better information than rolling or fixed period horizon charts?

Standard presentations in the investment management industry—both charts displaying rolling returns and tables using fixed period horizons—often conceal more information than they reveal. The result is that investors may draw (or be led to) erroneous conclusions. We believe that cumulative return charts are superior because they incorporate all relevant performance information without the biases introduced by rolling or fixed period return horizons.

This Viewpoint illustrates how cumulative relative return charts help investors identify regime changes, cycles and other return patterns that are less apparent in rolling and fixed period horizon reports.

(650) 328-7283
www.alanbiller.com

Alan Biller and Associates
Investment Consultants

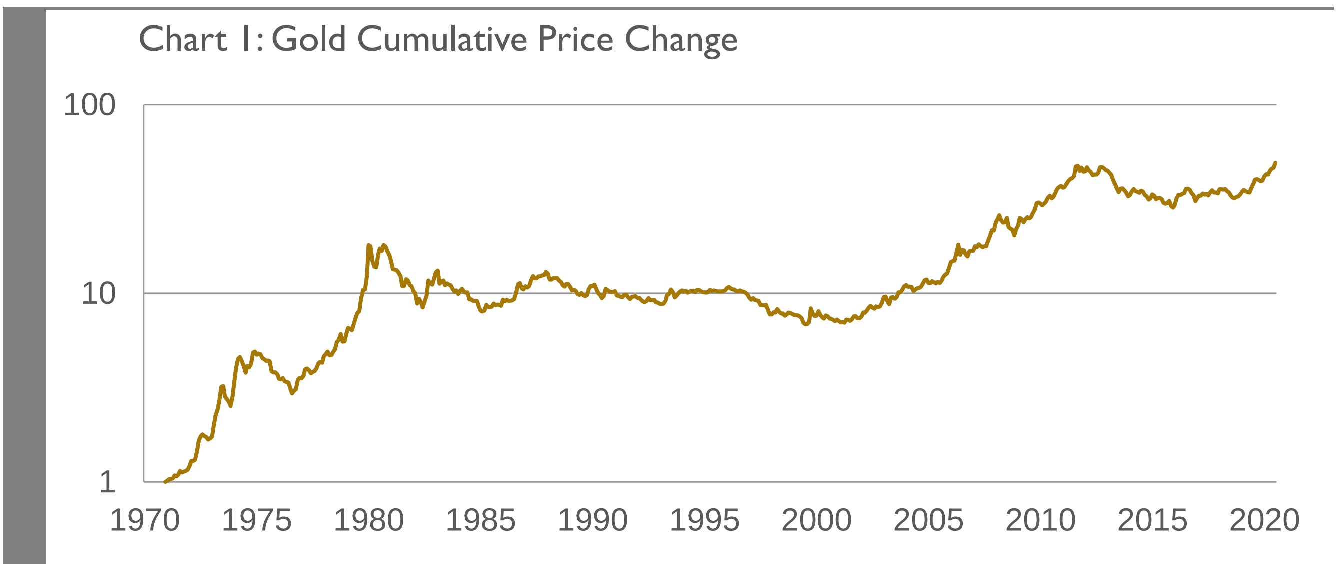
Rolling Returns

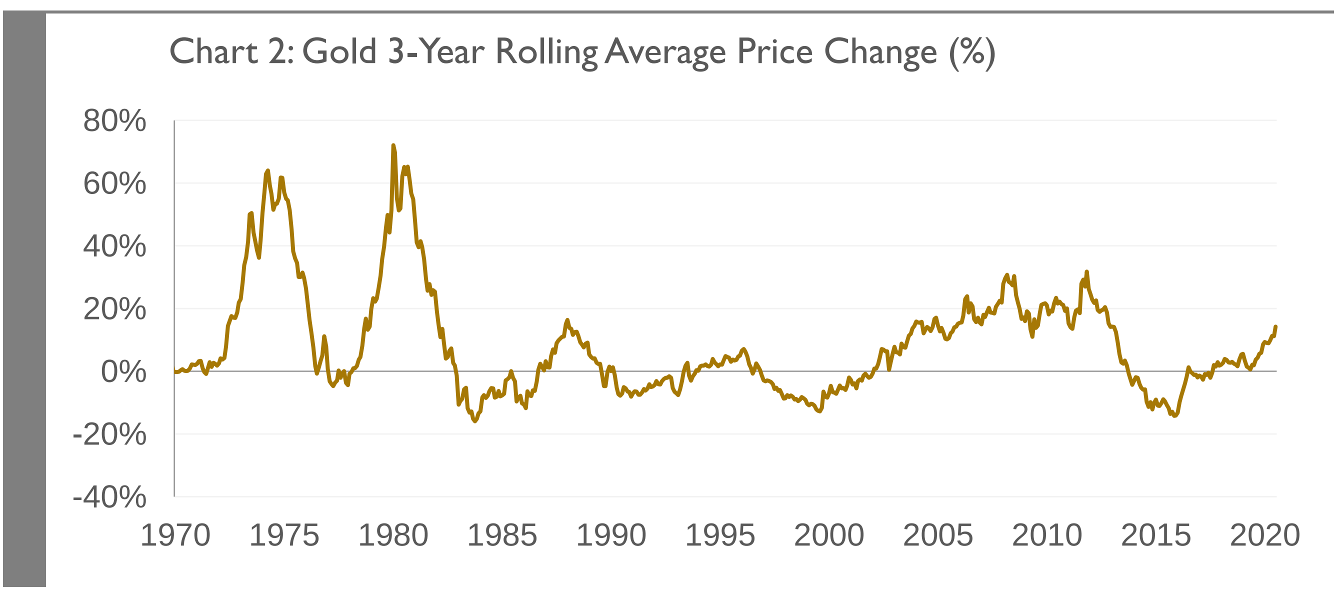
Charts displaying rolling returns are an investment industry standard and provide a useful perspective about the range of likely outcomes over a particular time horizon. For example, the following question is well illuminated using a rolling-return analysis: *Historically, how frequently has the stock market lost money in a discrete 10-year period?* However, patterns of rolling returns are often used to describe how an asset class, investment strategy, or manager performed over time, an approach we believe is flawed. Performance over a fixed look-back window (e.g., 3 years) is unlikely to align with longer-term return cycles. In addition, this fixed look-back approach smooths returns, further limiting insight into asset class, investment strategy, or manager performance. For example, high-yield bonds fell 30% between August and November 2008, yet the 3-year moving average was -8% at the end of the period. Similarly, high-yield bonds fell 11.5% in March 2020 while the corresponding 3-year moving average was positive 1% at the end of that same month.

Moreover, as the look-back window advances, the average return changes—both because a new return is added, and because a previous period return is dropped. In contrast, cumulative return charts provide a more accurate long-term perspective because current data are continuously added but previous periods' returns are never dropped. This inclusive, comprehensive approach enables better identification of regime changes in general, and managers' true, long-term relative performance in particular.

