Should Leveraged ETFs Be Held for Long Horizons?

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C. Thomas Howard, Ph.D.
CEO and Director of Research
AthenaInvest Advisors, LLC

Lambert Bunker
VP Business Development
AthenaInvest Advisors, LLC

David Stock
Director of Client Services
AthenaInvest Advisors, LLC

There are numerous misconceptions and emotions surrounding the use of leveraged ETFs (LETFs). This article provides a simple and clear explanation of how these instruments can be used to enhance portfolio returns over longer term investment horizons. We show that commonly used 2x ETFs have delivered the expected return over multi-year time horizons.

Regulators and Myths

Regulators, compliance departments and many others, driven by a desire to set what they consider realistic investor expectations, have taken an extreme and unrealistic view. They have been focused on the issue that 2x products may not deliver exactly 2x over holding periods longer than a day. In this argument, they often use a theoretical expected return of 0%. If you think expected returns are going to be zero, then there is no reason to take on volatility drag and fees imposed by products like LETFs over a longer time horizon.

But the stock market does not have an expected return of 0%. Returns have been closer to 9% over the last 145 years and 11% since 1951.

Paradoxically, we readily accept leverage in margin accounts, which are highly regulated and scrutinized by the most sophisticated risk management groups. Numerous financial products use leverage in the form of options, futures and swaps. There is the emotional argument that somehow all leverage is bad, which is not based on sound logic but rather on the cumulative impact of powerful anecdotal stories. Yet we are all happy to use high levels of debt (a.k.a. leverage) throughout our lives for home ownership, vehicle purchases and education.

LETF Basics

It is well known that compound return is less than the corresponding average return due to volatility. This is known as "volatility drag," which decreases returns. For example, the average annual U.S. stock market return from 1951 through 2014 was 12.4% while the compound return was 10.9%. The 150 basis point difference was due to volatility drag, the result of a non-levered 17.5% standard deviation in annual returns.

When using leverage, the volatility drag is amplified exponentially and has a much greater effect on overall returns as a result of an increased standard deviation. Volatility drag over longer time periods causes a greater degree of tracking error than the return times the leverage multiple over the same time period. The LETF return is given by the following equation:

$$\text{LETF Return} = (\text{Average Return} * \text{Leverage}) - (\text{Volatility Drag} + \text{Fees})$$

As this equation shows, it only makes sense to use leverage over a long time horizon in cases where the expected market return is positive and the leverage multiplied by the returns exceeds the volatility drag and fees.

The most important determinant of whether leverage will increase compound returns is the level of expected returns. For a 2x U.S. equity LETF, the critical value is 6% expected return based on a 17.5% standard deviation. That is, if the expected market return is higher than 6%, then on average a 2x LETF generates higher compound returns and increased long horizon wealth, as compared to a non-levered 1x holding.

As an example, continuously holding a daily 2x leveraged U.S. stock market position from 1951-2014 would have generated an annual compound return that was 1.87 times the annual unlevered compound return. If a 1% per year management fee was included, you would end up with 1.76x returns. This shows that despite the impact of volatility and fees over a 65-year period, which included a number of dramatic market declines, outsized returns close to 2x were achieved.

In a comprehensive study, Hill and Foster (2009) used an extended time series of U.S. stock market returns. They found that, during most time periods, the longer term 2x compound returns are very close to two times the unlevered compound returns. They went on to show that if volatility is high during a period, returns are less than 2x and if volatility is low, returns are greater than 2x, but most of the time they are very close to double the unlevered returns. Thus, the actual returns experienced in the stock market are sufficient to produce much larger levered returns (versus an unlevered position), as the increased volatility drag does not destroy the additional returns resulting from the use of leverage.

Optimal Leverage

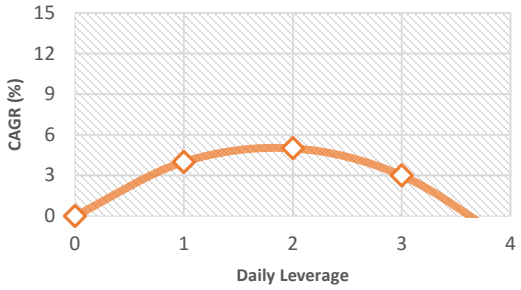
Now that the basics of LETFs have been discussed, let's turn to the question of the optimal amount of leverage in equity markets. A 2x LETF doubles the average return while increasing volatility drag by a factor of 4; 3x triples the average return while increasing drag by a factor of 9; and so forth. That is, average return increases linearly, and drag increases exponentially. So as leverage increases, growing drag eventually overwhelms the levered return, resulting in lower compound returns.

Cooper (2010) examined the relationship between leverage and returns from the U.S. stock market, after fees, from 1885 to 2009 and the S&P 500 from 1950 to 2009. Cooper's six graphs below reflect the convex relationship between leverage and compound return. They reveal that optimal leverage is somewhere between 2x and 3x depending on the market and time horizon under consideration. However, the analysis below is based only on price index movements and not reflective of dividends reinvested over time. Most LETFs today are based on total-return swaps that incorporate dividends and corporate actions, resulting in a higher total return and easier hurdle to overcome volatility drag and fees (as compared to the price index that doesn't include dividend income in its returns).

