

Executive Summary

The Evolution of Adaptive ETF Portfolio Strategy

We have entered an unprecedented time of innovation in new, cutting-edge technologies. This new age of enlightenment has led to the development of complex software algorithms, the growth of powerful investment platforms, and the evolution of unique liquid securities, such as Exchange Traded Funds (ETFs). The creation of ETFs has made it possible for investors to participate in highly diverse and specialized asset classes in ways that would have been unimaginable as late as the 1990s.

With these innovations have come the potential for momentous change, bringing opportunities to make game-changing improvements in how we invest. The full benefits of new technology, however, will not be realized until after the development of equally sophisticated applications have had a chance to catch up.

Just as personal computing devices and handheld smart phones heralded new opportunities, true value add only occurred in conjunction with the development of equally sophisticated applications. Examples of game changing applications are the Google search browser, GPS mapping programs, worldwide access to retail goods and services through Amazon or Ebay, and many more. These new applications changed established paradigms, conventional wisdom, and daily experiences that had existed for hundreds of years. The same opportunities now exist for investors in the financial markets.

We have at our disposal all the investment tools necessary to manage any market environment – bull or bear. Unfortunately, as investment tools continue to advance, most portfolio management methods remain remarkably the same. Traditional portfolio management practices lack access to methodologies and sophisticated applications that are dynamic enough to respond to both the new opportunities and the challenges from the ever-increasing complexities they bring. Instead, the investment management industry has generally refused to adapt to change. They continue to follow the same portfolio management methods that are based on fifty plus year old theories and assumptions regarding how markets work. The truth is that even with all the new tools and technologies available, the average investor is not doing any better than before. Traditional portfolio management strategy is as out of place in the new investing paradigm as it was in the old one. In other words, the traditional approach to risk and portfolio management never worked very well in the first place.

To begin with, traditional methods rely upon the assumption of a “risk/return relationship,” a phrase which has become as ubiquitous in finance as “supply and demand” has in introductory economics textbooks. The relationship hinges upon the acceptance of a tradeoff; invested money generates higher profits only if subjected to higher risk. Low levels of risk only entitle you to low potential returns. It is, in other words, a more formal articulation of the “no pain, no gain” principle.

Under this assumption, investing simply becomes a function of risk preference and time, as it further presumes that more risk will in fact provide higher returns given enough time.

The risk/reward proposition is an assumption born from business. A potential business owner would first determine whether or not business ownership is worth considering. Before a decision to move forward is made, one would make an analysis of personal financial condition, as well as skills and aptitudes. In addition, one would assess capital and cash flow need, timeline, and risk tolerance to determine what type of business may be best suited (start up, turnaround, or established). For the most part, the answers to these questions would be the primary factors to determine the proper balance between the “risk and return” proposition required to enter into a business.

The problem with the risk/reward assumption is that it simply does not hold true for financial markets and traded securities. Risk is either defined as volatility (high volatility is a bear market characteristic) or as the willingness to accept larger declines in portfolio value. Subjecting the portfolio to more risk of substantial declines offsets the benefit of higher gains because those gains could at any moment be wiped out. Substantial bear market declines of 20%, 30%, or more could take years to recoup the losses. Portfolio growth is not merely about making money but the ability to keep it. The key then is to create an efficient/stable portfolio that fits the existing market environment. Fixed percentage asset allocation methods, based on subjective risk tolerance labels and illustrated through multi-colored pie charts, fail to produce the necessary stability because their processes overlook a basic fact – markets are dynamic and pie charts are not. The mix of securities that maintained stability in a previous market environment will not necessarily do so when the environment shifts. Portfolio management is about creating and maintaining the most efficient portfolio through variable market environments.

The weaknesses of the traditional methods support the conclusion that portfolio managers need to dispense with many traditional assumptions (conventional wisdom) as well as subjectivity if they are to move forward. Subjective methods are, by definition, not testable and therefore are not statistically valid or relevant. Validity can only exist alongside written computer software programs, combined with extensive data, defined rules and testable results. A viable investment strategy, therefore, can only be an evidence-based, scientific approach. Only models with complete software systems that determine specific actions can make measurable claims of potential predictive value.