Because rolling return analyses are based on fixed look-back windows, investors cannot readily discern the source of performance fluctuations. For example, when the average return in a performance chart showing rolling returns rises (falls), was it because the return in the added month was better (worse) than the immediately preceding rolling average or, as the fixed period advanced, was the return in the dropped month worse (better)? The stock market's performance in October 1987 dramatically illustrates this effect. The S&P 500 dropped 22% in October 1987, reducing its rolling 3-year average annual return 10.2%, from 29.3% to 19.1%. In October of 1990, the S&P 500 gained 5.6%, but because October 1987 fell out of the rolling 3-year calculation, the index's 3-year average annual return jumped 8.4%, from 1.9% to 10.3%.

In terms of identifying market regimes and inflection points, the charts below illustrate the power of cumulative returns relative to rolling returns. Using gold as an example, **Chart 1** shows the cumulative percentage change in the price of gold since December 1970. **Chart 2** shows the rolling average 3-year percentage change. Note that the price of gold began to fall in December 1974, but the 3-year rolling return did not turn negative until July 1976, 19 months later. Similarly, the price of gold fell from September 1980 through February 1985, but the 3-year average return didn't turn negative until December of 1982, two years after the gold price started down.





Charts showing mutual funds' or investment managers' rolling returns relative to their benchmarks have similar problems. **Charts 3 and 4** show a fund benchmarked to the S&P 500. As with the gold example, the cumulative relative return chart is much more informative than the rolling return chart. In both charts, periods of outperformance are denoted in green, periods of underperformance in red, and periods of neutral, benchmark-like performance in blue. (While the choice of starting and ending points is subjective, other choices produce similar findings.) A comparison of the two charts shows that often more than a year passed before the rolling return caught up and matched the direction of the cumulative return. For example, Chart 3 shows that the fund generally outperformed the S&P from October 1987 through March 1994 and then underperformed, but the rolling 3-year return did not turn negative until January 1996. Similarly, the fund's performance turned positive in June 2000, but the rolling 3-year return remained negative until June 2001.

