Performing on a tight rope with a safety net



ETF Research Study

April 2023



Executive Summary

This report evaluated Downside Mitigation ETFs, a category of exchange-traded funds designed to offer growth from equities while simultaneously seeking to limit downside exposure. There are now more than 160 ETFs that fit this definition. The majority of these were developed between 2018 and 2021 in response to concerns about prevailing market conditions. The market had begun to be characterized by some economists and investment strategists as "overpriced", "frothy" and "susceptible to a crash" from its relentless upswing for more than a decade after the post-financial-crisis period. This research report fully defines Downside Mitigation ETFs, examines the various risk mitigation strategies that are applied, and compares their past performance and future outlooks. Downside Mitigation ETFs are generally more suitable for conservative investors who want exposure to equities to grow their savings but are expressly vulnerable to large declines in the market. Bear markets, defined by 20% or greater peak-to-trough declines, could materially impact their well-being and standard of living. The recent stock market declines that incurred in 2022 provided a perfect test environment for these ETFs. The study found that more than half of the ETFs that were evaluated had failed to pass the test. The good news is that some of the Downside Mitigation ETFs were able to successfully meet these objectives when their investors needed them the most.

1. The Case for Downside Mitigation ETFs

The fact that historical returns from the US stock market have been positive for most ten-year periods since the depression provides little comfort for investors with limited downside cushions and shorter time horizons for preserving their nest eggs. Downside mitigation ETFs were introduced to address these realities. They are designed to achieve equity returns with a fraction of the risk.

A frequent problem is that risk, as it relates to investor risk tolerance, may be wrongly identified. Price volatility is almost universally used as a proxy for risk. This pedagogic assumption makes it for easy teaching but it can overshadow other considerations. For some investors, time horizon is the most important factor determining the extent to which they can withstand price volatility. These investors are primarily concerned with capital preservation than with capital appreciation but do not want to fully relinquish the upside potential from the markets. Downside Mitigation ETFs are designed to provide an attractive solution for these investors and perform better than traditional asset allocation.

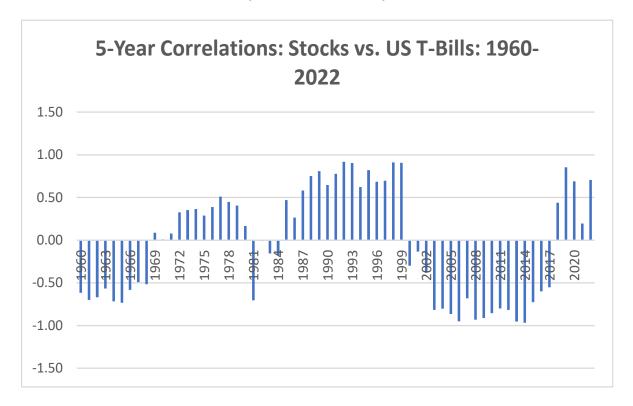
With traditional asset allocation, the underlying assumptions of most asset allocation models can be unreliable. The normal construct of an inverse correlation between bonds and equities drives much of modern-day portfolio construction. Since these correlations have held true in most time periods, this combination helps provide additional income while lowering overall portfolio volatility. However, relying entirely on historical correlations between long-term time series of investment returns has serious consequences. This reliance misses two important characteristics of financial markets:

- (1) Historical correlations can change dramatically when examining more closely defined time periods specified. For example, the correlations that existed between stocks, bonds, cash, and precious metals from 1926 through 2020 are not the same as those same correlations between 1970 and 1979 or between 2000 and 2008.
- (2) The inability to adjust to changing correlations in the current market environment. Markets are incredibly dynamic. There is no way of knowing when the past no longer is prelude to the

future and when correlations will suddenly change from negative to positive just when your core equity position turns sharply negative.

The chart below displays historic rolling five-year correlations between S&P 500 total returns and the returns of US Treasuries between 1960 and 2022. The chart clearly indicates that the expected negative correlations continued between 1960 and 1968, a strong period for the stock market. What happened since then, however, runs contrary to the premise that these correlations are normally negative.





