FOLLOWING THE TREND:

A Systematic Framework for Fixed Income Investing

CAMBRIA

US stocks have been on a tear. The S&P 500 gained nearly 25% in 2024 and averaged over 13% per year over the last decade through year end 2024.

Thanks to the same tools that have made investing more accessible, speculation has been supercharged—fueled by subreddits with tens of millions of followers, where the number of rocket emojis can move a stock, and gamified trading apps encourage a "YOLO" mentality. In a market environment filled with headlines about triple-digit gains from names like Applovin, MicroStrategy, and Nvidia, it's difficult to see beyond the glamor of stocks.

With that backdrop, bonds struggle for attention. Bonds simply don't generate the same excitement as high-flying growth stories, especially in an era where volatility and big wins dominate the investing conversation.

Part of that reason perhaps is the long period of low to no interest rates, and the resulting poor bond returns.

For reference, the Bloomberg US Aggregate Index, which tracks the performance of a group of bond sectors including US Treasuries, corporate bonds, asset-backed securities, and mortgage-backed securities, returned 1.25% over the last decade through year end 2024.

With bond yields rising to over 4%, might they play a more integral role in the portfolio? And if so, what might that be? Ask the average investor what they think of bonds and you'll probably hear one word: boring.

But the lack of drama may be exactly the point. Traditionally, they do have lower volatility than stocks, but as some investors recently experienced, they can still go through painful drawdowns. For an asset that is meant to represent a defensive allocation, is there a way to reduce the large drawdowns?

Despite their quieter performance, bonds can be a foundational component of many portfolios.

Our very first white paper examined the topic of trend following on assets, and found on average, that trend following helped to reduce volatility and large drawdowns.

Today's paper will apply the same lens to all things fixed income.

To explore that, we looked at the Bloomberg US Aggregate Bond Index "US Agg", what is considered by some to be the definitive proxy for the U.S. bond market, just as the S&P 500 serves as a proxy for U.S. stocks.

With over $250 billion in assets tracking the index It is commonly used for broad market exposure to the asset class, and many investors are invested in funds and ETFs that track it. Since the US Agg is comprised of investment-grade US debt, it only provides partial exposure to the broader US bond market. Excluded are higher-risk fixed-income segments such as high-yield ("junk") bonds, convertible bonds, and preferred stocks. These typically carry lower credit ratings and higher volatility — but also generally have higher yields and can potentially improve overall portfolio diversification benefits.

We'll apply a similar model to the one in the original white paper and use the 200 day simple moving average as our trend indicator. This basic trend-following system can be seen below:

Rebalance Frequency: Monthly

Buy Rule: Long when the month-end closing price is > 200-day SMA

Sell Rule: Shift to T-Bills when the month-end closing price is < 200-day SMA

Position Sizing: Equal weighted

1. All entry and exit prices are on the day of the signal at the close. The model is only updated once a month on the last day of the month. Price fluctuations during the rest of the month are ignored.
2. All data series are total return series, including dividends, updated monthly.
3. Taxes, commissions, and slippage are excluded (see the Practical Considerations section later in the paper).

In essence, the model systematically indicates when investors should remain invested in the Agg and when they should move to cash (i.e. T-Bills).

To start, we applied the trend-following system outlined above to the Agg going back to 1990. The strategy would be 100% invested in Agg if it closes above its 200-day SMA at month end, or 100% invested in T-Bills if it closes below. We refer to this system as "Agg Timing" in the exhibits.

Exhibit I shows the risk and return statistics for both Buy-and-Hold Agg and the Agg Timing model.

Exhibit I: Risk and Return Statistics January 1990 through September 2025

	US AGG	Agg Timing
Annual Return	5.06%	5.11%
Vol	4.14%	3.46%
Sharpe	0.57	0.69
Max Drawdown	-17.18%	-7.56%
Skew	-0.30	-0.17

SOURCE: Bloomberg and Cambria. Past performance is not a guarantee or indicator of future results.

The results align with most all of the trend following research to date. The return statistics are similar, but the risk statistics improve with lower volatility and drawdowns.