Chart 3: Manager's Cumulative Relative Return

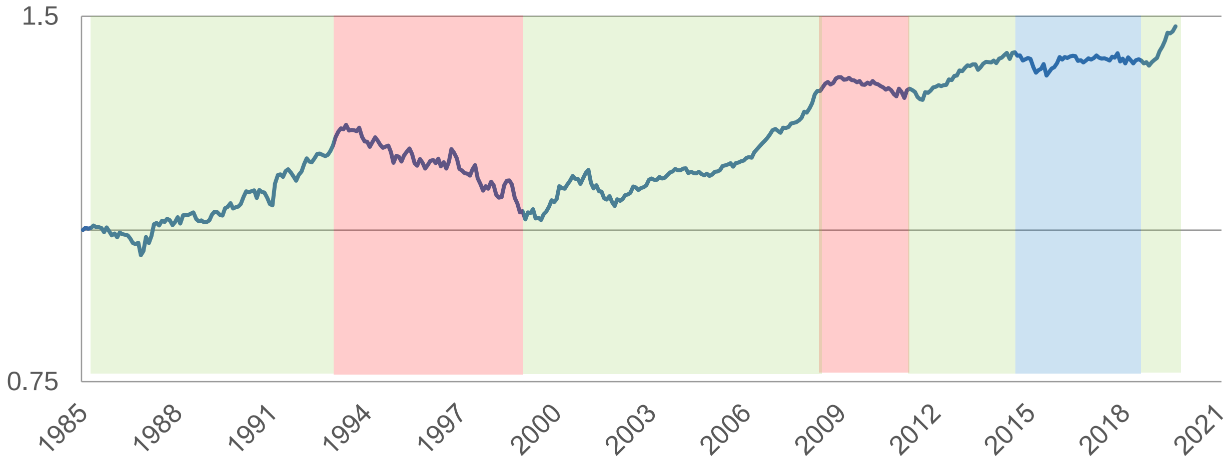
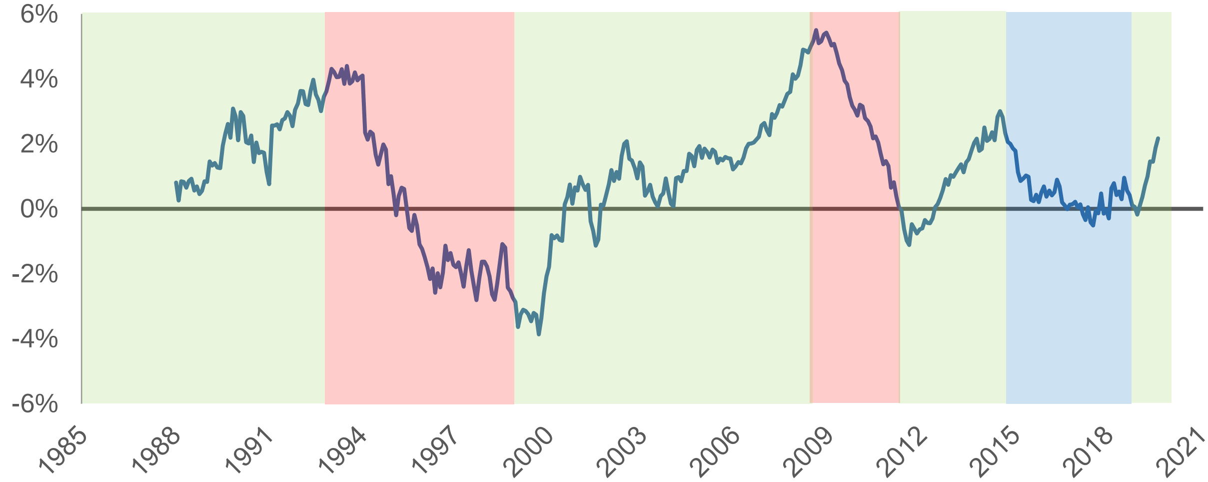


Chart 4: Manager's Rolling 3-Year Relative Return



Fixed Period Horizon Reports

Most reporting systems display performance over multiple, fixed period horizons (e.g., trailing 1-, 3-, 5-, 7- and 10-year periods). Because these reports include multiple periods, investors often infer that a strategy exhibiting positive performance for all trailing periods exhibited consistent performance. As shown below, that inference is not necessarily correct. **Charts 5 and 6** plot the past performance of a fund versus the S&P 500 through March 2021. Chart 5 shows the fund's full history in the form of its cumulative relative return. The fund performed well: at the end of the 30-year investment period, a dollar invested in the fund would have grown to $40, while a dollar invested in the S&P would have grown to $20. A closer examination of the chart shows the fund performed in line with the benchmark for the 10 years between 2009 and 2019.

