

# Understanding Leveraged and Inverse Investments: The Importance of Compounding

Leveraged and inverse investment products provide the opportunity for magnified exposure to a desired index. However, it's important to note that the use of leverage by a mutual fund or ETF also increases the risk of the fund. The more leverage an investment product has, the more the leverage will magnify both gains and losses on those investments.

Many leveraged and inverse investment products are benchmarked daily to published indices. And while a fund or ETF may perform in line with its benchmark index on a daily basis, it may either trail or outperform its benchmark index over longer periods. This is due to the nonlinear effects of leverage and the dynamics of compounding.

In order to properly evaluate leveraged investment products, it's vital to have a solid understanding of the effect of mathematical compounding on their respective returns.

## **AN EXPLANATION OF COMPOUNDING**

Compounding is an investment dynamic that enables an asset to generate gains or losses on any reinvested gains or losses. Compounding is affected by the volatility of the return stream as well as time in the market. All investments, not just leveraged and inverse ones, are affected by compounding. For example, let's take a look at a \$100 stock and its progression in value over a two-day period in three simplistic hypothetical scenarios:

- 1 an upward-trending market
- 2 a downward-trending market
- 3 a volatile, upward and downward-trending market

## **Important Concepts**

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## Upward

<b>Start with \$100 Investment</b>	Market impact	Gain on investment	End of day investment total
Day one \$100.00	Up 10%	\$10.00	\$110.00
Day two \$110.00	Up 10%	\$11.00	\$121.00
<b>Expected Total</b>	<b>20%</b>	<b>\$20.00</b>	<b>\$120.00</b>
<b>Actual Total</b>	<b>21%</b>	<b>\$21.00</b>	<b>\$121.00</b>

## Downward

<b>Start with \$100 Investment</b>	Market impact	Gain on investment	End of day investment total
Day one \$100.00	Down 10%	-\$10.00	\$90.00
Day two \$90.00	Down 10%	-\$9.00	\$81.00
<b>Expected Total</b>	<b>-20%</b>	<b>-\$20.00</b>	<b>\$80.00</b>
<b>Actual Total</b>	<b>-19%</b>	<b>-\$19.00</b>	<b>\$81.00</b>

## Volatile

<b>Start with \$100 Investment</b>	Market impact	Gain on investment	End of day investment total
Day one \$100.00	Up 10%	\$10.00	\$110.00
Day two \$110.00	Down 10%	-\$11.00	\$99.00
<b>Expected Total</b>	<b>0%</b>	<b>\$0</b>	<b>\$100.00</b>
<b>Actual Total</b>	<b>-1%</b>	<b>-\$1.00</b>	<b>\$99.00</b>

In each of the examples above, compounding played a role in the ending investment amount at the end of the hypothetical period.

### LEVERAGE MAGNIFIES COMPOUNDING

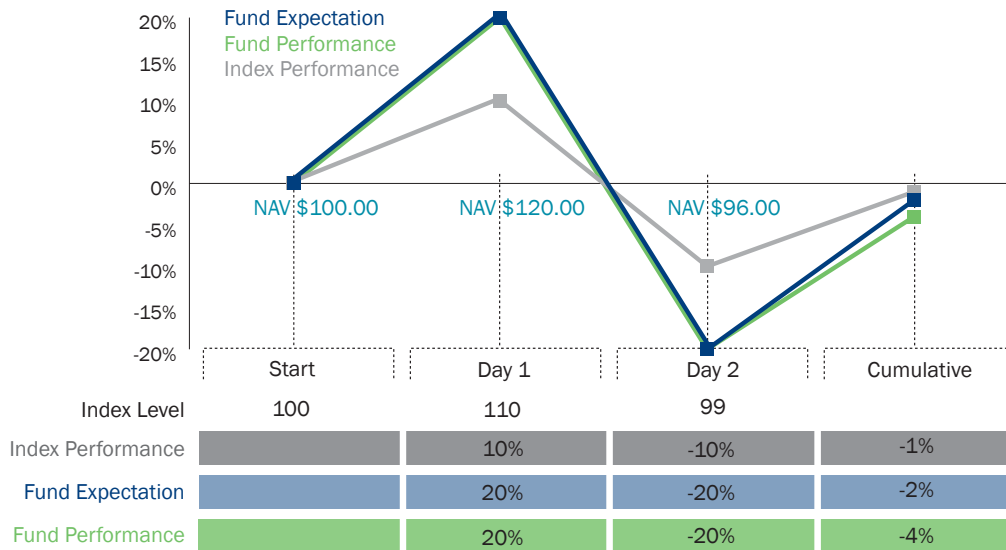
As leveraged investments magnify the impact of market movements, the results of compounding are also magnified. In an upward- or downward-trending market, a leveraged investment that is on the correct side of the trend will see magnified end results, while one on the wrong side of the trend will see magnified losses. When the underlying index is volatile, the leveraged fund or ETF will amplify this volatility.

