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July 9, 2007

Portfolio Strategy

ACTIVE 130/30

CONTRACTIONS

Moving Long/Short

Strategies into 130/30 Space

Managers of long/short (L/S) funds may be able to expand their asset base into the growing market for Active Extensions (AE) without overly disrupting their alpha-intensive/beta-agnostic style.

The standard AE consists of “extensions” of long-only portfolios that have 1) a net long exposure of 100%, 2) a beta of one, and 3) a moderate tracking error (TE). These risk constraints enable AE's to be funded from the basic allocation to domestic equities — a key factor in AE's evident appeal.

In contrast to a long-only's “extension” into the AE format, an L/S manager would generally have to “contract” its short portfolios to achieve 100% net exposure.

The TE change accompanying L/S contractions will depend on the correlation/factor effects. With fully independent positions, the contraction in gross footings tends to lower the TE. However, with correlated positions, the TE may increase due to contraction in the offsetting short positions.

L/S managers who consider themselves to be “beta-agnostic” may nevertheless have relatively limited levels of “beta volatility.” One rather surprising finding is a formula that suggests that such beta volatilities will have only a modest impact on the fund's TE and total volatility.

Compared with the standard AE, an L/S contraction may have greater TE's due to its more intense alpha-seeking structure. If the prospective alphas can be viewed as a tradeoff for the higher TE, then the L/S contraction may qualify as an expanded AE with access to the mainstream equity allocation as a funding source.

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ACTIVE 130/30 CONTRACTIONS:

Moving Long/Short Strategies into 130/30 Space

Summary & Conclusions

Long/Short (L/S) equity funds are generally placed in the alternatives allocation bucket as opposed to the traditional equity portion. One reason for this placement is the potential for wide variability in their long, short, and net exposures. In fact, many L/S funds have relatively stable exposures over significant periods, but it is their freedom to change these levels that restricts them to the alternatives allocation. This Note addresses how L/S strategies can be 'contracted' into active extension (AE) formats in order to be relocated within the traditional equity bucket.

The short portfolio exposure is likely to undergo the most significant change in the transformation of an L/S fund into an AE with a 100% net long exposure. For the average L/S fund, the long exposures would increase somewhat to the 130-140% region, while the short exposures would decline from 50-60% to 30-40% [1,2].

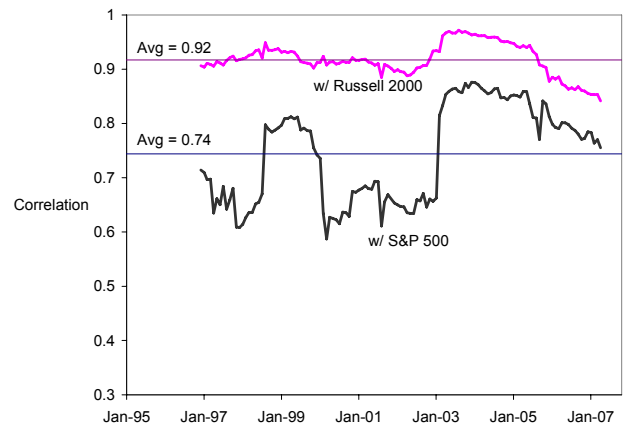
L/S managers who view their movements in beta as a positive source of return may be reluctant to move to AE-type levels of beta control. However, for L/S managers whose primary alpha sources are security and sector selection, it may be quite feasible to preserve their basic investment process while expanding into new AE mandates. The advantage of such AE treatment is the opportunity to move beyond the alternatives category and access the more flexible funding available within the mainstream equity allocation.

MSCI Long/Short Fund Analysis

Exhibit 1 presents a time series of the rolling 36-month correlations for the MSCI Index of Long Bias (LB) hedge funds. These are essentially L/S funds with varying degrees of net long exposures.