In fact, the five-year correlations ending in each year from 1969 through 1980 were positive. The 12-year period that ended in 1980 proved not to be an aberration. These numbers turned negative for the four years from 1981-1984 but then turned positive again in 1985 and continued to be positive for each five year-period until 1999. This accounts for 15 positive years in a row. Following this cycle, the correlations returned to historical expectations of negative correlations for 18 years inclusive from 2000 through 2017. Beginning in 2018, these correlations turned positive again. Specifically returns for both the S&P 500 Index and US Treasury bonds were both negative in 2018 and 2022, so traditional asset allocation failed investors in those two years. For the entire 63-year period, the correlation was negative 31 times or 49.2%. Therefore, the rule of negative correlations between stocks and bonds has not held true for the US stock market going as far back as 1960.

The other take-away from the past 50 years is that when a long period of negative correlations end, the ensuing period of positive correlations has tended to last a decade or more. 2022 was only the fifth year of the current positive correlation regime. The longer this continues, the longer allocating 40% of total investments to I bonds fails to be a solution to overall portfolio downside risk mitigation.

2. Definition and Design of Downside Mitigation ETFs

If ratcheting up bond allocation doesn't help protect vulnerable investors from huge downturns, what are the alternatives? A growing category of Downside Mitigation ETFs are designed to offer investors growth from equities while simultaneously seeking to limit downside exposure. The category is also known as "Defined Outcome" and "Risk Managed". The authors of this report consider Downside Mitigation to be the most accurate characterization in terms of how these ETFs are designed and based on their stated objectives.

The disclosed trade-off is that upside exposure will be somewhat limited so as to protect the downside risk. A number of the strategies now used by Downside Mitigation ETFs have been successfully used by hedge funds for decades albeit in opaque and expensive qualified-investor covenants. To the extent that ETFs have democratized institutional strategies and made them available to all investors, they are now doing the same with hedge fund strategies. Specifically, this study features downside risk mitigation strategies used by hedge funds for years but without the risks associated with swaps and other strategies classified as hybrid or alternative.

Many but not all of these ETFs use exchange-traded derivatives to achieve their objectives. Some use algorithms designed to identify especially risky market environments when exposure to more volatile and high-beta equities should be reduced. In a few of these ETFs, negative positions to the market using listed futures may be taken in such environments.

ETFs we classify as Downside Mitigation have disclosed strategies to explicitly limit downside exposure. This report distinguished these from other ETFs that tend to implicitly limit downside exposure. Some "smart beta" and actively managed ETFs have low volatility objectives that tend to lose less in down markets and gain less than the benchmark indexes in above-average years for the stock market. Since their strategies do not change in positive market environments, they were not included in the study.

There are other ETFs built to neutralize market exposure by employing long-short strategies. However, no targets are set for attempting to limit downside losses and market-neutrality may not lead to positive returns in bull market environments. For this study, long-short strategies that do not include an objective of limiting downside participation in their summary prospectus were not included.

3. Investor Suitability

Downside Mitigation ETFs are generally more suitable for conservative investors. This segment within the conservative investment category is mostly aimed at senior investors who want to grow their savings but are expressly fearful of large market declines. Bear markets, defined by 20% or greater peak-to-trough declines, threaten their capital reserves and materially impact their standard of living. Most advisory firms still recommend protecting seniors by allocating 40% of the overall capital to long-term bonds. For investors with less than 25 years life expectancy, advisors generally recommend going to 40% equity and 60% bonds or even to a more conservative 30%/70% allocation. Eventually, the recommendation might shift to 20%/80%. The problem with this strategy, as illustrated above, is that during the past 53 years, stocks have been correlated positively with equities more than half the time, thus providing little to no downside protection.

The availability of downside mitigation ETFs coupled with a rising rate environment has led many investors and advisors to rethink this strategy. If the purpose of bond allocation was to protect against downside risk associated with equities, Downside Mitigation ETFs could be a superior solution. Yet, a range of suitability exists, and the traditional allocation spectrum is helpful here. Fortunately, the range of ETFs used in this study are designed to fit that spectrum. In the next section, the study dives into ETFs that strive to provide partial protection in bear markets and full participation in bull markets. They are characterized as all-weather ETFs, intended as alternative core holdings to non-buffered equities because they are designed to produce superior return-to-unit-risk ratios over long periods of time. The study also includes ETFs that may be a better fit for the ultra-conservative investment category, a group that was created with the objectives of keeping potential bear market participation to a minimum in return for tighter limitations on potential bull market participation.

4. Comparison of ETFs in the Downside Mitigation Category

As of this publication date, there are more than 160 ETFs in the Downside Mitigation category that are listed on US exchanges. ETF Sponsors covered by this study include Amplify, ASYMmetric, Cambria: Evoke Aris, Global X, Innovator, Invesco, Nationwide, and Simplify.