Exhibit II: Equity Curve January 1990 through September 2025

SOURCE: Bloomberg and Cambria. Past performance is not a guarantee or indicator of future results.

Building upon the previous analysis, we included a portfolio built of higher-risk bond segments to assess whether the systems' inherent risk-mitigation capabilities could effectively manage the increased volatility of each bond segment, while capturing the enhanced upside potential typically associated with riskier bonds. The risk bond categories and their respective indices can be seen below.

Exhibit III: Index

Risk Bond Categories	Index Name
Convertibles	Bloomberg U.S. Convertibles Liquid Bond Total Return Index
High-Yield Corporates	Bloomberg U.S. Corporate High Yield Bond Total Return Index
Preferred Stock	S&P U.S. Preferred Stock Total Return Index
Long-Term Treasuries	Bloomberg U.S. Long Treasury Total Return Index

Without access to reliable historical total return data for convertible bonds and preferred stocks, our analysis was limited to a 20-year period extending back to 2005. For our own edification we also applied the trend following system to a portfolio of long-term treasuries, investment grade corporates, and high yield corporates to analyze hypothetical results going back to the 1980s. These results can be seen in appendix A.

While the system rules remain consistent with those previously outlined, expanding our investable universe to include multiple bond categories led to adjusted position sizing allocations from a binary weighting, 100% in the Agg or 100% in T-Bills, to 25% weight per risk bond category. If a risk bond category index price was below its 200-day SMA at the end of the month, its 25% allocation was invested in T-Bills, otherwise the system was invested in the bond category. We refer to the updated simulation as Fixed Income Trend in the exhibits.

Exhibit IV contains the risk and return statistics for Buy-and-Hold Agg, Agg Timing system, Fixed Income Trend system, and Buy and Hold Risk Bonds from January 2005 through September 2025.

Over the truncated period, Agg Timing exhibited a similar absolute return profile to US Agg with improved risk statistics, leading to higher risk-adjusted returns.

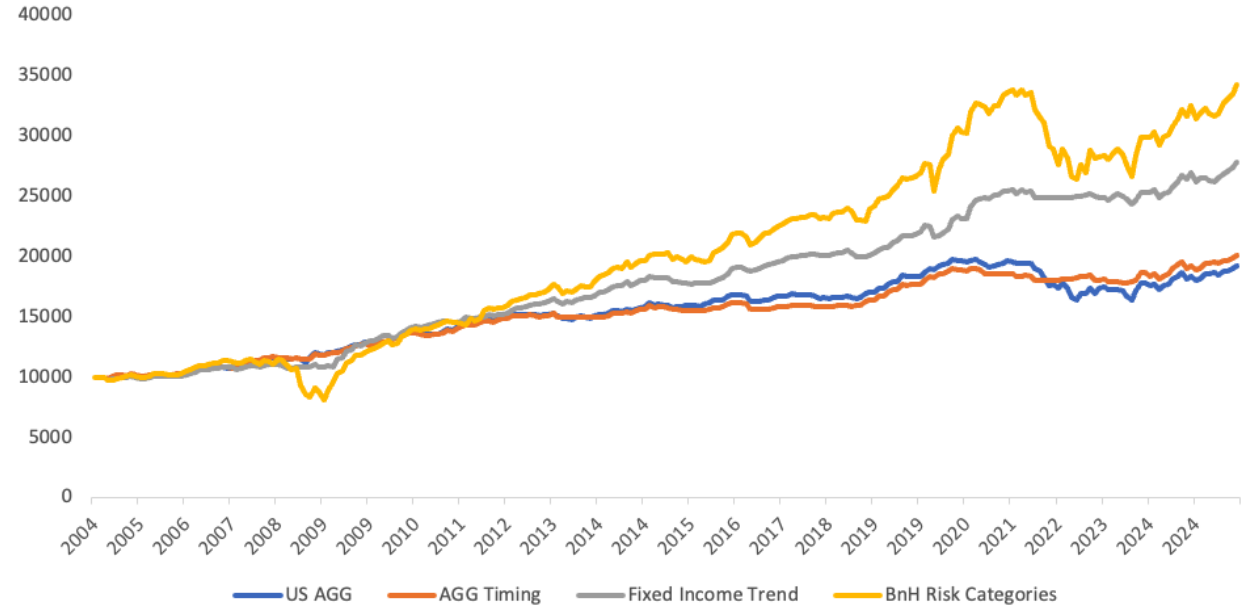
The Fixed Income Trend simulation showed that applying the system to higher-risk bonds resulted in outperformance of over 180 basis points annually, a higher Sharpe Ratio, lower volatility, and significantly reduced max drawdown relative to US Agg. Buy and Hold Risk Bonds produced the highest returns, but at a cost of higher volatility and larger drawdowns.