Exhibit 1

36 Month Rolling Correlation between MSCI Long Bias Index and S&P 500/Russell 2000: 1994-2007



Source: Morgan Stanley Research

The correlation vs. the S&P 500 has varied between 0.59 and 0.88 with an average of 0.74. This correlation has come down from its 2003-2005 high recently and currently stands near its historical average. As a point of comparison, the LB correlation vs. the Russell 2000 averaged 0.92 over the same period and has been much more stable. An earlier report presented a more detailed analysis of these historical risk characteristics [3,4].

Exhibit 2 presents the beta values relative to the S&P 500, again based on rolling 36-month periods. With the exception of recent months, the beta has ranged between 0.4-0.6 with an average of 0.54.

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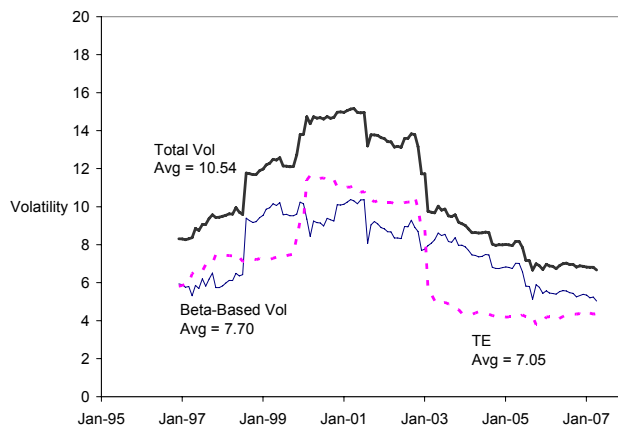
Exhibit 2
MSCI Long Bias Beta Relative to S&P 500: 1994-2007



Source: Morgan Stanley Research

Exhibit 3 breaks down L/S total volatility into two components: 1) beta-based volatility and 2) tracking error (TE) above and beyond this beta effect. The beta-based volatility is the product of the beta values from Exhibit 2 and the equity volatility. The TE is the independent source of risk that is uncorrelated with the beta risk within a given period. The TE has ranged from 4-12% with an average of 7.05%.

Exhibit 3
L/S Volatility Breakdown



Source: Morgan Stanley Research

These historical statistics are limited in scope and are subject to the well-known problems of any hedge fund index. However, they serve as guidelines for developing the characteristics of an illustrative L/S fund for our analysis.

Moving from L/S into AE

Our plan is to present an example of how an L/S fund might shift its exposures to come within the basic AE guidelines. The analytic focus will be how the necessary L/S contraction alters the TE and then to compare the result with the more standard AE. At the outset, it should be pointed out that L/S funds come in many different forms with very complex volatility characteristics. For the following analysis to have any degree of clarity, it proved necessary to make a number of simplistic assumptions. For example, the L/S funds are treated as being fully active, compared with only a 60% active level for the original long-only fund.

With these caveats in mind, Exhibit 4 presents an example of how an L/S strategy can be moved towards the AE format. For all portfolios, the active positions are assumed to have a 3% weight, with a position-specific TE of 23%. In both cases, beta values are assumed to be directly proportional to the gross long and short weights.

Exhibit 4
L/S Fund vs. Active Extension

| | L/S | | Standard | |
|--------------------------------------|----------|------------|----------|------|
| | Original | Contracted | AE | LO |
| Long Portfolio | | | | |
| Gross Weight | 120% | 130% | 130% | 100% |
| Beta | 1.2 | 1.3 | 1.3 | 1.0 |
| Number of Active Positions | 40 | 43 | 30 | 20 |
| Activity Level | 120% | 130% | 90% | 60% |
| Short Portfolio | | | | |
| Gross Weight | 60% | 30% | 30% | |
| Beta | 0.6 | 0.3 | 0.3 | |
| Number of Active Positions | 20 | 10 | 10 | |
| Activity Level | 60% | 30% | 30% | |
| Total Portfolio | | | | |
| Gross Weight | 180% | 160% | 160% | 100% |
| Beta | 0.6 | 1.0 | 1.0 | 1.0 |
| Number of Active Positions | 60 | 53 | 40 | 20 |
| Activity Level | 180% | 160% | 120% | 60% |
| Uncorrelated TE's Relative to | | | | |
| Portfolio Beta | 5.34 | 5.04 | 4.36 | 3.09 |
| Beta = 1 | 8.04 | 5.04 | 4.36 | 3.09 |