Chart 5: 20-Year Cumulative Relative Return

Chart 6 shows the fund's performance for just the last 10 years. For that period, the fund's relative return was 115% of the S&P. A closer examination shows that the fund's performance was behind the benchmark at the end of 2018, even with the benchmark 15 months later, and strongly ahead by the end of 2020. This pattern would not be not visible in a fixed period horizon report.

Chart 6: 10-Year Cumulative Relative Return

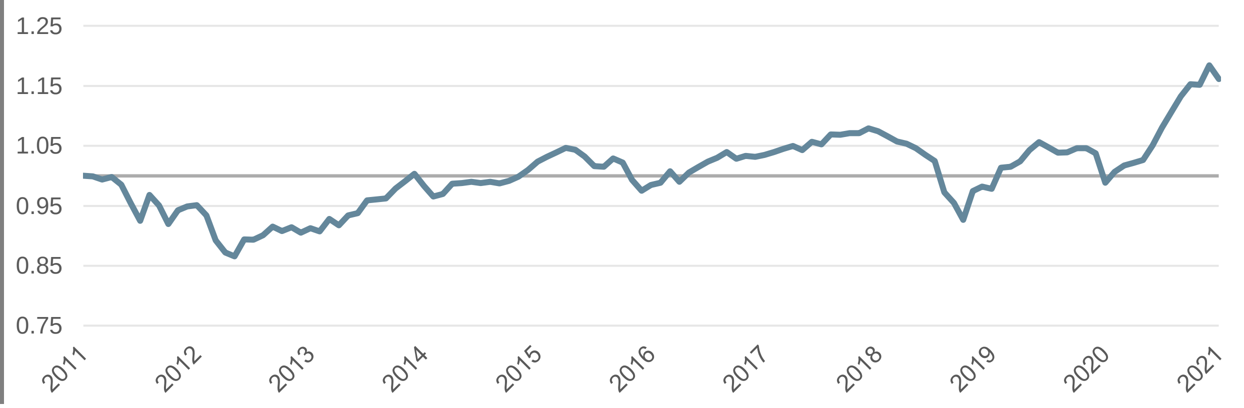


Table 1 presents a fund's performance for several, standard look-back periods. As seen, the fund outperformed the S&P in all periods; however, as shown in Chart 6, the fund's outperformance was acutely concentrated in the last 12 months (i.e., the twelve-month period ended March 2021). In fact, when that concentrated period of outperformance is excluded, the fund's longer-term performance becomes neutral to slightly negative as shown in the far-right column of Table 1.

Table 1: Absolute and Relative Performance *as of March 31, 2021*

	Fund B	S&P	Value Add	Omit Latest Year
1 Year	83.7%	56.4%	27.3%	
3 Year	19.8%	16.8%	3.1%	-4.1%
5 Year	20.2%	16.3%	3.9%	0.1%
7 Year	16.3%	13.6%	2.7%	0.1%
10 Year	15.6%	13.9%	1.7%	-0.1%

Summary

While rolling return charts and fixed period horizon reports are industry standards, we believe these depictions often conceal more information than they reveal. Relative to underlying broad market trends, the duration and amplitude of asset class, strategy, and manager performance vary such that comparisons using rolling returns with specified look-back periods are often misaligned. As a result, analyses using a rolling return format may underestimate volatility, or miss performance regime changes and important inflection points, potentially leading to misinterpretation by investors.

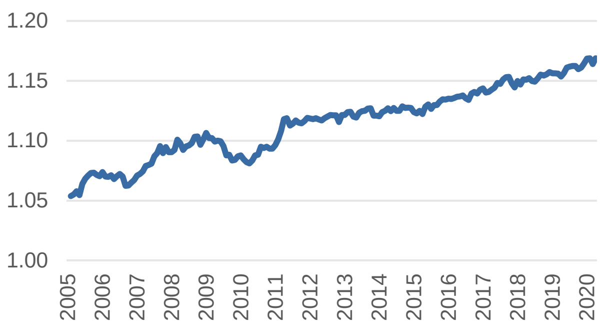
In addition, the rolling return format may be misleading since data dropping out of the look-back window has as much influence on the calculations as new data entering the window, yet investors' inclination is to infer that the changes were solely due to new data. While many investors may be aware of past periods of large anomalous performance (e.g., October 1987) and make mental adjustments for them, the typical ebb and flow of relative performance is sufficiently subtle to obfuscate longer-term performance trends when a rolling-returns format is applied.