Exhibit IV: Index

	US AGG	Agg Timing	Fixed Income Trend	BnH Risk Categories
Annual Return	3.20%	3.40%	5.07%	6.12%
Volatility	4.20%	3.19%	3.87%	8.77%
Sharpe	0.38	0.55	0.88	0.54
Max Drawdown	-17.18%	-7.56%	-4.63%	-29.05%
Skew	-0.17	0.10	0.40	-0.48

SOURCE: Bloomberg, S&P Global, Cambria. Past performance is not a guarantee or indicator of future results.

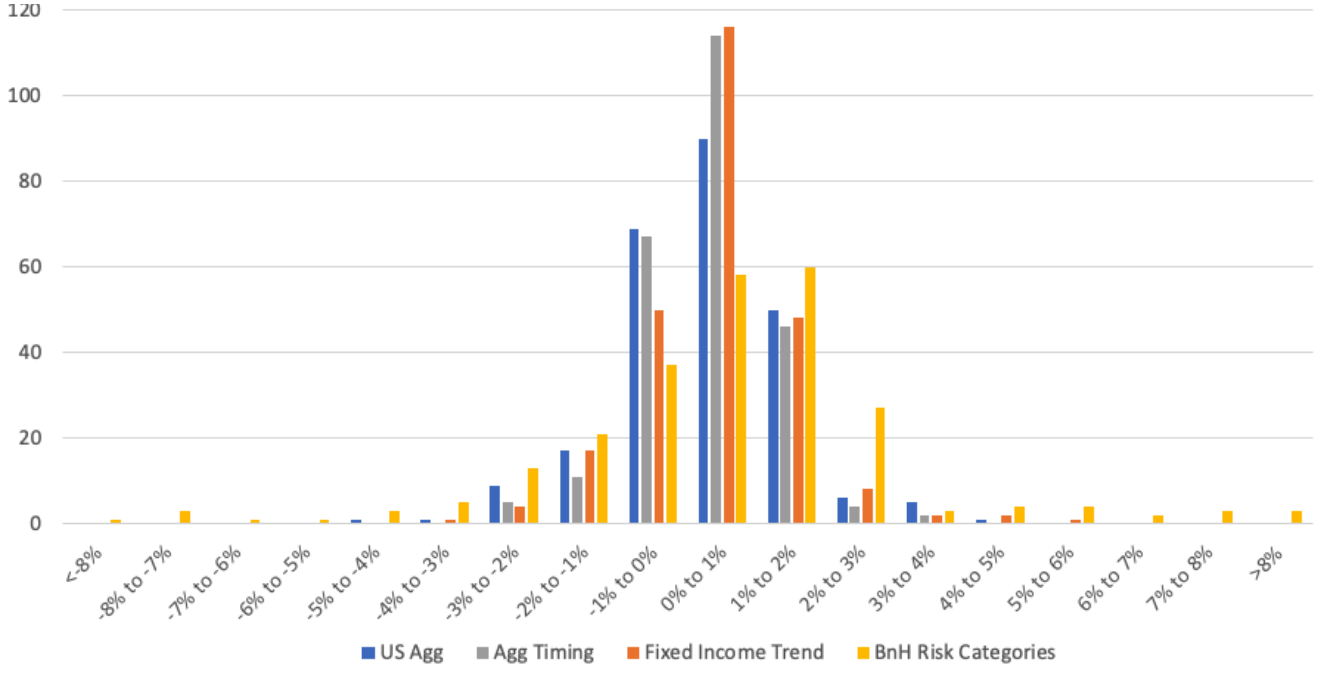
Exhibit V: Equity Curves January 2005 through September 2025



SOURCE: Bloomberg, S&P Global, Cambria. Past performance is not a guarantee or indicator of future results.