Source: Morgan Stanley Research

As shown in the first column, the L/S fund starts with a 120% long weight and 60% short weight resulting in a net long exposure of 60% and a beta of 0.6. This hypothetical fund has forty 3% long positions and twenty 3% short positions. Without any correlations between the active positions, the LS fund's TE of 5.34% relative to its assumed beta benchmark of 0.6 is

simply computed as a total of 60 independent 3% positions, each with an alpha volatility/TE of 23%,

$$(.03)(23)\sqrt{60} = 5.34\%$$

The second TE in Exhibit 4 for the L/S fund is measured against the standard AE benchmark with a beta of one. For the original L/S, the total TE would now need to reflect the "beta gap" of 0.4 from 0.6 to 1.0. Assuming a 15% equity volatility for the benchmark, the total TE rises to:

$$\sqrt{(5.34)^2 + (.4 * 15)^2} = 8.04\%$$

The transformation of the L/S into an AE format would involve increasing the long weight from 120% to 130% and reducing the short weight from 60% to 30%. This would decrease the gross weights and the activity level from the original 180% to 160%. The number of short positions is reduced from 20 to 10 while the number of long positions increases from 40 to 43.3.

Assuming that the beta changed proportionally with the revised short and long exposures, the net exposure would rise from 60% to 100%, leading to the revised beta of one. Relative to this benchmark beta, with fully uncorrelated positions, the L/S contraction with its 53 positions would have an approximate TE of:

$$(.03)(23)\sqrt{53.3} = 5.04\%$$

With its reduced number of independent positions, this 5.04% TE is lower than the original L/S fund's 5.34% TE relative to its actual beta benchmark of 0.6.

Long-Only Extension to AE

Another point of comparison is to look at these TE's versus the standard long-only (LO) fund and its extension into an AE format. Our intent is to discriminate between the larger TE's for the more aggressive L/S versus the standard AE. Hence, our examples have been designed to exaggerate the L/S TE while giving the benefit of the doubt to the standard AE with its lower TE.

We need to recognize at the outset that the standard LO will generally be more sensitive to TE concerns and will not be as intensively active as the L/S fund. Our admittedly extreme example treats the LO as being 60% active in contrast to the full 100% activity level of the original L/S fund. Thus, the LO fund with only twenty 3% active positions would have a considerably lower TE:

$$(.03)(23)\sqrt{20} = 3.09\%$$

In moving to the standard 130/30 AE, both the 30% new shorts and 30% new longs are treated as fully active so that the TE rises to

$$(.03)(23)\sqrt{40} = 4.36\%$$

In this basic case with independent positions, the TE will be a function of the number and size of the active positions in the portfolio along with the individual TE of each position. Because the contracted L/S fund is fully active at 160%, its TE of 5.04% is slightly greater than the 4.76% TE for the standard AE with its less intense 120% activity level.

Beta Volatility in the L/S Fund

The preceding treats the L/S fund as having a tight target around its assumed average beta of 0.6. However, in general, L/S funds tend to be more "beta agnostic" and have betas that move around their average values. We model this variability around the assumed 0.6 average beta by having the realized beta value follow a normal distribution with a "beta volatility" of 0.1 or 0.2. The formula for computing the resulting total volatility is presented in the Appendix, and the numerical results are displayed in Exhibit 5 for the case of independent positions.

Exhibit 5

TE with Independent Positions ($\rho_L = \rho_S = \rho_{L,S} = 0$)

| | L/S | | | Standard | |
|-----------------|----------|----------|------------|----------|------|
| | Original | Original | Contracted | AE | LO |
| Beta Benchmark | 1.0 | 0.6 | 1.0 | 1.0 | 1.0 |
| Activity Level | 180% | 180% | 160% | 120% | 60% |
| Beta Volatility | | | | | |
| 0 | 8.04 | 5.34 | 5.04 | 4.36 | 3.09 |
| 0.1 | 8.20 | 5.60 | 5.30 | | |
| 0.2 | 8.69 | 6.29 | 6.03 | | |

Source: Morgan Stanley Research

It is most striking that even as the beta volatility moves from 0 to 0.1 and then to 0.2, there is a sizable but not huge increase in the TE for both the original and contracted L/S funds.