Invesco offers one of the broadest selections of ETFs in the industry. Global X also has more than 100 ETFs and is recognized for offering niche products for different types of investors. Nationwide is an insurance focused long-standing fund manager that entered the ETF market nearly 10 years ago. Cambria was one of the earlier families of ETFs to use fully transparent active management along with strategies that use derivatives. ASYMmetric, Evoke Aris, Innovator, and Simplify all have less than five years in the marketplace and were created specifically to offer products that fit into the Downside Mitigation category.

One of the newer companies that has become dominant in both the number of products as well as assets under management (AUM) is Innovator ETFs. The reason for so many products is that each of their funds is managed for a particular month-beginning and month-ending 12-month period. Accordingly, they have 12 funds for each of their seven Defined Outcome series to meet a variety of return, risk and income objectives by using asset classes ranging beyond large cap US equities. Innovator refers to their family as Defined Outcome ETFs. The first three of these debuted in August 2018.

To frame the overall competitive landscape, we selected the ETFs from each of the provider's offerings that were the most conservative of the US large market capitalization strategies offered. To choose ETFs within families we selected those with the largest level of AUM.

ASPY, ASYMmetric Smart S&P 500 ETF, is an indexed and rules-based strategy designed to deliver S&P 500 returns with a fraction of the risk over a full market cycle. The index is built to systematize and emulate an actively managed hedge fund with similar objectives. The fund seeks to produce these results by dynamically reducing portfolio risk or exposure as S&P 500 risk increases. The strategy aims to provide protection against bear market losses, by being net short, and to capture the majority of bull market gains, by being net long, with respect to exposure to the S&P 500® Index. The strategy is powered by ASYMmetric Risk Management Technology™, intellectual property that uses price-based algorithms to accurately measure market risk.

BJAN, Innovator U.S. Equity Buffer ETF, is an actively managed fund that uses options in an effort to moderate losses on the S&P 500 over a one-year period starting each January. The fund foregoes some of the upside return as well as the S&P 500's dividend component because the options are written on the price (not total) return version of the index. In exchange for preventing realization of the first 9% of the S&P 500's losses, investors forego upside participation above a certain threshold, which is reset annually. Investors who buy at any other time than the annual reset day may have a very different protection and buffer zone. The issuer publishes effective interim levels daily on its website. The fund must be held to the end of the period to achieve the intended results. The targeted buffers and caps do not include the fund's expense ratio. The fund is actively managed, resets annually, and uses listed options exclusively. Innovator has 11 clone funds: **BFEB**, **BMAR**, **BAPR**, etc. to accommodate investors who want to invest on the first day of other months and wish to lock in the same kind of protection.

NUSI, Nationwide Nasdaq-100 Risk-Managed Income ETF, is an actively managed portfolio of stocks that are among those included in the Nasdaq-100 Index and an options collar. Per index rules, the fund only invests in the top 100 largest by market cap, non-financial stocks listed on NASDAQ. A collar strategy involves selling or writing call options and buying put options, thus generating income to hedge some downside risk. The fund's manager utilizes a proprietary, systematic model to manage the Fund's options positions, yet it is not tied to specific upside or downside thresholds. The strategy seeks to generate high current income on a monthly basis from any dividends received from the underlying stock and the option premiums retained.

PHDG, Invesco S&P 500 Downside Hedged ETF, is an actively managed ETF that offers exposure to S&P 500 stocks with a big difference. The fund aims to stave off the impact of huge market downturns by holding a substantial position in VIX futures. The downside is that maintaining VIX futures exposure over time is expensive. This ETF will likely outperform when the market tanks but consistently lag when markets behave more normally. **PHDG** is one of the oldest funds in this category having debuted in 2012.

RPAR, the Risk Parity ETF, is actively managed yet nonetheless aims to align its exposure to an index, the Advanced Research Risk Parity Index. Risk parity is a strategy that seeks multi-asset class diversification to ensure good performance in virtually any macroeconomic environment. In order to approximate this strategy, the index diversifies across four asset classes: TIPS, US Treasury Bonds, global equities, and commodities. It seeks returns similar to global equities with lower standard deviation over time. It is sponsored by LA-based hedge fund provider Evoke Aris.