Finally, even though longer-period returns may be included, fixed period horizon reports are heavily influenced by the most recent result entering the calculation. If the recent result is large enough (positive or negative), it can dominate earlier period returns, making analyses based on performance reports with multiple look-back periods misleading.

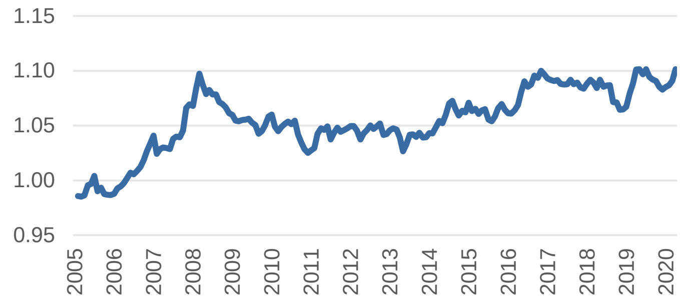
Appendix 1: Strategy Relative Return Chart Examples

Appendix 1 presents cumulative, relative return charts for six strategies benchmarked to the S&P 500.

Steady Value-Add over Past 10 Years

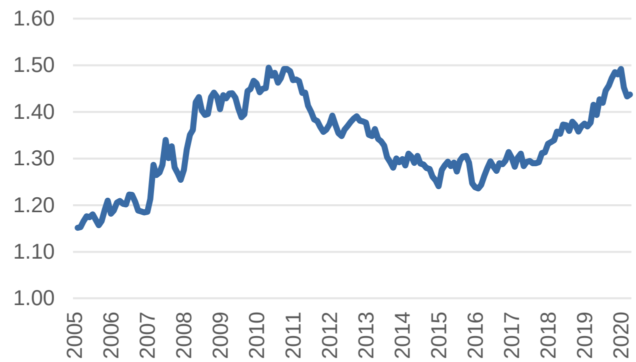


Added Value Last 10 Years, but Episodic Performance

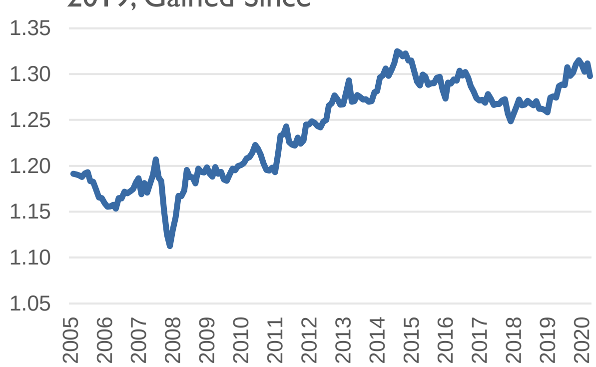


All Value-Add Came in 2020

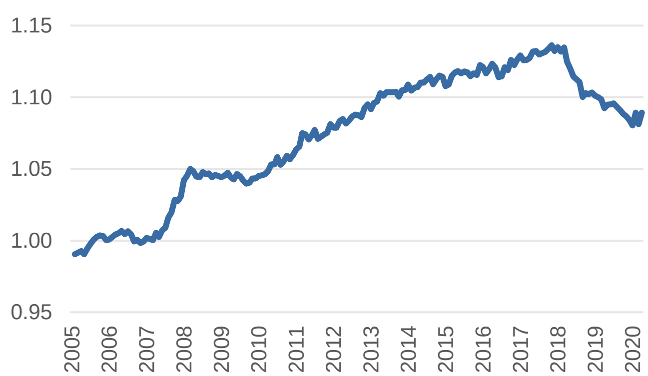
Positive Last 5 Years, Negative 5 Before



Positive 2005 to 2015, Negative Through 2019, Gained Since



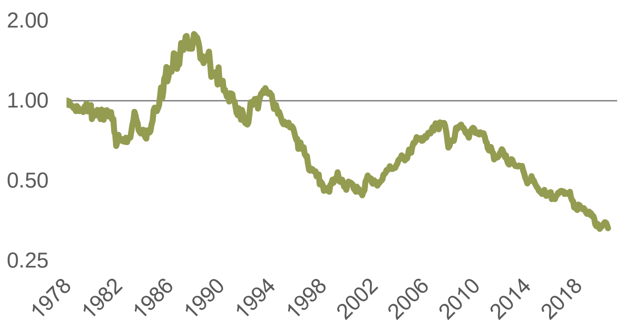
What Happened At the End of 2018?