Figure 1 INDEX RETURNS VERSUS DAILY LEVERAGE LEVELS

TIME PERIOD FOR EACH INDEX INDICATED BELOW

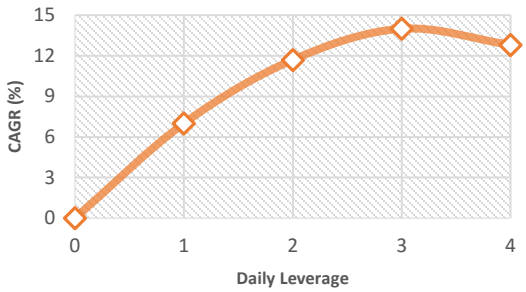
US Stock Market (1885 – 2009)



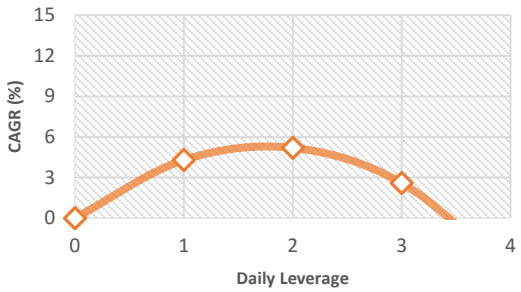
Quick Comparison

MARKET	OPTIMAL	1x RET	2x RET	RATIO
US Stocks	1.9	4.0%	5.0%	1.25
S&P 500	3.2	7.0%	11.7%	1.67
Dow Jones	1.9	4.3%	5.2%	1.21
NASDAQ	2.2	7.7%	11.3%	1.47
Russell 2000	2.0	6.2%	8.5%	1.37

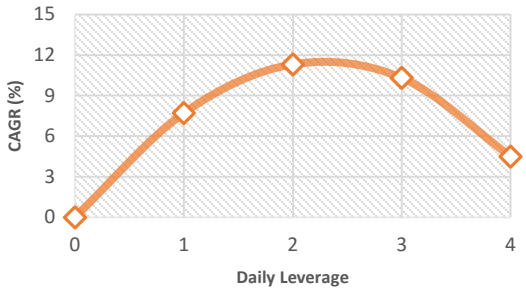
S&P 500 Price Index (1950 – 2009)



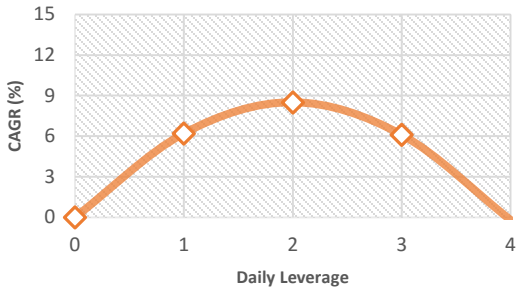
Dow Jones Industrial Average (1928 – 2009)



NASDAQ Composite Index (1971-2009)



Russell 2000 Price Index (1987-2009)



Source: Cooper, Long Term Behavior of Leveraged ETFs

Actual LETF Performance

The research above revealed that LETFs can be held for time periods longer than a few days. But how do these products work in real portfolios? Our firm has used 2x LETFs to deliver increased beta exposure in the tactical portfolio we manage for clients.

The table below shows the actual performance of our LETFs in each of two extended periods since inception (September 2010), during which a 100% LETF position was held. The table compares actual compound returns achieved with 2x LETFs versus the corresponding unlevered index compound total returns.

During 2013, a period of low volatility, the 2x Russell 2000 LETF was held for eight months and generated a return multiple of greater than 2x (41.6% versus 20.1%). In 2014 and early 2015, a period of higher volatility, the 2x S&P 500 LETF was held for 11 months and generated slightly less than 2x (26.2% vs 13.6%). Despite performance drag due to volatility, fees and tracking error, a beta exposure close to our target of 2x was achieved while holding an LETF over extended time periods.

Figure 2 LEVERAGE RATIO EXPERIENCED IN LIVE PORTFOLIOS
2013, 2014-2015

Months	2x Leveraged ETF	2x Return	1x Index	1x Return	Ratio
8	2x Russell 2000	41.6%	Russell 2000 Index	20.1%	2.06
11	2x S&P 500	26.2%	S&P 500 Index	13.6%	1.93

Source: Thomson Rueters, March 2015

Conclusion

Several factors impact daily-reset LETF returns when held over extended holding periods: expected market returns, volatility drag, fees and tracking error. Despite the misconceptions and negative press associated with LETFs, it is possible to achieve excess returns in both theory and practice over extended holding periods. The most important variable is the expected return of the underlying index, which must be high enough to overcome the volatility drag and fees imposed by LETFs.

Our research has shown that the long-term optimal leverage is 2x to 3x, depending on the underlying equity market. Consequently, 2x LETFs deliver the desired results when held over long time periods.