



Leveraged Exchange-Traded Funds

David Stanley

Evidence for the popularity of exchange-traded funds (ETFs) is found in their proliferation. There are literally dozens of these available now to Canadians. Investors need not limit themselves to purchasing funds that are designed to mirror the performance of specific equity indices, sectors, currencies, fixed-income benchmarks, or commodity futures. For example, inverse or opposite ETFs exist by which one profits when an index declines in value. In this column, however, I want to explore the idea of using leveraged ETFs. If the funds provide 2 times leverage, this means that the funds are designed to double the daily change in the index. Bull ETFs are suppose to produce double the daily performance of their underlying index or benchmark; Bear ETFs are suppose to produce double the daily performance opposite that of the underlying index or benchmark.

The only funds of this type available to Canadian investors currently are those from Horizons BetaPro, although products of this type are available in the U.S. that offer 3 times leverage. At present Horizons BetaPro offers 28 of the Bull and Bear ETFs (details and prospectus available at <http://www.hbpetfs.com/leveraged.asp>). According to the company, "Horizons BetaPro Exchange-Traded Funds are the fastest growing family of ETFs in the country and are now Canada's largest and most frequently traded family of ETFs. Horizons BetaPro Funds and ETFs are a unique series of investment tools which allow investors to profit or protect in bull and bear markets by providing 2 times daily or inverse daily exposure to 14 key equity, bond, currency and commodity benchmarks."

In other words, investors are offered the ability to double the performance of an index for the same amount of money. These funds are easy to purchase through a broker and are much simpler than using options, futures and margins to obtain leverage. This sounds pretty impressive but I think we should take a more in-depth look at leveraged funds.

We will begin by considering the game of roulette. If you play this gambling game in North America you will place a bet on one of 38 numbers ranging from 1 to 36 that are alternately coloured red or black. The other two num-

bers are 0 and 00 and are usually green. A common bet is to select either red or black, or odd or even, and if you win this bet you will be paid one chip for each one wagered. Since there are 38 possibilities and only 18 are favourable, the odds against winning are $[(20/38)/(18/38)] = 1.111$ to 1. Gamblers have long tried to develop a strategy to beat these odds. One of the oldest is the Martingale betting system that was developed in 18th-century France. In its simplest form the gambler would double his bet after every loss, so that when a win did occur he recovered all the previous losses plus win a profit equal to the original stake.

This is obviously a simple leverage strategy – the more you bet, the more you can win or lose. The flaw in this strategy should be immediately apparent. Let's say you take \$63 into a casino and repeatedly bet \$1 on red at a roulette wheel. All is well until you lose six spins in a row. At this point you will have lost your stake and the game cannot continue. Perhaps you think that the probability of losing six spins in a row is infinitesimally small. They are small (2.13%), but if you play long enough the odds increase rapidly so that in 68 spins there is a 50.3% chance that you will lose 6 times in a row and in 250 spins there is a 95.3% chance that you will lose 6 times in a row [[http://en.wikipedia.org/wiki/Martingale_\(betting_system\)](http://en.wikipedia.org/wiki/Martingale_(betting_system))].

In other words, the house always has the edge, or as John Maynard Keynes put it, "Markets can remain irrational longer than you can remain solvent."

Now, back to leveraged ETFs. How do they seek to meet their investment objectives? By employing a range of strategies including (from the prospectus) "securities, futures contracts, options on futures contracts, forward contracts, swap agreements, options on securities and indices, money market instruments, reverse repurchase agreements or a combination of the foregoing." All these purchases and sales are expensive, leading to a MER of 1.22%, which is much higher than non-leveraged ETFs. Note that their mandate is based on daily returns. They specifically state that they do not seek to provide correlation with the underlying index over a period of time, other than daily. This is because they must rebalance each day in an attempt to achieve their

stated objective on the next day.

This differentiates leveraged from traditional ETFs that have no need to rebalance so frequently. A recent paper (Cheng and Madhavan, 2009, <http://etfdb.com/2009/are-leveraged-etfscreeating-systemic-risk-in-the-markets/>) gives an example: “A double-inverse ETF promising 2 times the index return requires a hedge equal to 6 times the day’s change in the fund’s Net Asset Value.” Consider how difficult it would be to try to predict the result of six sequential stock market results, rather like trying to guess six sequential roulette results, or the risk involved in using six-fold leverage in either gambling or investing.

How have these funds been doing? The prospectus lists the results for two funds designed to provide twice either the upside or downside results of the S&P TSX 60 Index for the year 2007. These are shown in Table 1. Since the Index had a positive year, it might be expected that HXU would have doubled that return. In fact, taking the MER into account, the fund topped the index by 88%. Not bad but not a double either, and remember that 2007 was marked by low volatility and a gentle upward trend.