As noted earlier, our approach in this comparative study is to magnify the TE spread between the L/S contraction and the standard AE. In this spirit, the standard AE is treated as having

a beta volatility of 0 and a TE of 4.36%, versus an assumed 0.1 beta volatility for the contracted L/S that leads to a 5.30% TE.

Correlation and Factor Effects

All of the preceding examples were based on the presumption of fully uncorrelated positions within each fund. As we move to the correlated situation, the results become somewhat more complicated. The formula for computing the correlated TE can be found in the Appendix.

Exhibit 6 displays the total TE for a 0.05 correlation within the long and within the short portfolios and a -0.05 offset correlation between the longs and shorts. This ability to create offsets for unproductive correlations can be an important benefit from short portfolios in both the L/S or AE formats. Without these offset effects, the TE's would be considerably larger for both the standard AE and the contracted L/S funds.

Exhibit 6

TE with Correlated Positions

$$(\rho_L = \rho_S = 0.05/\rho_{L,S} = -0.05)$$

| | L/S | | | Standard | |
|-----------------|----------|----------|------------|----------|------|
| | Original | Original | Contracted | AE | LO |
| Beta Benchmark | 1.0 | 0.6 | 1.0 | 1.0 | 1.0 |
| Activity Level | 180% | 180% | 160% | 120% | 60% |
| Beta Volatility | | | | | |
| 0 | 8.52 | 6.05 | 7.11 | 5.25 | 4.31 |
| 0.1 | 8.68 | 6.28 | 7.30 | | |
| 0.2 | 9.14 | 6.90 | 7.84 | | |

Source: Morgan Stanley Research

In contrast to the earlier situation in Exhibit 5, the L/S TE in this correlated case now increases significantly as the L/S fund contracts its short positions. This is due to the loss of short positions with their offsetting correlations.

The contracted L/S with 0.1 beta volatility has a TE of 7.30%, roughly comparable to the historical average TE of 7.05% shown in Exhibit 3 for the MSCI Index. This 7.30% TE is 39% greater than the corresponding 5.25% for the standard AE. Hopefully, the higher L/S TE would be compensated by a greater alpha potential inherent in the L/S 160% activity level, which is 33% greater than the standard AE's 120%.

The TE gap in our example may be somewhat exaggerated due to our choice of extreme assumptions. With the L/S's more intense levels of activity, one should generally expect L/S contractions to have higher TE's than the standard AE. It is an open question whether the greater alpha potential associated

with these higher TE's will enable a simple L/S contraction to be accepted as a form of AE.

Total Fund Volatility

In Exhibit 7, the total volatility for each fund is shown, including the effects from an assumed benchmark volatility of 15%. It is striking how close these total volatilities are for both the L/S contractions and the standard AE. Basically, the beta volatility so dominates the TE's that there is little difference across these total volatility values as a gauge of risk.

Exhibit 7

Total Volatility with Correlated Positions

$$(\rho_L = \rho_S = 0.05/\rho_{L,S} = -0.05)$$

| | L/S | | | Standard | |
|-----------------|----------|----------|------------|----------|-------|
| | Original | Original | Contracted | AE | LO |
| Beta Benchmark | 1.0 | 0.6 | 1.0 | 1.0 | 1.0 |
| Activity Level | 180% | 180% | 160% | 120% | 60% |
| Beta Volatility | | | | | |
| 0 | 16.18 | 13.10 | 16.60 | 15.89 | 15.61 |
| 0.1 | 16.26 | 13.21 | 16.68 | | |
| 0.2 | 16.51 | 13.51 | 16.93 | | |

