ProShares | ProFunds

THE UNIVERSAL EFFECTS OF COMPOUNDING AND GEARED FUNDS

Compounding is a universal mathematical concept that affects the returns of investments. It is important for all investors to understand how compounding affects returns in different market conditions—upward-trending, downward-trending and volatile. For geared (leveraged and inverse) fund investors, it is particularly important to understand that the effects of compounding may be more pronounced in funds with larger or inverse multiples, and in funds with volatile benchmarks. It's possible for significant gains and losses to occur much faster in geared funds.

Compounding with conventional investments

Let's take a hypothetical look at how compounding affects conventional investment returns in upward-trending, downward-trending and volatile markets.

When "10% + 10% = 21%"

In an upward-trending market, compounding can result in longer-term returns that are greater than the sum of the individual daily returns.

An investor who starts with $100 in an investment that rises 10% a day for two consecutive days would have $121, or a 21% gain (not 20%).

When "-10% + -10% = -19%"

In a downward-trending market, compounding can also result in longer-term returns that are less negative than the sum of the individual daily returns.

An investor who starts with $100 in an investment that declines 10% a day for two consecutive days would have $81, or a 19% loss (not -20%). This is because day two's loss is calculated on day one's lower ending balance of $90, not the original $100.

When "10% + -10% = -1%"

In a volatile market, compounding can result in longer-term returns that are less than the sum of the individual daily returns.

An investor who starts with $100 in an investment that rises 10% on one day and declines 10% the next would have $99, or a 1% loss (not 0%). Day two's loss is calculated on day one's larger ending value after its gain.

Glossary

Compounding: the cumulative effect of applying gains/losses and income to principal over time. Each period's gains or losses enlarge or shrink the base from which the next period's returns are calculated.

Conventional investment: Any investment that does not use leverage or inverse exposure to provide a multiple or a multiple of the inverse return of a benchmark (e.g., index funds, savings accounts, stocks, bonds, mutual funds).

2x leveraged fund: A fund designed to provide twice the daily return of an index or other benchmark. (These funds do not attempt to produce the return during any period other than a day. Results for longer than one trading day will likely differ from the return of twice the index over the longer period.)

Volatile market: A market characterized by substantial up and down price swings over a period of time.

Note: All examples use extreme and simplified hypothetical market movements, and are for illustrative purposes only. Actual market movements can be meaningfully different. Examples do not reflect the impact of expenses or taxes, which would lower the results shown.

ProShares and ProFunds entail certain risks, which may include risk associated with the use of derivatives (swap agreements, futures contracts and similar instruments), imperfect benchmark correlation, leverage and market price variance, all of which can increase volatility and decrease performance. ProShares are generally non-diversified. Please see summary and full prospectuses for a more complete description of risks.

Compounding with geared investments: "The same but more"

Now let's use a 2x leveraged fund as an example to see how compounding affects geared fund returns in upward-trending, downward-trending and volatile markets. Compounding in geared funds can result in gains or losses that occur much faster and to a greater degree than with conventional investments.

When "20% + 20% = 44%"

In an upward-trending market, compounding can result in longer-term leveraged returns that are greater than two times the return of the conventional investment.

An investor who starts with $100 in a leveraged fund that rises 20% a day (2 x 10% index gain) for two consecutive days would have $144, or a 44% gain (not 40%). As before, this is because day two's return is calculated on a base that includes day one's gain—this time magnified by 2x.

When "-20% + -20% = -36%"

In a downward-trending market, compounding can also result in longer-term leveraged returns that are less negative than two times the return of the investment.

An investor who starts with $100 in a leveraged fund that declines 20% a day (2 x 10% index decline) for two consecutive days would have $64, or a 36% loss (not -40%). This is less than 2 x -20% because day two's return calculated on day one's compounded loss is only $16, since it is calculated on day one's ending balance of $80.

When "20% + -20% = -4%"

In a volatile market, compounding can result in leveraged longer-term returns that are less than two times the return of the unleveraged investment.

An investor who starts with $100 in a leveraged fund that rises 20% one day (2 x 10% index gain) and declines 20% the next (2 x 10% index decline) would have $96, or a 4% loss (not 0%). This is four times the compounded 1% loss of the conventional investment on page one (third example). Compounding can also result in returns that are in the opposite direction of the underlying index during periods of unusual volatility.

Does compounding affect the returns of conventional index funds? If so, why don't I see it?

Over time, compounding can make returns of an indexed investment either greater than or less than the simple sum of the individual daily returns. However, this effect is not easy to see by merely comparing the return of the investment versus the return of the index. The reason? Conventional indexes such as the S&P 500 and the Dow Jones Industrial Average have the effect of compounding incorporated into their returns.

Why aren't the longer-term returns of a geared 2x fund normally two times the return of its underlying index?

The impact of compounding on a 2x fund is generally greater than twice the impact of compounding on an equivalent conventional investment. As a result, the longer-term return of a geared fund can be significantly greater than or less than two times the return of its underlying index for the time period. For instance, the leveraged fund return in the volatile market example on this page (third example) results in a 4% loss, a much greater loss than two times the 1% loss in the volatile market for the conventional investment on page one (third example).

In summary

The effect of compounding can help returns in upward- and downward-trending markets and hurt in volatile markets, assuming all other variables remain the same. Investors should recognize that over time this effect can be magnified significantly in leveraged funds. The use of leverage generally increases the risk of investing in the funds. Leveraged funds are not suitable for all investors. Investors should actively monitor their holdings consistent with their strategies, as frequently as daily.

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