



Adaptive Wealth Strategies

U.S. Risk Management Index

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Overview

Our Adaptive Wealth Strategies U.S. Risk Management Index employs four technical indicators to dictate the percentage equity exposure we own at any given time. The underlying indicators utilize trend-following, behavioral, and technical aspects that have academically sound investment philosophies and significant historical advantages designed with the goal of reducing risk. Our concept employs a moving average, drawdown, MACD, and volatility as indicators to move between equity and fixed income exposure. Each indicator receives an equal vote in the strategy. The end goals of the strategy are to remain invested in equities as much as possible, achieve a low tracking-error, have minimal internal expenses, provide significant downside protection, while still producing alpha generation.

Academic History of the Indicators

The first indicator, moving averages, was one of the earliest innovations in the investment profession. The starting framework was developed by statisticians in the early 1900s for time series analysis and was applied to financial instruments in the early 1960s by Pete Hauran. While that is far from modern, the idea that moving averages can be used to show trends is as applicable today as it was 60 years ago. We believe this indicator helps to provide both stability and downside protection inside our risk management strategy. The 200-day moving average is used as the indicator. We applied a standardized percent below level, when if tripped, this indicator will vote to exit equity exposure.

The second indicator, drawdown, has its roots in the behavioral side of investing which got its start as a field in 1979 with Daniel Kahneman's and Amos Tversky's Prospect Theory: A Study of Decision Making Under Risk. Once a downturn has started it can create panic within investors causing them to sell their assets further increasing the drawdown. We set a standardized drawdown level; when if reached will trigger a vote to exit equity exposure. Conversely, once a major drawdown has occurred the market can be looked at as oversold. Utilizing this indicator provides our strategy with principle protection and the ability to capitalize on what could be an oversold market. The drawdown indicator has a standardized level, when triggered will vote to exit equity exposure.

The third indicator in our strategy, MACD (moving average advance decline), is a common momentum indicator developed by Gerald Appel in the late 1970s. In 1997, Mark Carhart expanded on research done by Eugene Fama and Kenneth French on their three-factor model of stock returns and added a fourth factor to their research: momentum. MACD is one of the shortest-term momentum indicators used in practice and is used in the index to provide a quick response when trends change. We think of momentum as the herd mentality. A price move higher, typically leads to additional price moves higher, and the converse is also true, lower prices tend to lead to

lower prices. This means that a momentum indicator like the MACD can be used within a risk management strategy as an exit to avoid large downside moves and as an entry to capture large upside moves. As with our other indicators we set a standardized exit point, which will trigger a vote to exit equities when reached. MACD has also been standardized by utilizing the current price so as to make the data series more relevant through time.

The final indicator in our strategy, volatility, is being measured by the CBOE® Volatility Index (VIX®). The VIX® has its origins in the research of Menachem Brenner and Dan Galai starting with a series of papers in 1989 that proposed the creation of a volatility index derived from futures and options pricing. In 1992, the CBOE® began using this work to calculate the VIX®. The VIX® rises with uncertainty in the market which can raise the probability of large downside moves. Within our strategy, the VIX® serves as a forward-looking indicator allowing us to remove risk when uncertainty becomes too high. The index has a standardized exit point, which will trigger a vote to exit equities when reached.

Index Construction – Why did we do it?

Since 1980, Carroll Financial has built our business by focusing on one thing: the best interest of the client. Founder and CEO Larry Carroll created and instilled the idea that, “The best interest of the client is the only interest that matters.”™ As an independent firm, we have always taken pride in our investment management philosophy. We strive for customization, consistency, and simplicity. Over the years, we have delved into a multitude of products and strategies, striving to find what is best for our clients. Through those products, clients have experienced capital gains distributions from mutual funds, large tracking-error from active management, and zero-alpha from purely passive vehicles. Despite those hurdles, and regardless of vehicle, our risk management philosophy and mean-reversion strategy of targeting longer trends in the market prevailed.

We recognized we could enhance our equity reduction strategy through tax efficiency by placing the strategy inside the ETF wrapper. By moving from equities to treasuries, with the goal of reducing risk, the ETF vehicle virtually eliminates capital gains issues faced when we needed to trim equity exposure. And with that thought, the Adaptive Wealth Strategies U.S. Risk Management Index was born.

Our goal from the beginning has been to design a low-cost, tax-efficient, risk management, and alpha-generating strategy for our clients. The simplistic and common-sense origins of our model have not only worked but is easy to understand and discuss with clients. The performance and risk metrics speak for themselves. We did not over-engineer or design this to have the most impressive back test. We built it with really two main goals, remain invested as much as possible, and reduce drawdown risk. This is not something a Ph.D. created on a research desk; it was designed by advisors and portfolio managers to use inside real client accounts. The strategy was designed to be understood by both the advisor and the client. The development goal driven with the best interest of our existing clients.

Index Methodology – How did we build it?

Over the past several years, we have witnessed the rapid development and launch of many “black-box risk models.” We’ve looked under the hood at many of them and found the methodologies to be very complex and the initial goal hard to decipher. Some of them appear more like technical-soup than an actual common sense strategy. So to answer, “How did we build it?” We built the index with the client in mind, and designed a strategy linked to common technical and behavioral indicators.

We took the indicators which we have already discussed: moving averages, drawdown, MACD, and volatility, and simply looked at how they collectively can confirm periods of heightened risk. All of the indicators were statistically standardized and given z-scores for entry and exit triggers. The z-score methodology allows the

strategy to be dynamic and adapt to new information and different market cycles. The end methodology gives each indicator an equal vote on exiting the equity markets. It takes three votes to exit, and two votes to enter. Our methodology makes it harder to exit, thus likely reducing the potential for false signals.