When comparing Buy-and-Hold US Agg to Agg timing, we saw that the system produced fewer instances of large gains and losses, resulting in similar returns but with an improvement in risk statistics. Looking at the monthly return distribution in Exhibit VI, we can see that the basic 200-day SMA system applied to a basket of higher-volatility (riskier) bonds (Fixed Income Trend) provided effective risk management with fewer instances of negative returns while capturing some of the upside volatility associated with them. This results in a meaningfully better overall return profile and is commonly referred to as skew in trend following. A positive skew in a strategy's return distribution, where the right tail of the distribution is longer, indicates occasional large gains and frequent small losses. This convex payoff profile is typically indicative of successful trend following strategies, allowing for upside participation while reducing downside loss.

Exhibit VI: Monthly Return Distribution January 2005 through September 2025



SOURCE: Bloomberg, S&P Global, Cambria. Past performance is not a guarantee or indicator of future results.

Examining the more detailed risk statistics in Exhibit VII helps us better understand the profile underlying the outperformance.

Exhibit VII: Historical Risk Statistics January 2005 - September 2025

	US AGG	Agg Timing	Fixed Income Trend	BnH Risk Categories
Downside Vol	2.59%	1.75%	2.03%	5.66%
Upside Vol	3.44%	2.84%	3.60%	6.95%
Downside Capture Ratio	100.00%	57.71%	28.62%	132.15%
Upside Capture Ratio	100.00%	79.08%	85.86%	160.81%
Sharpe Ratio	0.38	0.55	0.88	0.54
Sortino Ratio	0.36	0.56	0.72	0.32

SOURCE: Bloomberg, S&P Global, Cambria. Past performance is not a guarantee or indicator of future results.

While the Agg Timing model improves downside mitigation, reducing downside volatility from 2.59% to 1.75% and captured roughly half the downside of the Agg, it does so at the cost of significantly lower upside volatility and upside capture. This trade-off is influenced by volatility clustering, a phenomenon where periods of big moves tend to happen together - periods of high volatility tend to be followed by periods of high volatility, and periods of low volatility tend to be followed by periods of low volatility.

In such environments, trend-following models like Agg Timing that are 100% invested or 100% in cash may exit positions during heightened volatility to mitigate risk. However, because markets can rebound sharply after downturns, these models might remain sidelined during the initial recovery phase, thereby missing out on some of the early gains. This behavior results in a lower upside capture ratio, as the strategy prioritizes risk avoidance over immediate participation in volatile upswings.

The Fixed Income Trend strategy, however, delivered a more compelling risk-return profile. It captured just 28.62% of US Agg's downside while retaining 85.86% of the upside, resulting in the highest Sharpe ratio (0.88) and Sortino ratio (0.72) of the three strategies.

These results offer deeper insight into a trend-based approach that includes a more expansive set of bond categories, and its potential to enhance fixed income exposure by preserving return potential one might expect from something like the US Agg, while substantially reducing downside risk.

A key factor to this performance is the strategy's ability to invest across a broader array of fixed-income segments that tend to exhibit lower correlations with each other. This diversification reduces the impact of volatility clustering by allocating assets among various fixed-income segments that do not necessarily move in tandem. As a result, the strategy has more opportunity to mitigate the effects of volatility, potentially leading to a smoother return profile than the Buy-and-Hold Agg approach.

What began as a simple question - *For an asset that is meant to represent a defensive allocation, is there a way to reduce the large drawdowns?* – brought us to a compelling answer.

Bonds may not rival stocks for excitement. But a disciplined, systematic approach to the asset class may offer something arguably more valuable: consistent performance, rooted in risk management. It's a strategy grounded in prudence, not hype, designed to offer improvements in a corner of the investment universe that deserves far more attention than it gets.