Subjective methods are furthermore ill-advised because they are often developed under a mistaken conflation of a company’s returns with the returns of a company’s stock. The strong performance of a company does not necessarily translate into strong performance of its stock. The difference lies in a distinction of liquidity. Ownership of a non-liquid, privately-held company means that corporate profits can pass through to the owners. Shareholders of publicly-traded corporations, on the other hand, do not directly participate in the underlying company’s profits, other than to receive

dividends. The value of the shares they hold fluctuate in price based on levels of supply and demand in the market, which tend to vary based on the degrees of rationality or irrationality of market participants.

Unfortunately, this makes it extremely difficult to predict what the markets will do or how it will perform in the future. We only know what the market environment is now. How then do we manage risk and create a model with predictive value? Surprisingly, a strategy that satisfies all of the conditions mentioned previously (evidence-based, systematic, dynamic, and capable of creating a stable environment) already exists and is widely used in creating a stable physical environment.

For example, when faced with fluctuations in outdoor temperatures, we can level the extremes by using a thermostat to maintain a consistent indoor temperature. The thermostat responds to the vagaries of the weather by turning up the air conditioner when it becomes too hot or the heater when it gets too cold. The goal is to optimize the indoor temperature regardless of the outdoor conditions. The key to the thermostat is the thermometer, which measures the current indoor temperature so that the thermostat can adjust the air conditioner or heater accordingly. Effective risk and portfolio management calls for its own thermostat process to manage the correct combination of securities that will create a stable portfolio throughout changing market environments.

Just as a thermostat has a process for identifying the current weather condition, an essential capability of the portfolio thermostat needs to be the ability to distinguish between a bull and a bear market. The systematic risk typical of each environment differs radically, with a normal bull market correction falling within the 8% to 12% range and volatile bear markets that decline upwards of 20% and require extended period to bottom out and to recoup the losses. An adaptive portfolio strategy, therefore, needs to be able to statistically identify the difference between an efficient market, with normal market noise, as opposed to an emotional, or volatile, bearish environment. In addition, the process must have a strategy to deal with unique periods called “trading anomalies.” Trading anomalies occur over short periods, typically days or weeks. During these times, a flood of sell orders hit the market, as buyers dry up. The markets suffer a sharp emotional decline that can substantially exceed the normal -8% to -12% correction. Trading anomalies, like what was experienced in February and March of 2020, require a special process to avoid the risk of being on the wrong side of a whipsaw, as the markets rebound at a time when most would least expect. Bottom line, Adaptive Portfolio management aims to make timely adjustments, within the portfolio’s holdings, in order to maintain a low risk, efficient portfolio through variable market environments.

Canterbury has developed an evidence-based portfolio management software system that does exactly that.

Overview of the Portfolio Thermostat Strategy

Step 1: Identify the Current Market Environment

Our studies show that changes in market volatility can be an effective leading indicator of future market behavior and direction. Low or decreasing volatility is typically associated with bull markets, while high and increasing volatility is characteristic of bear markets and bubbles. We use the Canterbury Volatility Index (CVI) as the market's "volatility" thermometer. The CVI flags an increase in volatility, which is a leading indication of a change in the market environment, most typically a negative change. Market environments are hardly black and white, though. Each macro environment – bull or bear – can be further categorized into separate Market States, identifiable by its own unique traits and tendencies. The Portfolio Thermostat identifies 5 Bullish (rational) Market States, 4 Bearish (irrational) Market States, and 3 Transitional Market States.

Step 2: Classify the Universe of ETFs into Diverse Investment Classes

The Portfolio Thermostat invests in ETFs. Most equity asset classes perform best when the S&P 500 (the market portfolio) is in a low volatility Market State. There are, however, alternative investment classes, including inverse ETFs that can benefit from high volatility or a bearish stock market. The model categorizes each ETF into one of two major classes: The Global Stock Market Universe or Bonds and Alternatives to the Global Stock Market.

