# Does a mean reversion strategy really work?

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# The answer

### The question
Some investors seem to be doing well with a mean reversion strategy, while others are disappointed. Is this because the basic assumptions of the strategy are false? And the successful investors simply lucky? Or is there a systematic relationship between the valuation level at which a fund trades and its subsequent return? Such that if a fund sells at a valuation considerably below its mean, one can expect to earn excess returns as the fund's valuation returns to its average level? Whereas if a fund trades significantly above its average valuation, an investor can expect to earn returns lower than those associated with its typical valuation?
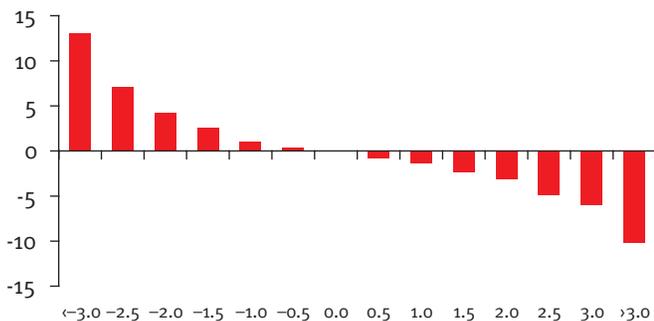
### The answer
Figure 1 throws some light on this question. It shows the average 3-month price return less net asset value (NAV) return for funds trading at different valuation levels.

**What is most striking here is not only that the undervalued funds should generate larger relative price returns than the overvalued funds, but rather the uniform increase in the funds' price return, relative to their own NAV return, strictly as the initial premium contracts or discount widens.**

In other words, the valuation of both the cheap and the dear funds reverts to its mean. And it does so in precise correspondence to the degree of the funds' over or undervaluation. Hence, the larger the discount at which a fund trades, the higher, on average, its price relative to NAV return over the following three months.

### Outperformance?
The same tight connection between a fund's valuation level and its subsequent price relative to NAV return holds for its price relative to its index return, as figure 2 demonstrates.

Again there is the striking correspondence between funds' valuation level and their performance relative to their index over the subsequent three months. The undervalued funds (from 0.5 standard deviations below the mean on) not only consistently outperform their indices, but by how much they outperform them is strictly a function of how undervalued they are. Likewise, the overvalued funds not only consistently underperform their indices, by how much they underperform is (with one exception) strictly a function of how overvalued they are.

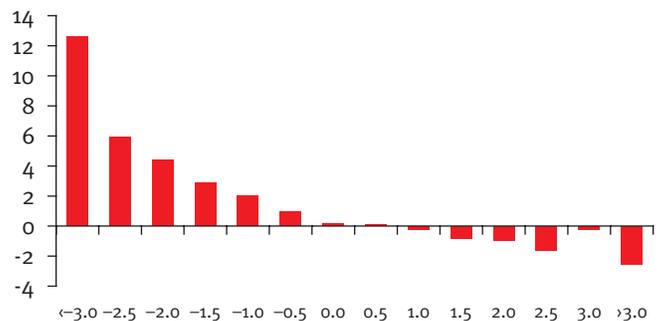### It pays to use funds even at modest levels of undervaluation
Thus, even at relatively modest levels of undervaluation, it pays to use funds, rather than 'buying the market'. The reason is that using even these only modestly undervalued funds for asset allocation, for example, can, on average, add several hundred basis points per year to a manager's performance.

### Two qualifications
So, the short answer to our title question is: Yes. But there are two important qualifications:
- One, it doesn't work for all funds. After all, the data presented are for fund averages.
- Two, the group of funds for which it works best changes continually. So it becomes critical to monitor the universe on an ongoing basis, to make sure that this strategy is being applied to the right funds. Otherwise, one may get the mistaken impression that the strategy is not working, whereas, in fact, a perfectly fine strategy is being applied to the wrong funds.

**Figure 1 Price return less NAV return (%): 3-months (US$)**



Discount/premium range: number of standard deviations below (–) or above (+) the 52-week mean

**Figure 2 Price return less index return (%): 3-months (US$)**



Discount/premium range: number of standard deviations below (–) or above (+) the 52-week mean

# Summary

**Part I deals with three related questions**

▸ Do the discounts of substantially undervalued funds narrow and, if so, over what time period?

