

Short sales and dollar-neutral strategies

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Basic outline of a short sale

The idea of a short sale is to profit from future price declines:

Suppose a stock is worth \$100, and you predict it will fall to \$70.

To sell the stock “short,” you do the following:

- *Borrow* a share from your broker, and sell it for \$100.
- Now you have \$100 proceeds from the sale, and a liability to deliver a share of the stock back to your broker in the future. This liability is called a “short position.”
- Reimburse the broker for any dividends that the stock pays.
- After the price falls, “close” your position by purchasing a share for \$70 and delivering that share to the broker.

Conclusion: You have earned \$30, exactly the amount of the price decline.

Basic observations about a short sale

Three fundamental observations about a short sale:

1. It offers the negative of the return on the investment.
2. The required investment (cash outflow) comes second.
3. The potential losses on the strategy are unlimited.

#2 and #3 create serious risk for the broker.

Now let's discuss these steps in more detail...

Margin requirements

The broker takes on risk by allowing you to sell short.

So the broker, and regulations, require you to post collateral.

Specifically, Regulation T requires that

1. when you open the trade, you deposit collateral with the broker worth 150% of the proceeds of the sale (initial margin);
2. after that, you must replenish the collateral whenever it falls below 130% of fair value (maintenance margin).

The law does not specify what form the collateral has to be.

But, the broker may require cash, or allow stock or other assets, depending on the investor, and on the asset being sold short.

Margin example for a retail investor

Redo the earlier example with typical retail margin requirements:

- You want to short-sell one share of stock worth \$100.
- To meet the 150% initial margin, you need \$150 of collateral.
Suppose you have no other investments. Then you need \$50.
- Deposit the \$50 with the broker, borrow the stock from them, sell it for \$100, and leave the combined \$150 with your broker.
- Suppose you don't earn interest on that \$150 in the meantime.
- One year later, you buy the stock for \$70, deliver it to close out your short position, and withdraw the \$150.

You started with \$50 and now have $\$150 - \$70 = \$80$, for a \$30 profit.

Margin calls during the year

Continuing the prior example:

- Suppose that during the year, the stock price rises to \$200.
- Your collateral requirement is now 130% of \$200, which is \$260.
- Your broker will require you to deposit another \$110.
- As the price rises higher, the required collateral does too.
- If you don't meet the requirement, the broker will close out your position by confiscating the collateral and purchasing the stock.

This is a major risk of short-selling as a strategy.

Even if you are right about the long-run stock price, it may be very difficult to hang on long enough to realize that profit.

Fees and costs

The broker can charge you an interest rate for lending you the stock, varying with the supply and demand of the specific stock.

The broker might *pay* interest on the cash that you keep on deposit. This is more common for institutional investors.

As with the other strategies in this class, we will just focus on measuring before-cost performance.

So from this point forward, we will imagine a fund that receives the risk-free rate on cash deposited with the broker, and we will ignore any lower rates or offsetting fees as trading costs to be dealt with separately.

Dollar-neutral investment funds

Let's now imagine you set up a "dollar-neutral" investment fund:

This means it will hold equal dollar long and short positions.

You raise \$100 from investors, buy \$100 of stock, short-sell another \$100, and keep the short sale proceeds with the broker.

- To cover the extra \$50 margin, you place half of the \$100 stocks purchased long in a specially-designated account.

Your initial balance sheet looks like this:

- Assets: \$100 of investments, \$100 of cash from short sale.
- Liabilities: \$100 short position, \$100 net assets.

One useful measure for a fund like this is "gross leverage," the sum of long and short positions divided by net assets.

- A dollar-neutral strategy has gross leverage of 2.

Vanguard Market Neutral fund balance sheet, 12/31/23

(\$000s, except shares, footnotes, and per-share amounts)	Amount
Assets	
Investments in Securities, at Value ¹	
Unaffiliated Issuers (Cost \$428,238)	472,762
Affiliated Issuers (Cost \$14,349)	14,349
Total Investments in Securities	487,111
Investment in Vanguard	17
Cash	203
Cash Segregated for Short Positions	475,892
Receivables for Investment Securities Sold	3,523
Receivables for Accrued Income	1,276
Receivables for Capital Shares Issued	643
Total Assets	968,665
Liabilities	
Securities Sold Short, at Value (Proceeds \$438,415)	469,712
Payables for Investment Securities Purchased	5,591
Collateral for Securities on Loan	1,686
Payables for Capital Shares Redeemed	320
Payables to Vanguard	42
Accrued Dividend Expense on Securities Sold Short	460
Total Liabilities	477,811
Net Assets	490,854

VMNFX discussion of short sales

2. Short Sales: Short sales are the sales of securities that the fund does not own. The fund sells a security it does not own in anticipation of a decline in the value of that security. In order to deliver the security to the purchaser, the fund borrows the security from a broker-dealer. The fund must segregate, as collateral for its obligation to return the borrowed security, an amount of cash and long security positions at least equal to the market value of the security sold short. In the absence of a default, the collateral segregated by the fund cannot be repledged, resold or rehypothecated. This results in the fund holding a significant portion of its assets in cash. The fund later closes out the position by returning the security to the lender, typically by purchasing the security in the open market. A gain, limited to the price at which the fund sold the security short, or a loss, theoretically unlimited in size, is recognized upon the termination of the short sale. The fund is charged a fee on borrowed securities, based on the market value of each borrowed security and a variable rate that is dependent upon the availability of such security, and the fund may receive a portion of the income from the investment of collateral which offsets the borrowing fee. The net amounts of fees or income are recorded as borrowing expense on securities sold short (for net fees charged) or interest income (for net income received) on the Statement of Operations. Dividends on securities sold short are reported as an expense in the Statement of Operations. Cash collateral segregated for securities sold short is recorded as an asset in the Statement of Assets and Liabilities. Long security positions segregated as collateral are shown in the Schedule of Investments.