Source: Morgan Stanley Research

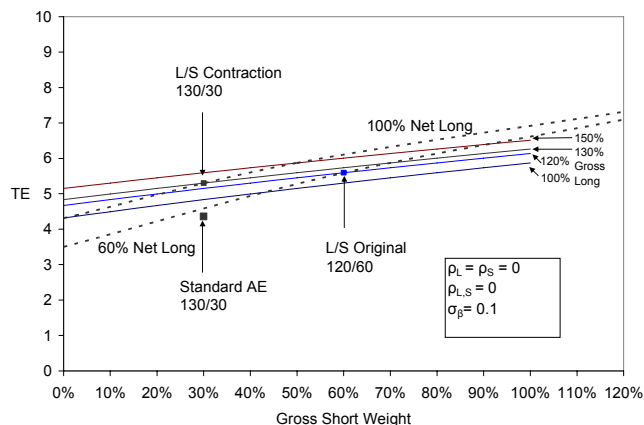
Moreover, if we were to consider the total volatility effect within the overall fund context, we would find that the TE distortions would virtually disappear. For example, in an institutional fund with the typical 0.6 effective beta [5], the total fund volatility would only be increased by 10-20 bps from a 20% allocation to these strategies [1]. Most institutional funds have low levels of active risk, and such TE's from AE's that are reliably orthogonal to the dominating beta risk will have a minimal impact on the overall fund volatility.

Various Long/Short Combinations

Exhibit 8 plots the TE vs. a range of short weights for gross long exposures of 100%, 120%, 130% and 150% for uncorrelated positions and an L/S beta volatility of 0.1. Each solid line corresponds to a given long weight while the short weights are displayed on the horizontal axis. Thus, the solid lines provide the TE's associated with a variety of long/short combinations beyond our earlier examples of 120/60 and 130/30 L/S funds.

Exhibit 8

TE with Independent Positions for Different L/S Portfolios



Source: Morgan Stanley Research

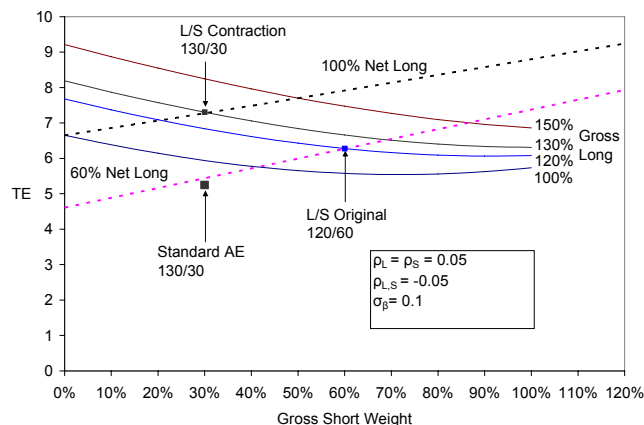
The lower dotted line represents L/S funds having long/short combinations that result in a 60% net exposure. The original 120/60 L/S fund is shown as a marked position on this line. Similarly, the higher dotted line represents L/S funds with the 100% net long exposure required for the AE treatment. The mark on this line corresponds to the 130/30 L/S contraction used in our example. The TE position for the standard 130/30 AE is also displayed.

Exhibit 8 makes graphically clear how little the TE shifts as the L/S fund contracts from 60 to 43 uncorrelated positions. The resulting TE of 5.30% is within reasonable bounds of the TE range for standard AE's.

However, the TE situation becomes more divergent when one moves to the correlated case as shown in Exhibit 9. Recall that the lower short weight reduces the offset effect in the L/S funds, so that the contracted TE moves up to 7.30%.

Exhibit 9

TE with Correlated Positions for Different L/S Portfolios



Source: Morgan Stanley Research

These TE's rise above the 3-6% TE targeted by standard AE's. However, given the dominating beta risk effect described earlier, even these higher TE's will not have a significant impact on overall fund volatility. For some sponsors, the L/S's more intense alpha hunting and greater return prospects may be considered sufficient compensation for loosening the TE constraint. In other situations, increased risk controls may be required for the L/S strategy to be incorporated within the AE classification.