### AN EXAMPLE OF LEVERAGED COMPOUNDING

For example, consider a hypothetical mutual fund or ETF that is designed to produce returns that correspond to 200% of an index. On the first day of a period, the index rises from a level of 100 to a level of 110, producing a 10% gain and an expectation that the fund will rise by 20% (10% x 2). On the same day, the value of the leveraged fund increases from \$100.00 to \$120.00 for a gain of 20%—in line with its benchmark.

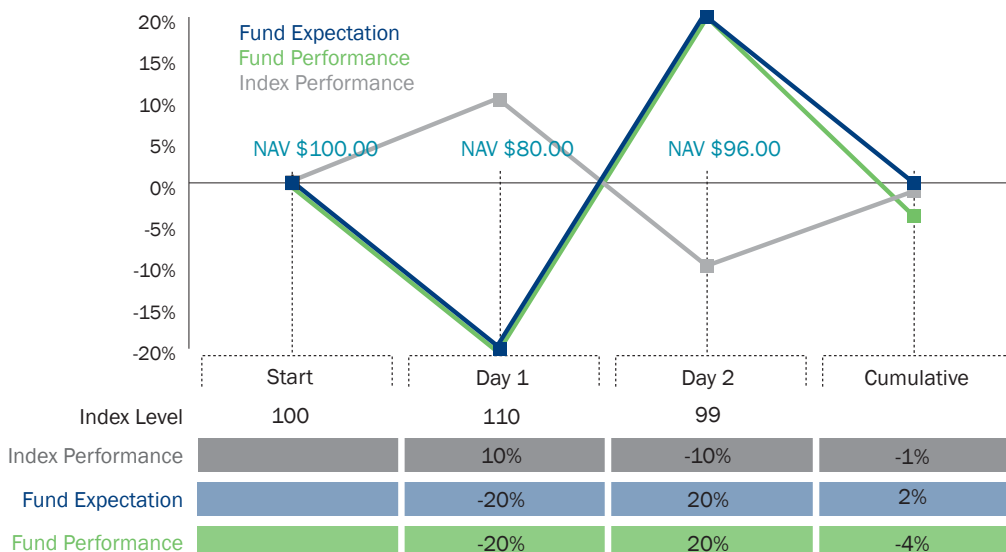
On day two, assume the index falls from 110 to 99 for a loss of 10%. The fund, as expected, falls 20% to a price of \$96.00. On each day, the fund performed exactly in line with its benchmark, but for the two-day period, the fund was down 4%, while the index was down only 1%.

Without taking into account the daily compounding of returns, one would expect the leveraged product to lose 2%. However, due to compounding, it actually lost 4%, thereby performing as was intended. This example is summarized in the chart and table below.



### AN EXAMPLE OF INVERSE LEVERAGED COMPOUNDING

Having a simple additive return expectation, which does not account for the effects of compounding, is also not appropriate for inverse leveraged products. Below is the simple example of a hypothetical mutual fund or ETF designed to produce returns that correspond to -200% of an index. In this example, the market was up 10% the first day and down 10% the next, with the index returning a -1% cumulative performance. One might then expect the inverse fund to be up 2% (-2 x -1%). However, the effects of compounding provide a net two-day result of -4%, as summarized in the chart and table below.



As illustrated by these simple examples, the effect of leverage can make it difficult to form longer term expectations or judgments about a leveraged fund's performance given only the returns of the unleveraged index. As a general rule of thumb, more leverage will magnify the compounding effect. In addition, periods of high volatility in an underlying index will also cause the effects of compounding to be more pronounced.

### **THE IMPORTANCE OF MONITORING INVERSE AND LEVERAGED INVESTMENTS**

These effects make it especially important for investors to understand the possible effects of compounding on leveraged and inverse mutual funds or ETFs before making any investment decisions. Investors should monitor their leveraged and inverse holdings consistent with their strategies, as frequently as daily and consult with their financial advisor before deciding what, if any, course of action to take for their particular situation.



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This piece is intended to be for information purposes only. Investors should discuss these concepts and their personal financial situation with their financial advisor or advisors prior to making any investment decisions.

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