A more complete view of these funds is shown in Figure

TABLE 1 - ANNUALIZED RESULTS FOR TWO LEVERAGED ETFs FOR 2007

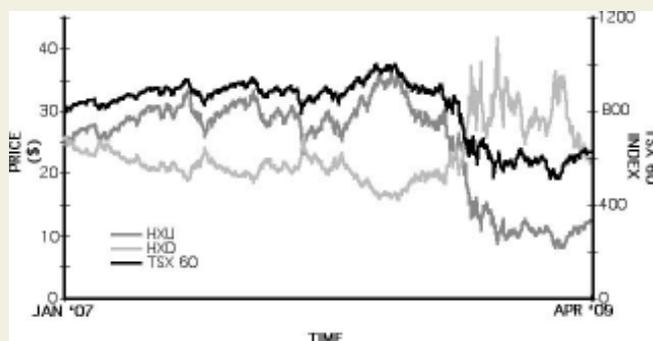
ETF	Annual Return (%)	MER
HXU	19.20	1.22
HXD	-19.16	1.22
S&P TSX 60 Index	11.60	

Source: Horizons BetaPro prospectus, Globefund.com

1. From the inception of the two funds in January 2007 through mid-April 2009, HXU has lost 51%, HXD has lost 14%, and the S&P TSX 60 Index has lost 22%. It does seem, as stated in the prospectus, that the promise of achieving twice the daily return of the underlying index cannot be extrapolated over a longer period. This has major implications for buy-and-hold investors. It is interesting to note the enhanced volatility, particularly in the HXD fund, after September 2008 when the two funds crossed, resulting I suppose from a turn to negative sentiment on the future of the market, and volatility increased. High volatility works against leveraged ETFs as can be seen by comparing the volatility and return of 2007 with those of late 2008 and 2009. Cheng and Madhavan (2009) have shown that the volatility for a leveraged ETF is simply x times the volatility of its underlying index where x is the degree of leverage.

This deterioration of results over time implies that holding periods should be limited. Table 2 shows that this is the case and provides other data gathered by Cheng and Madhavan (2009) on 84 leveraged U.S. ETFs. MERs are

FIGURE 1 - PRICES FOR HXU, HXD, AND THE TSX 60 INDEX FROM JANUARY 2007 THROUGH MID-APRIL 2009.



Data Source: www.globefund.com, www.ca.finance.yahoo.com/

lower in the U.S. than here, but still much higher than non-leveraged products. High bid-ask spreads and MERs can add considerably to the cost of ownership, especially if holding times are short and commissions are frequent.

TABLE 2 - STATISTICS ON 84 U.S. LEVERAGED ETFs (JANUARY 2009)

Leverage factor	-3	-2	-1	+2	+3
Bid-Ask Spread (bp)	10.5	35.3	11.8	42.4	16.8
Avg Order Size (\$'000s)	49.3	67.8	23.5	17.8	23.7
MER (%)	0.82	0.89	0.95	0.89	0.82
Avg Days Held	1.2	6.7	8.6	15.2	1.7

bp = basis points

Source: Cheng and Madhavan (2009), *The Dynamics of Leveraged and Inverse Exchange-Traded Funds*, <http://etfdb.com/2009/are-leveragedetfscreeating-systemic-risk-in-the-markets>

Let’s see what we have learned about these ETFs. On the plus side, they provide a convenient way for individual investors to obtain the benefits of leverage when purchasing equity indices, sector indices, emerging market indices, fixed income, currencies, and commodities. But this comes at the price of high frictional costs, large volatility, and the lessening likelihood of positive returns over longer investment periods. It seems to me that buy-and-hold investors should acquire a thorough knowledge of these funds before they consider adding them to their portfolios. The idea of guessing if the market will go up or down on a daily basis makes about as much sense to me as betting at the roulette table. Martingale wagering, whether at the casino or the stock market, often leads to the poorhouse.

As always, I hope this column will generate discussion and I will attempt to answer your questions within the guidelines set up by *Canadian MoneySaver*.

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Leveraged ETF Report

The Canadian Foundation for Advancement of Investor Rights (FAIR), a recently formed, non-profit organization whose intention is “to be a voice for investors on security regulations and a catalyst for enhancement of Canadian shareholders and retail investors” has produced a report on leveraged ETFs. They came to the same conclusion as David Stanley, i.e. retail investors should be very wary of these products.

See David’s comprehensive article on page 9 of this issue of *Canadian MoneySaver*. Visit <http://faircanada.ca/en/currentissues/submissions> to read this report.