Indeed, with shorting becoming a more accepted concept among institutional investors, a wide range of long/short strategies may migrate towards beta targeting as a pathway from the alternatives space to the mainstream equity allocation.

References:

- 1) Leibowitz, Martin L. and Anthony Bova. "Active 130/30 Extensions: Alpha Hunting at the Fund Level." *Journal of Investment Management*, forthcoming, Fall 2007
- 2) Leibowitz, Martin L. and Anthony Bova. "Position Structure of Active Equity Portfolios." *Portfolio Analysis Note*, October 4, 2006.
- 3) Leibowitz, Martin L. and Anthony Bova. "Beta-Based Analysis of Hedge Fund Returns." *Portfolio Analysis Note*, March 10, 2006.
- 4) Leibowitz, Martin L. and Anthony Bova. "Hedge Funds and Small Cap Betas." *Portfolio Analysis Note*, March 24, 2006.
- 5) Leibowitz, Martin L. and Anthony Bova. "Gathering Implicit Alphas in a Beta World." *The Journal of Portfolio Management*, Spring 2007
- 6) Leibowitz, Martin L. and Anthony Bova. "Beta Targeting: Tapping into the Appeal of 130/30 Active Extensions." *Portfolio Analysis Note*, April 20, 2007

Appendix

Incorporating Beta Volatility

In the earlier paper on Beta Targeting [6], the volatility of relative return — here designated simply as TE — was shown to be given by:

$$TE = \sqrt{(\Delta\beta\sigma_e)^2 + (ITE)^2 + \sigma_\beta^2[\sigma_e^2 + \bar{r}_e^2]}$$

Where

σ_β = beta volatility

$\Delta\beta$ = the beta gap, the expected difference between the portfolio and benchmark betas

σ_e = equity volatility

ITE = the intrinsic tracking error, i.e., the variation beyond any beta value at a given time.

In this paper, the average beta value is taken as the benchmark so, this formula reduces to:

$$TE = \sqrt{(ITE)^2 + \sigma_\beta^2[\sigma_e^2 + \bar{r}_e^2]}$$

Correlated TE's

For a uniform pairwise correlation ρ and a common specific volatility σ , the intrinsic tracking error for N active positions with weights ω_i is given by:

$$\begin{aligned} ITE^2 &= \sum_{i,j} \omega_i \omega_j \rho \sigma^2 \\ &= \sigma^2 \left\{ \sum_i \omega_i^2 + \rho \sum_{i \neq j} \omega_i \omega_j \right\} \\ &= \sigma^2 \left\{ \sum_i \omega_i^2 + \rho \left[\left(\sum_i \omega_i \right)^2 - \sum_i \omega_i^2 \right] \right\} \\ &= \sigma^2 \left\{ \sum_i \omega_i^2 + \rho \left[(N\bar{\omega})^2 - \sum_i \omega_i^2 \right] \right\} \\ &= \sigma^2 \left(\sum_i \omega_i^2 \right) (1 - \rho) + \sigma^2 \rho (N\bar{\omega})^2 \end{aligned}$$

where $\bar{\omega}$ is the average active weight.

For the case of all positions having the same weights, this expression reduces to the well-known result,

$$\begin{aligned} \text{ITE}^2 &= \sigma^2 N \bar{\omega}^2 (1 - \rho) + \sigma^2 \rho (N \bar{\omega})^2 \\ &= (\bar{\omega} \sigma)^2 \{N + N(N - 1)\rho\} \end{aligned}$$

Similarly, for the independent case when $\rho = 0$,

$$\text{ITE}^2 = \sigma^2 \left(\sum_i \omega_i^2 \right)$$

or when all $\omega_i = \bar{\omega}$,

$$\text{ITE}^2 = N(\bar{\omega} \sigma)^2$$

and

$$\text{ITE} = \sqrt{N}(\bar{\omega} \sigma)$$

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July 9, 2007

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