Appendix A

The risk bond categories and their respective indices can be seen below.

Exhibit VIII: Index

Risk Bond Categories	Index Name
Corporates	Bloomberg U.S. Corporate Investment Grade
High-Yield Corporates	Bloomberg U.S. Corporate High Yield Bond Total Return Index
Long-Term Treasuries	Bloomberg U.S. Long Treasury Total Return Index

The system rules remain consistent with those previously outlined and the position sizing was adjusted to a 33% weight per risk bond category. If a risk bond category index price was below its 200-day SMA at the end of the month, its 33% allocation was invested in T-Bills, otherwise the system was invested in the bond category. We refer to the updated simulation as Fixed Income Trend (3) in the exhibits.

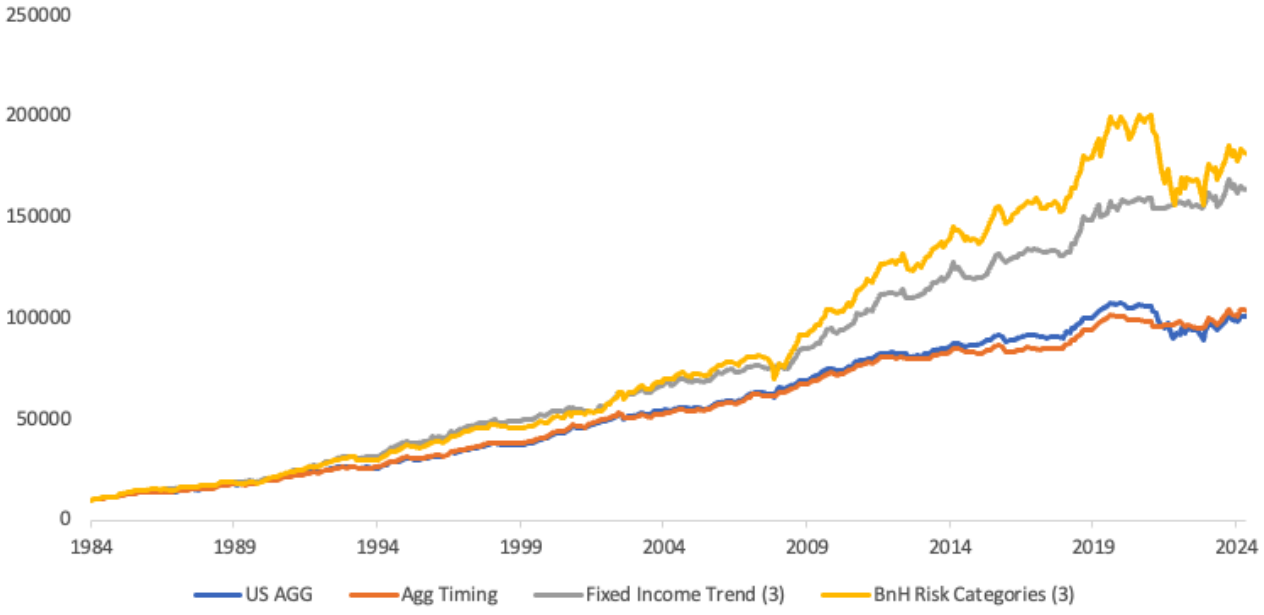
Exhibit IX contains the risk and return statistics for Buy-and-Hold Agg, Agg Timing system, the Fixed Income Trend system, and Buy and Hold risk bonds from January 1985 through March 2025.

Exhibit IX: Return and Risk Statistics January 1985 – September 2025

	US AGG	Agg Timing	Fixed Income Trend (3)	BnH Risk Categories (3)
Annual Return	5.92%	6.00%	7.22%	7.49%
Volatility	4.41%	3.79%	5.06%	6.54%
Sharpe	0.62	0.73	0.78	0.66
Max Drawdown	-17.18%	-6.56%	-5.94%	-22.04%
Skew	-0.11	0.13	0.07	-0.29

SOURCE: Bloomberg, S&P Global, Cambria. Past performance is not a guarantee or indicator of future results.