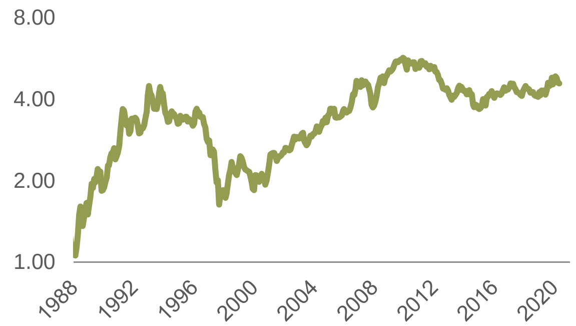
Appendix 2: Asset Class Relative Return Chart Examples

Appendix 2 shows cumulative, relative return charts for six asset classes. Intended to assist investors in understanding patterns in manager and asset class performance, these charts illuminate more and better information than that available in rolling return or fixed period horizon formats.

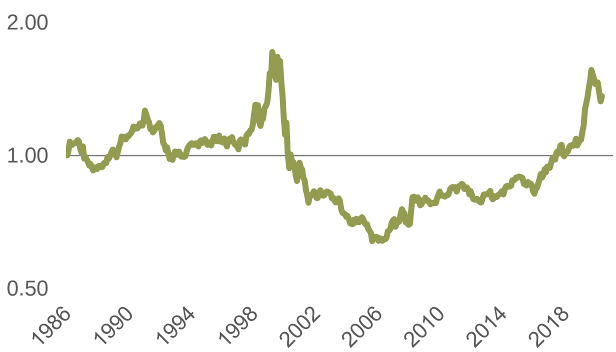
International vs US Stocks



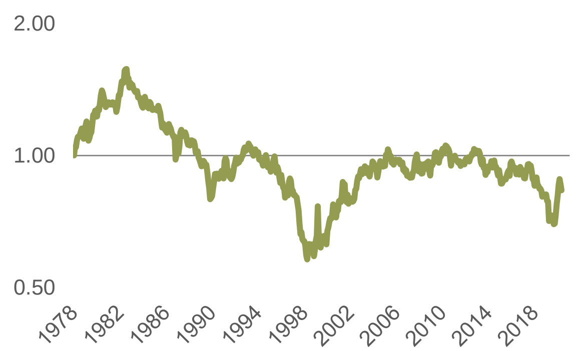
Emerging vs Developed



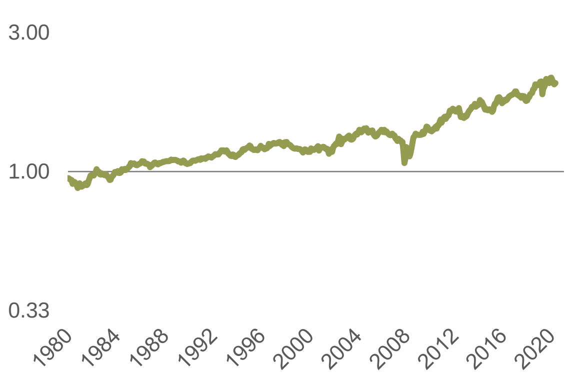
Growth vs Value



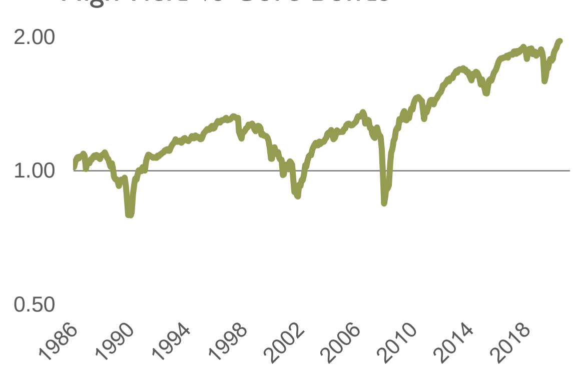
Small vs Large



Long Corporate Bonds vs Core Bonds



High Yield vs Core Bonds



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