Rebalancing Leveraged and Inverse Fund Positions

Most leveraged and inverse funds are designed to provide a multiple (for example, a "fund multiple" of +2x or −2x) of an underlying index return on a daily basis, before fees and expenses. Over time, the returns of these funds may be greater or less than the index return times the fund multiple, primarily due to the effects of daily compounding.

Leveraged and inverse funds are most often used as short-term tactical tools. Investors who want to hold them for longer periods should consider a rebalancing strategy to seek returns over time that are close to the fund multiple times the index return.[1] Rebalancing involves periodically adding to, or subtracting from, fund positions to realign exposure to the underlying index. **Note that rebalancing can entail transaction costs and tax consequences that should be considered when determining a rebalancing strategy.**

The following three steps show a trigger-based rebalancing technique that applies to all leveraged and inverse funds.

1. Monitor the Gap. Monitor the difference between the unleveraged (1x) index return and the leveraged or inverse fund return.

Gap = Index Return – Fund Return

If the Gap reaches a certain level over your holding period (e.g., you might use ±5% or ±10% as a trigger), you may choose to rebalance. Our example at the right shows a Gap of +15% between an index return (+5%) and the return of a related inverse fund (–10%).

2. Calculate your rebalance trade. If the index return is greater than the fund return, you may choose to add to your fund position. If the index return is less than the fund return, you may choose to decrease your position. In our example, the Gap is +15%, so you would increase your inverse fund position to rebalance.

To calculate your trade in dollars—regardless of the fund multiple—use the following formula:

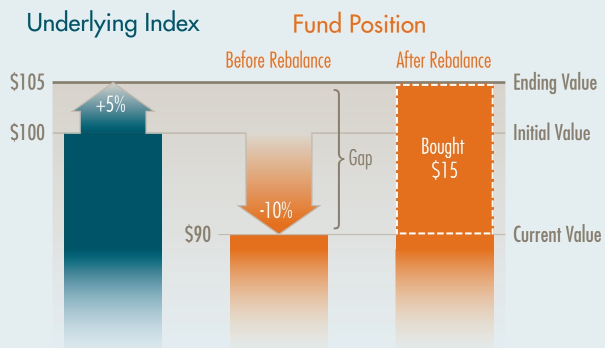
Trade $ = Initial $ x (1+ Index Return) – Current $

In our example, take the initial position ($100), multiply it by 1.05, and subtract the current position ($90), to get +$15. Add $15 to your position, and you are realigned to the index price (at $105) with the desired exposure.

3. Repeat. Continue to monitor the Gap and rebalance according to your rebalancing strategy (see page 2).

[1] Joanne M. Hill and Solomon G. Teller, "Rebalancing Leveraged and Inverse Funds," *Eighth Annual Guide to Exchange Traded Funds & Indexing Innovations, Institutional Investor Journals* (Fall 2009): 67–76. Hill and Teller are employees of ProFunds Group affiliates.

Rebalancing an Inverse Fund Position



For illustrative purposes only. One cannot invest directly in an index.

This chart shows the returns of an inverse fund and its underlying index over an unspecified time frame. Each started at $100. Over time, the index returned 5% and the inverse fund returned −10%, yielding a +15% Gap.

To calculate the rebalance trade, apply the formula:

Trade $ = $100 x (1+ 0.05) – $90
Trade $ = $105 – $90
Trade $ = $15

The fund investor must add $15 to his current position of $90 so that his dollar exposure is realigned to the ending index price of $105.

Note: Investors in leveraged and inverse funds rebalance by withdrawing capital on investment gains and adding capital on investment losses. By rebalancing, investors reposition their dollar exposure to the index to target cumulative returns that are consistently close to the index return times the fund multiple.

Determining Your Rebalancing Strategy

Rebalancing can be an effective strategy for leveraged and inverse fund investors seeking to achieve returns over time that are consistently close to the fund multiple (e.g., +2x or –2x) times the index return.

There are two common approaches to designing a rebalancing strategy: trigger-based (see page 1) and calendar-based. No matter which rebalancing method you choose, you need to monitor your fund positions carefully.

- Trigger-based. This approach activates rebalancing each time the Gap between the index return and the fund return reaches a specific threshold (e.g., ±5% or ±10%).
- Calendar-based. This approach entails rebalancing at set time intervals (e.g., weekly, monthly or quarterly). Calendar-based strategies are generally less tuned to market conditions than trigger-based strategies are—they can lag in responding to volatile market conditions and require more trading in low volatility periods. In effect, a calendar approach ignores the size of the Gap between the index return and the fund return, which should be monitored carefully.

Factors that Affect Rebalancing Frequency

For any leveraged or inverse fund rebalancing strategy, it is critical to monitor your fund positions frequently. How often you may need to implement a rebalancing trade is influenced by the characteristics of the fund and the index, as well as by market conditions.

- The Fund Multiple. The higher the fund multiple (e.g., 3x versus 2x), the more frequently you will generally need to rebalance. In addition, an inverse fund requires more rebalancing compared to a corresponding leveraged fund (e.g., –2x versus +2x) because it moves in the opposite direction of the underlying index each day. (See our example on page 1.)
- Volatility. A leveraged or inverse fund based on an index with higher volatility (such as the NASDAQ-100) may require more frequent trades to rebalance than one based on an index with lower volatility (such as the S&P 500).
- Percentage Trigger. A larger percentage trigger implies that fewer trades may be required over time. All other factors being equal, a percentage trigger of ±10% will require less rebalancing than one of ±5%, although the size of your trades may be larger.

Rebalancing: Practical Considerations

1. Evaluate the potential benefits of rebalancing against all related transaction costs and tax consequences.
2. Rebalancing may entail adding to your fund position. Do you have available cash?
3. Monitor your leveraged or inverse fund positions frequently, no matter how often you intend to rebalance.
4. Be aware that rebalancing can reduce both the negative and the potential positive effects of daily compounding.

   For example, in low volatility up- or down-trending markets, daily compounding can enhance the potential returns of leveraged and inverse funds. In such circumstances, a rebalancing strategy may result in underperformance compared to fund positions that have not been rebalanced, even though you may have achieved returns that are closer to the index return times the fund multiple.