Exhibit X: Equity Curves January 1985 through September 2025



SOURCE: Bloomberg, S&P Global, Cambria. Past performance is not a guarantee or indicator of future results.

To Illustrate the impact zero interest rate policy "ZIRP" had we also included the return and risk statistics for the 3 Cat model over the abbreviated period below used in the 4 category simulation.

Exhibit XI: Return and Risk Statistics January 2005 – September 2025

	US AGG	Agg Timing	Fixed Income Trend (3)	Fixed Income Trend (4)
Annual Return	3.20%	3.40%	4.59%	5.07%
Volatility	4.20%	3.19%	4.52%	3.87%
Sharpe	0.38	0.55	0.65	0.88
Max Drawdown	-17.18%	-7.56%	-5.94%	-4.63%
Skew	-0.17	0.10	-0.02	0.40

SOURCE: Bloomberg, S&P Global, Cambria. Past performance is not a guarantee or indicator of future results.

DISCLOSURES

Use of Third-Party Information: Certain information contained herein has been obtained from third-party sources, and such information has not been independently verified by Cambria. No representation, warranty, or undertaking, expressed or implied, is given to the accuracy or completeness of such information by Cambria or any other person. While such sources are believed to be reliable, Cambria does not assume any responsibility for the accuracy or completeness of such information. Cambria does not undertake any obligation to update the information contained herein as of any future date.

Currentness: Except where otherwise indicated, the information contained in this presentation is based on matters as they exist as of the date of preparation of such material and not as of the date of distribution or any future date. Recipients should not rely on this material in making any future investment decision. Past Performance: There is no guarantee that the investment objectives will be achieved. Moreover, the past performance is not a guarantee or indicator of future results.

Benchmarks: Any indices and other financial benchmarks shown are provided for illustrative purposes only, are unmanaged, reflect reinvestment of income and dividends and do not reflect the impact of advisory fees. Investors cannot invest directly in an index.

Forward-Looking Statements: Certain information contained herein constitutes "forward-looking statements," which can be identified by the use of forward-looking terminology such as "may," "will," "should," "expect," "anticipate," "project," "estimate," "intend," "continue," or "believe," or the negatives thereof or other variations thereon or comparable terminology. Due to various risks and uncertainties, actual events, results or actual performance may differ materially from those reflected or contemplated in such forward-looking statements. Nothing contained herein may be relied upon as a guarantee, promise, assurance or a representation as to the future.

Registration Status: SEC registration does not imply a certain level of skill or training

DEFINITIONS:

Bloomberg US Aggregate Bond Index (aka 'Agg'): Broad base, market capitalization-weighted bond market index representing intermediate-term investment-grade bonds traded in the U.S.

Treasury Bills (aka T-Bills): Short-term U.S. government debt obligation backed by the Treasury Department with a maturity of one year or less.

Convertible Bonds (aka Convertibles): A hybrid of straight corporate bonds and common stock. Like a corporate bond, convertible bonds offer the investor a guaranteed income in the form of interest while giving the investor the option to convert the bond to common stock at their discretion.

High-Yield Bonds (aka Junk Bonds): Bonds that pay higher interest rates because they have lower credit ratings than investment-grade bonds. High-Yield Bonds are more likely to default, so they typically pay higher yields.

Preferred stock (aka Preferreds): A hybrid security that blends characteristics of both stocks and bonds. Preferred stocks typically provide investors with fixed dividend payments, granting them priority over common stockholders in dividend distributions and asset claims in the event of liquidation. Due to their fixed dividends and seniority over common shares, preferred stocks typically offer higher yields than traditional investment-grade bonds, albeit with increased credit risk and market sensitivity.

Volatility: The degree of variation in the price of a financial asset over time. It is a statistical measure of the asset's return dispersion and is commonly used as a proxy for risk. High volatility indicates large price swings (both upward and downward), while low volatility suggests more stable prices.

Downside Volatility: Measures the volatility of negative returns. It focuses on the potential for losses rather than overall volatility, providing a more specific measure of risk-sensitive investors. Downside volatility is computed as the square root of the downside semi-variance of the returns, which is the sum of the squares of the negative returns values divided by their count.