SPD, the Simplify US Equity PLUS Downside Convexity ETF, owns S&P 500 ETFs but can have up to 20% of its portfolio in put options as warranted by market conditions according to its decision rules. **SPD** aims to deliver simple convexity without the complexity of buffered ETFs. The fund is actively managed and seeks capital appreciation by investing the bulk of portfolio assets in ETFs providing exposure to the S&P 500 Index combined with a modest allocation in a put option overlay. The option strategy is designed to provide downside protection without capping any upside participation, or in other words, creates downside convexity in the fund. The specific put option contracts are selected strategically based on the adviser's evaluation of relative value, strike price and maturity. Investors should anticipate a non-linear relationship between the fund's return and market returns. Meaning, by exercising put options, the fund adviser expects the fund's return to fall

less than the market. It should be noted that the fund's goal of protection against losses is not quaranteed.

SWAN, the Amplify Black Swan ETF, is designed to participate in 30% of S&P 500 returns by holding laddered 10-Year Treasury Bonds and using the income to purchase long-dated call options on the S&P 500. **SWAN** aims to provide muted equity exposure while mitigating downside risk. The fund gets its equity exposure via long-dated options (LEAPS) on **SPY**, the mega-ETF tracking the S&P 500. The options specifically target 70% participation in either direction (up or down) over the market cycle. They roll in June and December. The Treasury portion provides additional downside protection, assuming that safe-haven Treasuries will rise if equity markets tank. The Treasuries are a mix of maturities aiming to reflect 10-years on aggregate and provide their own risk and return (duration and yield). **SWAN**'s asset ratio is fixed at 90% Treasurys and 10% options at each semi-annual index reset. However, the index's equity notional exposure aligns with the total index market cap, so each dollar invested aims for dollars' worth of notional equity exposure (at 70% participation) plus 90 cents of 10-year Treasurys.

TAIL, the Cambria Tail Risk ETF, is an actively managed fund that holds mostly cash and Treasuries while using the strategy of buying put options on the S&P 500 with the purpose of portfolio downside protection. It is managed by Mebane Faber's team at Cambria Asset Management. **TAIL** endeavors to invest one percent of its holdings every month in out-of-the-money put options on the S&P 500 Index. The strategy involves buying more puts when volatility is low and fewer puts when volatility is high. The main purpose behind holding these options is hedging a portfolio against significant negative movement in the value of US equities, commonly referred to as tail risk. The Cambria team intends to target options that are 0 to 30% out of the money. Buying puts further out of the money reduces the price tag of this hedge, but also lessens the amount of downside protection that is provided.

5. Year 2022 - Putting Theory to the Test

The year 2022 represented the sharpest annual decline suffered by the S&P 500 Index since the financial crisis in 2008. Virtually all negative factors that could potentially worry investors, in what began the year as a grossly overvalued market by historical standards, were in action. These include:

- Huge spike in energy prices fueled by Russia's war in the Ukraine
- Geopolitical unrest aggravating supply chain issues
- Greater-than-anticipated spikes in inflation
- Negative earnings guidance and reports by some of America's largest companies
- Inflation "sticker shock" has consumers reducing discretionary purchases
- Fears of recession and not to miss the cyclical earnings season
- Hawkish Fed raising rates
- Steepest inversion of the yield curve in the past 50 years
- Declining GDP numbers confirming a technical recession
- Anticipated tax and spending increases.

Amidst all this turmoil, SPY, the S&P 500 ETF Trust suffered a loss of 18.17% in calendar year 2022. Investors were forewarned that Downside Mitigation ETFs would underperform in strongly positive years for the stock market. However, they had every right to expect substantially less of a drawdown than SPY in a year such as 2022. The table below provides calendar year 2022 price changes alongside multiple-year return periods for each of the eight ETFs covered in the study:

Table: Performance Comparisons of Downside Mitigation ETFs

Ticker	2022	2-Year	3-Year	10-Year	Standard Deviation	Sharpe Ratio
ASPY	-10.94%	+2.47%*	+1.67%*	+11.41%*	16.1	0.71
BJAN	-11.40%	+0.44%	+4.32%	N/A	15.1	0.29
NUSI	-28.35%	-14.30%	+1.18%	N/A	15.3	0.08
PHDG	-14.09%	-0.31%	+5.75%	+4.14%	11.3	0.37
RPAR	-22.80%	-8.88%	-0.29%	N/A	16.0	-0.02
SPD	-25.96%	-18.52%	N/A	N/A	N/A	0.10
SWAN	-27.78%	-16.97%	-0.63%	N/A	12.8	-0.05
TAIL	-13.13%	-12.80%	-6.92%	N/A	11.9	-0.58
SPY	-18.17%	+2.64%	+7.64%	+11.84%	20.7	0.57

