

Practice Note

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The Mechanics of Porting the Returns of a Market Neutral Hedge Fund

ISSUE

Overlaying a market neutral hedge fund with equity index futures is often cited as a basic form of portable alpha, but with little or no explanation of the operational nuances involved. This Practice Note explains those nuances, including the implication of infrequent valuations common with most hedge funds.

RESPONSE

1. Collateral requirements associated with the futures overlay reduce the amount that can be invested in the underlying alpha engine (i.e. a "market-neutral" hedge fund).
2. Changes in the value of the hedge fund require a corresponding adjustment to the futures overlay (adding futures if the hedge fund value rises, or removing futures if the hedge fund value falls).
3. Changes in the value of the futures overlay is self-correcting and does not require a futures trade.
4. The absence of market risk in a "market-neutral" hedge fund should not be taken for granted. Any market exposure embedded in the hedge fund will result in leverage if the overlay is not properly structured.
5. Most hedge funds are valued no more often than monthly. Because of this, leverage can be

introduced between valuation dates, but can not be detected until the next valuation.

BACKGROUND

In concept, a market-neutral hedge fund that invests in equities maintains no net exposure to systematic equity market risk. The systematic exposure (but not the active exposure) of such a hedge fund is effectively to cash, and is undesirable in most asset allocations. An investor can eliminate this effective cash exposure by purchasing equity futures contracts with a notional value equal to the amount of assets allocated to the hedge fund.

Mechanics to Initiate an Overlay with S&P 500 Futures

Futures exchanges require the posting of collateral in proportion to the number of futures contracts held. While the amount of collateral required varies by contract, a good estimate for most equity contracts is 5% of the notional value of the contracts held.¹ Investors are allowed to post this collateral in the form of short-term Treasuries, so as to earn interest on the amounts posted.

In addition, most investors maintain a separate buffer of highly liquid securities from which variation margins (i.e. the daily gains/losses on futures positions) are paid or received. The level of this buffer is a function of the investor's access to cash. Investors who have other

¹ Required collateral is generally much lower for futures on fixed income securities than equities.

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sources of liquid cash could avoid a separate buffer altogether, while those for which liquidity is an issue should hold a buffer sufficient to absorb a significant loss in the futures positions held. This buffer is often held in a separate account to limit the funds available to the overlay manager. Generally, a buffer of 10% of the notional value of the contracts entered into is adequate.

The result of holding funds back for collateral requirements and a margin buffer is to reduce the amount that can be invested in the hedge fund. This is graphically illustrated in Exhibit 1. In the example illustrated in the exhibit, only 85% of assets targeted for alpha are actually invested in the alpha engine.

When margin and buffer take up 15% of assets, the return series generated from \$100 allocated to the market-neutral hedge fund “ported” to US equity is

$$\text{Return} = (85\% * \text{Hedge Fund Alpha}) + (100\% * \text{S\&P 500})^2$$

Ongoing Maintenance of a Futures Position

The best way to illustrate the mechanics associated with the daily maintenance of a futures position is to walk through the various return scenarios described in the table that follows:

Scenario	Hedge Fund	Futures Overlay
1	Up 10%	Flat
2	Down 10%	Flat
3	Flat	Up 10%
4	Flat	Down 10%

Starting Position. Recall, that to begin with, the value of the hedge fund is \$85 and the value of the collateral and margin buffer is \$15. This entire \$100 is overlaid with futures to provide market exposure. To make each scenario easier to follow, we’ll assume the cash return is zero so the values of the collateral and margin buffer remain unchanged at \$15 over the period examined.

² More specifically, the hedge fund generates a cash return on \$85 and an alpha (positive or negative) on \$85, the S&P 500 futures provides a return equivalent to the S&P 500 index less LIBOR on \$100, and the collateral and margin buffer would earn a cash return on \$15. The net result is a cash return on \$100, a futures return on \$100 (which combined is equivalent to the S&P 500 cash index return on \$100) plus the hedge fund alpha over cash on \$85.

Scenario 1 – Hedge fund up 10%, Overlay flat. In this case, the value of the hedge fund increases by 10% from \$85 to \$93.50. Therefore, the aggregate portfolio is worth \$108.50 (including \$15 in collateral and margin buffer). The value of the overlay is unchanged at this point at \$100 because the equity market was flat. Therefore, we are underexposed to the market. To keep market exposure over the entire portfolio, we would need to purchase an additional \$8.50 in futures. There would also be some cash movements between the variation margin buffer and the collateral account.

Scenario 2 – Hedge fund down 10%, Overlay flat. Here the value of the hedge fund decreases from \$85 to \$76.50. Adding in the value of the collateral and margin buffer brings the aggregate portfolio to \$91.50 (\$76.50 + \$15). The value of the overlay is unchanged at \$100. Therefore, we are overexposed to the market and need to sell \$8.5 in futures.

Scenario 3 – Hedge fund flat, Overlay up 10%. Here the value of the hedge fund remains at \$85 but the gain on the futures position has resulted in a positive variation margin of \$10 which increases the value of the margin buffer to \$20 (the original \$10 plus the \$10 from the variation margin). The aggregate portfolio is now worth \$110 (\$85 + \$20 + \$5) as is the value of the futures overlay which went up 10%, so there is no trade required. In essence, the variation margin is “self-adjusting” in that as the value of the futures changes, so does the value of the margin buffer and consequently the value of the aggregate portfolio. Note that the “alpha dampening” effect described above becomes more pronounced in this scenario.

Scenario 4 – Hedge fund flat, Overlay down 10%. Similarly, in this case the value of the hedge fund remains at \$85 but the loss on the futures position has resulted in a negative variation margin of \$10 which must be paid out of the margin buffer, depleting it to 0. The aggregate portfolio is now worth \$90 (\$85 in the hedge fund and \$5 in collateral) as is the value of the futures overlay, so there is no trade required.

Implications of Infrequent Valuations. As described above, adjusting the size of the overlay is necessary at each valuation point so that it matches the amount invested in the aggregate portfolio. At the time of adjustment, there is no leverage. Most hedge funds,

however, are valued monthly. The value of the hedge fund can fall during the month, dragging the overall value of the aggregate portfolio below the value of the overlay. While officially the position is not leveraged (how would you know if the hedge fund isn't valued?), the investor would nonetheless be exposed to leverage. The existence and degree of which could not be identified until the hedge fund was next valued.

RELATED READING

Gardner, Grant W. 2004. "Policy Portfolios and Portable Alpha." *Russell Research Report* (July).

Gardner, Grant W. and Thomas, Michael D. 2004. "Portable Alpha Part I; Mechanics, Costs, and Impacts on Performance." *Russell Viewpoint* (Forthcoming).

EXHIBIT 1
Impact of Collateral and Margin Buffer Requirements