Upside Volatility: Measures the volatility of positive returns. It focuses on the potential for gains rather than overall volatility. Upside volatility is computed as the square root of upside semi-variance of the returns, which is the sum of the squares of the positive return values divided by their count.

Downside Capture Ratio: A measure of how well a portfolio performs during periods when its benchmark index is experiencing negative returns. It compares the portfolio's returns to the benchmark's returns in down markets. A downside capture ratio of less than 100% indicates that the fund lost less than the index during the months the index had a negative return.

Upside Capture Ratio: A measure of how well a portfolio performs during periods when its benchmark index is experiencing positive returns. It compares the portfolio's returns to the benchmark's returns in up markets. An upside capture ratio greater than 100% indicates that the fund has generally returned more than the index during periods of positive returns for the index.

Sharpe Ratio: A measure of risk-adjusted return, indicating how much excess return an investment generates for each unit of risk taken. It's calculated by dividing the excess return of an investment (its return minus the risk-free rate) by its standard deviation (a measure of risk). A higher Sharpe ratio generally suggests a better risk-adjusted return, meaning the investment generates more return for each unit of risk.

Sortino Ratio: A measure of risk-adjusted return that focuses on downside risk, unlike the Sharpe Ratio which considers both upside and downside volatility. It's calculated by subtracting the risk-free rate from the investment's return and dividing the result by the downside deviation. A higher Sortino Ratio indicates a more favorable risk-adjusted return, meaning the investment provides a higher return per unit of downside risk.

Skew: A statistical measure that refers to asymmetry in a probability distribution, indicating whether a market is expected to have more extreme positive or negative outcomes.

Duration: measure of a bond's sensitivity to changes in interest rates.

Credit Risk: The risk that a bond issuer or borrower will fail to make required payments of interest or principal on time, leading to financial loss for the investor or lender. It reflects the likelihood of default and directly influences the yield and price of a bond.

INDICES:

Bloomberg US Aggregate Bond Total Return Index: The Bloomberg US Aggregate Bond Index is a broad-based flagship benchmark that measures the investment-grade, US dollar-denominated, fixed-rate taxable bond market. The index includes Treasuries, government-related and corporate securities, fixed-rate agency MBS, ABS, and CMBS (agency and non-agency), provided the necessary inclusion rules are met.

Bloomberg U.S. Convertibles Liquid Bond Total Return Index: The Bloomberg US Convertibles Liquid Bond Index tracks the performance of USD-denominated convertible securities with a minimum issued amount of $350mn and a minimum outstanding amount of $250mn.

Bloomberg U.S. Corporate High Yield Bond Total Return Index: The Bloomberg US Corporate High Yield Bond Index measures the USD-denominated, high yield, fixed-rate corporate bond market. Securities are classified as high yield if the middle rating of Moody's, Fitch, and S&P is Ba1/BB+/BB+ or below. Bonds from issuers with an emerging markets country of risk, based on Bloomberg EM country definition, are excluded
S&P U.S. Preferred Stock Total Return Index: The S&P U.S. Preferred Stock Index is designed to measure the performance of the U.S. preferred stock market. Preferred stocks are a class of capital stock that pays dividends at a specified rate and has a preference over common stock in dividend payments and asset liquidations.

Bloomberg U.S. Long Treasury Total Return Index: The Bloomberg US Treasury: Long Index measures US dollar-denominated, fixed-rate, nominal debt issued by the US Treasury with 10 years or more to maturity.

Bloomberg U.S. Corporate Investment Grade Index: The Bloomberg US Corporate Bond Index measures the investment grade, fixed-rate, taxable corporate bond market. It includes USD denominated securities publicly issued by US and non-US industrial, utility and financial issuers. (Future Ticker: I02765US)

S&P 500 Index: The S&P 500® is widely regarded as the best single gauge of large-cap U.S. equities and serves as the foundation for a wide range of investment products. The index includes 500 leading companies and captures approximately 80% coverage of available market capitalization.