▸ Do substantially undervalued funds outperform their indices on a price basis?

▸ Do undervalued funds generate significant absolute returns?

**Section 1: Narrowing Discounts?**
It turns out that there is, in fact, a very close relationship between a fund's valuation and its subsequent 3-months' price return. What is most striking is the uniform increase, on average, of a fund's 3-months' price return relative to its NAV return, strictly as a fund's discount widens or its premium contracts.

**The cheaper, the better?**
Thus the cheaper a fund, the bigger the fund's price outperformance of its NAV return; and the more expensive a fund, the more its price return falls short of its NAV performance. This is a direct reflection of the narrowing discounts of the undervalued funds and the expanding discounts or contracting premiums of the overvalued funds.

**How soon?**
Almost all of the gains as a result of discount narrowing occur within the first three months after a fund trades at a given valuation level. In fact, for most valuation levels, funds lose some of their gains again after three months. NY-listed, SEC-registered funds revert even more quickly to their 52-week average discount/premium than the non-SEC-registered funds. Hence it is even more important to sell NY-listed funds within three months.

**Absolute premium funds**
Contrary to a widely held view, there is no reason to believe that funds trading at an absolute premium will not generate excess returns as attractive as those produced by funds trading at absolute discounts, as long as the absolute premium funds are trading at substantial relative discounts to their 52-week average discount/premium.

**Section 2: Index outperformance?**
The relationship between valuation and subsequent price relative to NAV return is almost precisely mirrored in the connection between a fund's valuation and its subsequent 3-months' price return relative to the index.

Thus, on average, funds with discounts in excess of 1 standard deviation below their 52-week average discount/premium outperform not only their own NAV, but also their target market. And the degree of index outperformance is strictly a function of the degree of a fund's undervaluation.

Again almost all the gains come within the first three months. Consequently, a consistent strategy of investing in the most undervalued funds and selling fairly valued and overvalued funds is likely to prove rewarding.

**Section 3: Positive absolute returns?**
So far we have seen that undervalued funds' discounts narrow and that they outperform their indices. The question now is, 'Do they also produce positive absolute returns?' It could be, for instance, that when funds sell at depressed levels, markets decline subsequently. In that case, funds' discount/premium levels might be a good market indicator. But equally, while funds' subsequent returns might still surpass their indices, they would then be predominantly negative.

This does not turn out to be the case, however. The average 3-months' price return of all funds in our universe trading at a discount of 2 standard deviations or more below their 52-week average is a respectable 5.9% vs the average index return of 1.3%. (The corresponding return for our recommended funds is considerably higher.)

**Part II examines three strategies for implementing the general results of Part I**

**Section 4: Short-term discount/premium rebound strategy**
**What to look for?**
We take a closer look at our recommended funds for a short-term discount/premium strategy (strategy 1) and consider what makes these funds attractive. In particular, their price performance relative to their own NAV and their target market, for different ranges of over and undervaluation, as well as their absolute price returns, and their consistency in generating buy signals producing positive returns.

We also look at their discount/premium volatility and, in particular, their price volatility relative to their NAV volatility. This measure compared with the volatility of a fund's 52-week average discount/premium is a good indicator of a fund's suitability for this strategy, since it reflects the extent to which the fund's discount/premium swings around its 52-week average. In addition, we glance at the funds' beta and correlation with their index.

**Results: narrowing discounts, index outperformance, strong absolute returns, and modest risk**

The recommended funds' average price relative to NAV return for the three-month holding period following a buy signal at 2 standard deviations below the 52-week average is a huge 11.6%.

The recommended funds' average absolute 3-months' price return is 14.7% vs 3.7% for the target markets. As with our universe as a whole, the more undervalued a fund, the higher its return three months later. The recommended funds outperform massively. And they do so with virtually the same risk as the target market. The main difference between our universe as a whole and the recommended funds is the magnitude of the outperformance, especially at undervaluation levels at or greater than 1 standard deviation below the 52-week average. The recommended funds outperform their own NAVs and their indices by a substantially wider margin than the average fund in our universe.

## Section 5: Long-term big discount plays

Another group of funds offering attractive returns trade at very large discounts (35%+) for a considerable period of time. We looked at this group's returns for the six, 12, 18, and 24 months following a buy signal generated after a fund had been trading for at least six months at discounts of 35% or greater. The biggest payoff came after 18 and 24 months, at which points their price relative to NAV returns were 40% and 52% respectively. These funds outperformed their target market by 37.6% after 18 months and a whopping 57% after two years.