^{*} Index performance used as proxy for ETF performance

By analyzing the returns for the eight ETFs and comparing them with **SPY**, it is evident that some of the ETFs did not protect their investors from full participation in the downturn. In fact, four of the ETFs lost substantially more than the S&P 500 in 2022. These include: **NUSI**; **RPAR**; **SPD** and **SWAN**. All four failed the test as defined by their objective functions. A fifth, **TAIL**, saved investors 25% of **SPY**'s total drawdown in 2022, -13.5% as compared with -18%. On the other hand, it performed so poorly in 2021, a double-digit loss in a year that **SPY** gained more than 28%, that its two-year annualized return was more than 1000 basis points (10.16%) worse than **SPY**. Investors expect to sacrifice upside so that even 5% to 10% would be acceptable in a year that **SPY** posted superior returns. A double-digit loss in a positive year, exactly what investors in **TAIL** wanted to avoid is unacceptable. Thus, **TAIL** failed the combined 2021-2022 test. This leaves **ASPY**, **BJAN** and **PHDG** are the only three ETFs in the group that gave investors what they expected, downside risk mitigation when the markets did poorly. That is why the table above shows **ASPY**, **BJAN** and **PHDG** in green while the five failed ETFs are shown in red. For comparison **SPY**, representing the benchmark, is shown in black.

Comparing the three ETFs that passed the test, **ASPY** did the best job in the study both in 2022 and on a two-year basis including 2021 and 2022. It had the lowest drawdown in 2022 and the two-year return was the closest of the downside mitigation to that of **SPY**.

On a three-year basis, the results tell a different story, **BJAN** and **PHDG** outperformed market-signal-reliant **ASPY** as the March Covid-related plummet followed by the bull market that prevailed during the

remainder of 2020 shifted technical signals back and forth. For the volatile three-year period, **PHDG** performed best, returning 5.75% in comparison to 4.32% for **BJAN** and just 1.67% for **ASPY**.

PHDG. For the long-term period, the index used for ASPY shows it to be an all-weather strategy, returning an annualized 11.41% just 43 basis points less than the 11.84% returned by the S&P 500 with a much lower standard deviation. As a result, ASPY has a superior Sharpe Ratio for the 10-year period to SPY, 0.71 as compared with 0.57. For those with shorter time horizons who has avoiding drawdowns as #1 priority with limited participation on the upside, the options-collar strategy pursued by PHDG is worthy of consideration. It had the lowest standard deviation of any of the eight strategies. However, with an annualized return of just 4.1%, PHDG only captured 35% of SPY's upside for the 10-year period while ASPY secured a 96% capture ratio for the same period. Since BJAN is actively managed, there was no index available to include it for the 10-year comparisons. Nevertheless, on the basis of comparisons since inception, BJAN deserves consideration alongside ASPY and PHDG as Downside Mitigation ETFs for conservative investors that actually provide downside protection during major market downturns.

Why did the other five ETFs, **NUSI**, **RPAR**, **SPD**, **SWAN** and **TAIL**, fail to provide protection when it was needed most? Scrutiny of the methodology of all five of these ETFs reveal the fact that 10-Year or 30-Year Treasury bonds are used as a "safe haven" within the strategy. Confronted with an environment where fixed income ETFs and mutual funds posted double digit losses, the strategies failed. None of the five fund disciplines took into account that while government securities have no credit and/or quality risk, long-term Treasury bonds have quite a bit of duration risk in a rapidly rising interest rate environment.

This leaves just three reasonable choices from the eight ETFs in the study for Downside Mitigation: **ASPY**, **BJAN**, and **PHDG**. For investors looking to preserve the long-term upside that an investor would expect from **SPY** that also provides dependable downside risk mitigation, **ASPY** rates a slight edge over **BJAN**. This is with the caveat that results will depend on the time period measured. For example, in the three-year period including 2020, **PHDG** would have been the best place to be. However, as we have seen, its tight collar limits participation on the upside.