Step 3: Construct an Efficient Portfolio to Match the Current Market Environment

All markets and securities will experience both bull and bear market environments. The Portfolio Thermostat's objective is to select the combination of securities that best fit the unique characteristics of the current market state. In other words, its goal is to create a consistently bullish portfolio, regardless of the macro market environment, so that the portfolio may benefit from long-term compounding. This requires a continual monitoring process wherein portfolio holdings are rotated in or out as the environment shifts in order to maintain the most optimal combination of securities.

The importance of the short-term, in the Portfolio Thermostat process, cannot be overemphasized. There is nothing we can do about the past. Decisions are made on a real-time basis, and as a result, successful long-term growth depends heavily upon how the short-term is managed. If the portfolio is not continually optimized to reflect the changing market risk conditions, then it will be vulnerable to suffering periods substantial declines. On the other hand, short-term fluctuations (noise) are an inherent characteristic of normal market behavior. Most short-term decisions, and decisions motivated by fear or greed in reaction to noise, can do more harm than good. The key is knowing which short-term factors are important and which are not. A viable strategy, therefore, needs to be dynamic enough to shift as the markets shift but use an objective, systematic, and testable process that can distinguish between significant changes and meaningless noise.

Adaptive Strategy and Liquidity

The decision to own a business can be based on the risk/reward of the enterprise and the owner's time horizon. If one is willing to take a well-informed "business risk," then the potential for higher profits may exist. All aspects of a business enterprise must be managed in a coordinated method. Management decisions and the activities surrounding a business occurs on a real-time basis.

Financial securities are liquid and prices continually fluctuate based on the law supply and demand for the shares. The advantage of liquid securities is that the price of the shares can go up much higher than the underlying company's profits. The disadvantage is that the price of the shares can go down even though the company may be reporting profits. Therefore, a methodology to use the liquidity of the shares for the purpose of adapting the portfolio's holdings to match the current environment, must be implemented. Such a process should coordinate all aspects of asset allocation, diversification, security selection for the purpose of holding the most "efficient" combination and dollar amounts of securities.

Adaptive portfolio management requires daily (short-term) monitoring. Buy and sell decisions and actions should occur in real-time, following a change in the market environment. Markets are dynamic; therefore, a successful adaptive portfolio must have a dynamic process that is capable of managing the primary advantage of owning securities: liquidity. If we do not use liquidity to our advantage, then it will become a disadvantage.

Buying and holding a portfolio of traded securities over the long run makes as much sense as choosing not to manage your business, but instead, forcing a sale of your business and purchasing a new one every other month. Businesses are not liquid, and the operations must be managed. Shareholders do not manage the businesses. Instead, they must have a method to manage the purchase and sale of securities to maintain the most efficient portfolio. Contrary to conventional wisdom, owning a portfolio of securities is not about the so called "risk/reward" relationship; it is about creating efficiency within the portfolio. Just as business owners aim to produce consistent profits, adaptive portfolio managers aim to manage the risks of volatility. It is only through effective risk management that one can expect to achieve long-term compounded returns.

Conclusion

As technologies improve and the creation of new tools evolve, such as ETFs, we must be willing to take a hard look at many of our long held traditional beliefs and theories. With the identification of false assumptions, inefficiencies, and flaws, portfolio management methods must evolve to address them, as well as the changing landscape in which they operate. In the past, bullish market environments were required to produce profitable portfolios. Today, it is possible to produce the benefits of compounded returns through any market environment – bull or bear.

Disclosure: All definitive statements and subjective opinions contained in this academic study represent the observations and conclusions of the author, Tom Hardin. The sole purpose of the production of this report is to make a contribution to the body of knowledge in the field of investment portfolio management. This report is to be used for educational purposes only and is not to be used or considered as solicitation for any investment management services offered by Tom Hardin, Canterbury Investment Management, or any Registered Investment Advisor receiving sub advisory services from Tom Hardin. Additional disclosures and disclaimers are contained throughout this report.