**Even illiquid funds can be good candidates**

Since it takes at least six months before these funds show any appreciable outperformance of the index, there is ample time for accumulating shares. Thus even a fund which does not trade a great deal can be a promising candidate for this strategy.

**Discounts between 30% and 35%**

Funds trading at discounts between 30% and 35% for at least six months also turned out to be rewarding investments. The optimal holding period for this group is 12 months, over which the funds' price returns surpassed their NAV returns by more than 11.7% and their indices by 14.5%.

**Risk?**

How risky are these investments? For the group trading at a discount of 35% or more for at least six months: If we restrict our universe to funds with at least 50% of their total assets in listed equities, there is no fund, after two years, which underperformed its index.

This groups' average index outperformance was a huge 65.3%. Of the funds trading at discounts between 30% and 35%, there are only two cases out of 14 where they underperformed their indices after 12 months, and only by a narrow margin.

**Catalyst?**

What is likely to trigger discount narrowing of the long-term big discount group? Possible catalysts include: shareholder activists getting involved, value players, closed-end fund specialists, asset allocators looking for undervalued vehicles. The management house may adopt a share buy-back programme, as many have. It may also conduct a tender offer or a reverse rights issue, allowing shareholders to receive cash at NAV for (some of) their shares.

**Potential return is huge**

Any cash payout will constitute a much higher return on the fund shares than on the underlying portfolio. Shareholders or activists may be able to bring sufficient pressure on the management house to open-end or liquidate the fund. For a fund selling at a 40% discount, this works out to a 67% excess return! On balance, buying a fund at, say, a 40% discount is a decidedly good idea.

## Section 6: Spread trades

**Templeton Emerging Markets**

The motivation for spread trades is to eliminate, or greatly reduce, market risk, so that the only risk left is that the discount/premium moves the wrong way. But since we are buying a fund at a significant discount and selling (short) at a substantial premium, this risk is already minimized.

A good example of a successful spread candidate is the pair Templeton Emerging Markets Fund Inc. (EMF.N) and Templeton Emerging Markets Investment Trust (TEM.L). The average return on this trade, going long EMF.N and short TEM.L, at 2 standard deviations below the 52-week average spread discount, has been 10.8% for the three month period following a buy signal.

**Japan OTC**

The contrast between this pair and the JF Japan OTC Fund and the Japan OTC Equity Fund is telling. The latter is a much riskier trade because a great deal less of market risk has been eliminated. The reason is that the two Japan funds' beta is extremely volatile, fluctuating within a short time period between 0.5 and 2.0. This makes it very likely that the two funds' NAVs will behave very erratically. Hence they won't provide a good hedge for each other.

Spread candidates are the ideal vehicles for a mean reversion strategy. Unfortunately, good spread candidates are hard to find. And borrowing suitable funds to short is not always easy either.

# Recommended strategies

## Short-term discount/premium rebound strategies

### Strategy 1

**Buy the recommended funds at a discount of 2 standard deviations or more below their 52-week average. Sell after three months.**

### Strategy 2

**Buy the recommended funds at a discount of 1 standard deviation or more below their 52-week average. Sell after three months. Reinvest in another fund trading at 1 standard deviation or more below the 52-week average.**

Strategy 2 is appropriate for a broader group of investors. While strategy 1 will generally produce higher returns, it also generates fewer buy signals. Thus, for an investor who wants to use a broad range of country funds for asset allocation purposes, for example, this strategy is more useful. There will be substantially more buy signals and the investor can still expect to outperform the target market by an appreciable margin. Investors who use this strategy can, of course, also selectively employ Strategy 1, thereby further increasing their index outperformance.

## Long-term, large discount strategies

### Strategy 3

**Buy equity funds which have been trading at a discount of 35% or more for at least six months. Hold these for 18–24 months. Then sell.**

Very conservative investors may want to eliminate funds with less than 50% of their assets invested in listed stocks. This will further reduce the risk of these trades.

### Strategy 4

**Buy equity funds which have traded for at least six months at discounts between 30% and 35%. Hold for 12 months. Then sell.**