A glance at the peripherals associated with ETFs reveals that the tightest average trading spread belongs to BJAN with 0.23%. ASPY is just a bit wide at 0.28% while the spread on PHDG is 0.38%. PHDG is by far the least expensive of the three as compared with 0.79% for BJAN and 0.95% for ASPY. In terms of investing with dollar average contributions on a bi-weekly basis, logistics get somewhat complicated with BJAN. It is only for Investors who put money in the fund during January that management can make best efforts to cut off annual losses at 9%. It is recommended that February contributions go to BFEB and March contributions got to BMAR, etc. Having 12 ETFs rather than 1 as the US core equity option in the portfolio could get to be a bit more complicated than some investors would prefer. From that perspective, ASPY is the best and simplest all-weather alternative for owning the market and mitigating downside risk while ultra-conservative investors who do not trade should find solace with PHDG.

6. Conclusion

Whether one uses the label "Defined Outcome", "All-Weather" or "Risk Managed", the objective of ETFs using these labels is always mitigating downside risk. Hence, this report defines ETFs in this category as Downside Mitigation ETFs. Eight such ETFs (no more than one from any sponsor) were selected for the study. The concept implies that these are ETFs that will protect investors when the market posts double-digit negative returns. The year 2022 was the perfect test for such ETFs. Unfortunately for their investors, five of the eight ETFs in the study failed to pass the test. NUSI, RPAR, SPD and SWAN all had methodologies that included long positions in US Treasury Bonds as safe harbors albeit within differently formulated strategies. With most long Treasury bond funds going down double digits while the stock market was doing the same, this became a double whammy. The result is that all four of these ETFs had returns of -22.8% or lower. The range was between 4.0% and 10.0% of underperformance when the SPY returned -18.2%. The bottom line is that investors believed they had limited upside participation in exchange for downside protection but did not get the latter. All four failed the 2022 test. TAIL, actively managed with allocations to several alternative asset classes, did manage to post a 2022 return that was less negative than that of SPY. However, its 2021 return was so abysmal that for the two-year period of 2021 and 2022 it was down 10.0% more than SPY.

There were only three ETFs that passed the test: **ASPY**, **BJAN** and **PHDG**. Among the three, **ASPY** performed the best in the 1- and 2-year periods ending December 31, 2022 while **PHDG** and **BJAN** both fared better in the three-year period. **BJAN**, the January ETF in a series that has one for every calendar month, also performed well in a strong 2019 for **SPY**. Since **BJAN** did not exist in 2018 and it is actively managed, we have no information on how it would have performed during that down year or in the preceding six mostly positive years.

For a long-term view, 10-year return histories were only available for **ASPY**'s index and **PHDG** to compare with **SPY. PHDG** performed exactly as expected for investors that put downside protection above full participation in upside returns. It had the lowest price volatility and kept declines at a minimum while capturing 35% of the returns realized by **SPY.** For long-term investors looking for a core long-term holding, **ASPY**'s hybrid performance was outstanding. Its standard deviation was considerably less than that of the S&P while capturing 96% of **SPY**'s return. The differential was a mere 43 basis points. As a result, **ASPY** finished the 10-year period with a Sharpe Ratio, a measure of return-per-unit-risk, of 0.71 as compared with 0.57 for **SPY**, a substantive difference. The bottom line for investors seeking ETFs to mitigate losses when the markets tank but still provide upside potential is that the three ETFs: **ASPY**, **BJAN** and **PHDG** were able to successfully meet these objectives when investors needed them the most.

By Herbert Blank, Eugene Yeboah PhD, and Richard Greene, Global Finesse, April 2023.

Inquiries?

Phone: +1 (860) 819-3700 Hartford

+1 (212) 537-5773 New York

Email: h.blank@globalfinesse.com

e.yeboah@globalfinesse.com r.greene@globalfinesse.com

Global Finesse is an independent firm providing research-based consulting services by industry-recognized experts in the application of financial technology, data, and analytics to help generate new sources of alpha, improve risk management, and launch innovative products.



Hartford, CT ♦ New York, NY www.globalfinesse.com

Disclaimer

This study was commissioned on behalf of ASYMmetric ETFs LLC and is intended for educational and informational purposes only and does not constitute a recommendation, investment, or legal advice. Global Finesse is a consulting firm specializing in the application of financial technology, data, and analytics; however, it is not a Registered Investment Advisor. The study is based on data acquired from independent sources believed but not guaranteed to be accurate. Therefore, nothing herein should be construed as advice to buy and sell securities. Past performance may not be indicative of future results. Readers should consult their investment, fiduciary, and/or legal advisors for guidance in making investment or business decisions.