VMNFX discussion of collateral

Long security positions with a value of \$333,913,000 are held in a segregated account at the fund's custodian bank and pledged to a broker-dealer as collateral for the fund's obligation to return borrowed securities. For so long as such obligations continue, the fund's access to these assets is subject to authorization from the broker-dealer.

Using a dollar-neutral strategy to earn a return spread

Suppose you have identified two groups of stocks H and L.

You think H will outperform L, and want to earn the spread $r_H - r_L$.

You raise \$100 from investors, and buy \$100 of the H stocks.

You short-sell \$100 of the L stocks, and leave the proceeds as cash with your broker, earning r_f .

Meet any further margin needs with stocks from the H portfolio.

As described earlier, your initial balance sheet would show net assets of \$100.

One year later, your balance sheet now looks like this:

- A: $\$100 \times (1 + r_H)$ investments, $\$100 \times (1 + r_f)$ cash.
- L: $\$100 \times (1 + r_L)$ short,
 $\$100 \times (1 + r_f)$
 $+ r_H - r_L$
net assets.

Your investors' excess return per \$1 is exactly $r_H - r_L$.

Conclusion: Return spreads are investable strategies.

Dollar-neutral vs market-neutral strategies

Dollar-neutral means investing equal dollars long and short.

Market-neutral means aiming for beta to be low or zero.
A dollar-neutral strategy will not necessarily achieve this.

In practice, market-neutral funds are more common.

Morningstar tells us that VMNFX has a beta of 0.01.

Principal Investment Strategies

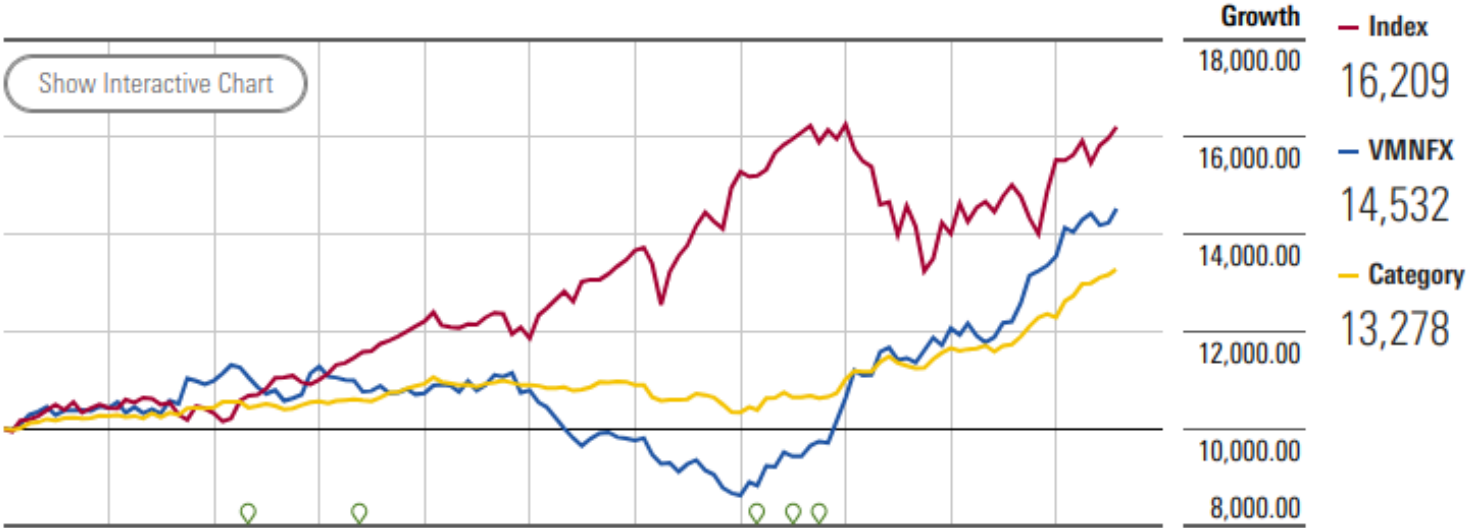
The Fund follows a market neutral strategy, which the Fund defines as a strategy designed to produce a portfolio that is neutral with respect to general stock market risk (sometimes referred to as beta neutrality). Beta is a measure of a portfolio's volatility relative to the volatility of the general stock market. The Fund, as a whole, does not seek to adhere to any other definition of market neutrality.

Growth of 10,000

- Investment
- Category
- Index
- Investment Flows

Manager Change

- Full
- Partial



Distinguishing two effects of short sales

Short-selling can accomplish two distinct goals for you as a fund manager:

- Allows you to construct pure bets on price declines, or on relative spreads between returns of different securities.
- Provides **leverage**, if you use the short sale proceeds to purchase more securities. This allows you to amplify your exposure beyond the capital that investors provided, when you

In practice, funds typically use short-sale proceeds to buy more securities, so in practice both of the above effects are typically present for a fund that engages in short sales.

However, in our course, we mainly care about the first effect and want to set aside the second.

For this reason, we will focus on strategies that retain the short-sale proceeds as cash, rather than using them to buy more securities. This is the only approach that does not create leverage.

And as we have seen, there are market-neutral funds that do actually operate this way.