Why give each indicator an equal vote? This hits at the heart of our philosophy: simplicity. Technical or behavior indicators do not work independently all the time, thus we look for a confirmation of signals to define an entry or exit of the equity markets rather than rely on one overriding signal. We can all point to times when moving averages became too far stretched to the upside proving little protection when the equity markets start to fall. What happened? Equities fell meaningfully before any protection was offered. The same can be said of volatility, sometimes it produces a false signal to exit or enter equity markets and can be misleading. Our goal is to rely on a combination of three out of four votes to exit the equity market, and two votes to re-enter. While not foolproof, it is a commonsense strategy that attempts to follow basic investment principals; remain invested and reduce risk if appropriate. That is exactly what we tried to build.

While thinking through the construction of the strategy, we also knew we did not want to overthink the equity or fixed income exposure. The index rotates between a cap-weighted basket of the largest 500 U.S. listed companies for the equity exposure, and short-term treasuries for the risk-off fixed income. The goal was to let the indicators be the driver of potential alpha and not our choice of underlying equity exposure. We feel the simple solution can be an optimal solution.

In addition to exiting equity exposure early to avoid drawdowns, we also implemented an approach designed to take advantage of extreme drawdown points. We implement large standard deviation events in all variables as an additional re-entry trigger point with the goal of buying at very depressed prices when trends possibly start to change to a positive direction. If the goal is to remain invested as much as possible, often the best times to re-enter the market are after large drawdowns and extreme volatility. We know it is difficult to make that decision in the moment, which is why relying on rules and a confirmation-based voting approach can be so valuable. By always allowing at least two signals to trip on the re-entry, the strategy has avoided relying on anyone methodology to be the driving decision force.

There is one last minor item to mention. When a signal is given to enter or exit the market, that signal is in affect for a minimum of ten days. The goal here is to avoid a whipsawing effect of trend changes. We've found that anything shorter triggers significantly higher trading, which has the potential to drive costs higher.

Index Performance – Has it worked?

We can assuredly say that we would not have launched an index if it did not work. By work, we also do not mean simply in a sterile laboratory back-test; we mean inside an actual client portfolio. We want to be clear, past performance is certainly not indicative of future returns. However, this is a commonsense approach that learns from history, applies a layer of creativity, and can be adaptive to what the future may hold.

To find the full index results of the Adaptive Wealth Strategies U.S. Risk Management Index, please reference our website. While returns are certainly one area of focus, we always recommend looking through the lens of downside risk. One key item we want to emphasize to advisors is the historic monthly drawdown -15.7% vs. -51.44% for the S&P 500. This metric is can be very appealing to advisors as a risk management tool and to protect the relationship with the end client. From our experience, retail clients always focus more on the losses than on the gains. This strategy has the potential to mitigate downside losses while participating in much of the upside.

Investment Use in a Portfolio

For starters, we can tell you how we use it. This strategy serves as part of the core U.S. Large Cap Equity allocation in client portfolios. This would typically represent anywhere from 10-20% of the U.S. Equity allocation within an account. We use this as part of equity exposure that is looked at to sell first when risk reduction is required. Since this risk reduction is done inside an ETF vehicle, the tax implications are significantly limited. We will also hold factor-based equity exposure along with smaller satellite positions that are more thematic and have higher tracking error to the benchmark. Whether it is a small-cap strategy, sector investment, or thematic allocation, we feel more confident in making those tactical decisions knowing that we have a risk management allocation to our Adaptive U.S. Risk Management Index. We would be happy to discuss our thoughts and illustrate how to include it in a current portfolio.

Index Architects – Who are the people behind the index?

The minds behind the index are Kristopher Carroll and Patrick Bobbins. Both of these individuals have worked at a Charlotte-based Registered Investment Advisor their whole careers. They both work with clients on a regular basis and are very familiar with the challenges that advisors face both on the investment front and on the client front. When talking with either of them, their passion for this profession can be clearly seen and heard. The care for the end client is at the forefront of what they do on a regular basis. They designed the index so that it could be used for client accounts as a tax-efficient, low cost investment vehicle.

Kristopher Carroll, CFA®, CFP® serves as the Chief Investment Officer and Financial Advisor at the advisory firm. Kris works closely with pre-retirees and retirees with a specific focus on retirement income planning. A Chartered Financial Analyst® and Certified Financial Planner® practitioner, Kris holds a M.S. in Financial Mathematics from the University of Chicago and MBA from the University of North Carolina at Chapel Hill. He is currently pursuing his doctorate in Financial and Retirement Income Planning from The American College. His research interests include the study of optimal asset allocation for portfolios in withdrawals and dynamic withdrawal strategies in retirement.

He has been quoted in The Wall Street Journal, The Charlotte Observer, Charlotte Business Journal, FiduciaryNews.com, and other online financial publications. Currently, he is writing his first book about creating simple and durable retirement income to last a lifetime.

Patrick Bobbins, CFA®, CIMA® serves as the Director of Investments & Research at the advisory firm. He deeply enjoys talking with clients and advisors about their investment portfolios and understanding the level of risk that is necessary in pursuing their goals. Education and the mentality of being a lifelong learner is important to Patrick. In 2009, he graduated with honors from the University of North Carolina at Charlotte with a Bachelor Degree in Finance and minor in Economics. Patrick completed his master's degree from Wake Forest University, graduating in 2014 with an MBA. He has completed the CFA® and CIMA® designations. He has also taken his passion for education back to the classroom where he has been an adjunct professor, teaching a Financial Management class at UNC Charlotte to both undergraduate and graduate students.

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