Case Studies of CTA Assessment Using the Omega Performance Measure

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In a recent paper we applied the new performance measure Omega to the assessment of CTA performance using a small sample of established managed futures advisors (Winton Capital Management 2003). We concluded that, owing to its superior handling of the higher moments of return distributions, Omega provides a superior return/risk measure to the more commonly used mean/variance metrics. In addition, the definition of a specific threshold value links this performance measure directly to the absolute demands of specific investor groups. In this paper, we follow up our initial assessment by focusing on specific case studies defined by the demands of pension funds and retail hedge fund products. In the final section of the paper we suggest an intuitive shortcut to Omega for similar return thresholds based on the Sortino ratio.

CASE STUDIES

Omega is defined as the probability-weighted ratio of gains over losses at a given level of return r (for a more detailed definition, see Keating and Shadwick 2002a, b). This level of return was defined by the originators of Omega as a “loss threshold”, the level below which, for a specific investor, even a positive return would be regarded as a loss. This level is not a target return; rather it is an absolute minimum or hurdle, determined by real life business concerns such as the cost of promoting an investment, or the growth demands, legal or actuarial, on a pension fund. This focus on absolute return thresholds is one of the most valuable components of Omega for two reasons.

In the first instance, it provides a much-needed injection of realism into the task of performance measurement. This is a component lacking in the conventional application of the Sharpe ratio, and even the Sortino ratio, where the hurdle used is the risk-free rate. Clearly, this is an abstraction which does not apply directly to any real investment situation, and is exacerbated by the recent prevalence of low interest rates.

In a more theoretical sense, the task of setting a minimum return threshold re-focuses our attention on *absolute return*, where the mechanistic use of mean/variance statistics had displaced attention to *risk minimization.* The point is not merely academic. An investor attracted in the first instance by a high Sharpe ratio may be falling prey to the behavioural bias described by prospect theory, by placing more value on minimizing losses than on maximizing gains. This mindset may have been an affordable luxury in the

bull market period; however, in the current economic conditions it is no longer reasonable to expect returns to take care of themselves.

Below, we examine a series of case studies where a level of absolute return on investment is strictly mandated either by law or by business demands. We will focus first on the requirements of pension funds, and then consider the fee hurdles of retail hedge fund products.

Pension Funds

Pension funds are a very structured type of investment situation, where performance is mandated by actuarial assumptions designed to guarantee the fund's ability to meet its liabilities at the time of employees' retirement. In strictly regulated regimes, a minimum actuarial assumption is enshrined in law. This is the case in Switzerland, where pension funds are required by law to provide returns of 3.25% annually, while in other cases the threshold can be inferred from regulatory minimal funding requirements.

These are minimal requirements. Other considerations, not directly related to liabilities, may also influence the enforcement of a performance hurdle. Attention has been focused in recent years on the contribution of projected pension plan revenue to the income statements of listed companies. During the bull market, pension credits contributed substantially to reported earnings, based on projected returns of 9%-10% per annum. More recently, the situation has reversed, with pension fund liabilities absorbing large amounts of cash from companies' balance sheets and dragging down earnings. Corporations that project high earnings on their pension schemes are therefore setting themselves a considerable challenge which will have a direct impact on their reported earnings. Recent projections have been dampened somewhat, with 8% being the number favoured by corporations such as IBM and Citigroup. A vocal critic of this scheme, Warren Buffett, has argued that this number is still too high, and suggested 6.5% as a more realistic estimate (Buffett 2001). In these cases we are no longer talking about a "hard" minimum requirement, but rather a projection which relates more to market conditions than to the liability requirements of a fund. However, as Buffett pointed out, the legal repercussions of these stated assumptions are far from negligible, and therefore they might as well be regarded as requirements.

Based on these considerations, it is recommended that pension fund managers apply a minimum return requirement when selecting their investments (Sortino *et al.* 1999). The strength of the Omega measure in such a situation would be its ability to compare investments specifically with this minimum in mind. Below we calculate the Omega values to our sample of CTAs, setting the loss threshold to 3.25%, 6.5% and 8% annually (Tables 1-3). We will call the annual threshold R, noting that these values correspond to monthly thresholds r of 0.27%, 0.53% and 0.65%.

R = 3.25%	Fund	Omega	Sharpe	Sharpe rank
1	Beach Discr	2.48	1.17	1
2	AHL Diver	1.98	0.84	2
3	Rotella	1.89	0.73	4
4	Transtrend	1.82	0.73	5
5	Grossman	1.74	0.76	3
6	*Winton*	1.70	0.72	6
7	Aspect	1.64	0.66	7
8	Grinham	1.57	0.55	9
9	Campbell	1.53	0.56	8
10	Graham	1.49	0.51	10
11	BAREP	1.46	0.49	11
12	JWH	1.45	0.39	12
13	Beach Syst	1.34	0.38	13
	Correlation	0.975		
	Spearman	0.982		

Table 1. CTAs ranked by Omega for R=3.25%, with their corresponding Sharpe ratio rankings (for Risk Free=3.7%).

R = 6.5%	Fund	Omega	Sharpe	Sharpe rank
1	Beach Discr	2.13	1.17	1
2	AHL Diver	1.74	0.84	2
3	*Winton*	1.54	0.72	6
4	Rotella	1.54	0.73	4
5	Grossman	1.52	0.76	3
6	Aspect	1.45	0.66	7
7	Transtrend	1.41	0.73	5
8	JWH	1.33	0.39	12
9	Campbell	1.30	0.56	8
10	Graham	1.28	0.51	10
11	Grinham	1.24	0.55	9
12	BAREP	1.24	0.49	11
13	Beach Syst	1.17	0.38	13
	Correlation	0.951		
	Spearman	0.912		

Table 2. CTAs ranked by Omega for R=6.5%, with their corresponding Sharpe ratio rankings (for Risk Free=3.7%).

R = 8%	Fund	Omega	Sharpe	Sharpe rank
1	Beach Discr	1.99	1.17	1
2	AHL Diver	1.65	0.84	2
3	*Winton*	1.47	0.72	6
4	Grossman	1.43	0.76	3
5	Rotella	1.40	0.73	4
6	Aspect	1.37	0.66	7
7	JWH	1.28	0.39	12
8	Transtrend	1.26	0.73	5
9	Campbell	1.21	0.56	8
10	Graham	1.19	0.51	10
11	BAREP	1.15	0.49	11
12	Grinham	1.12	0.55	9
13	Beach Syst	1.10	0.38	13
	Correlation	0.919		
	Spearman	0.877		

Table 3. CTAs ranked by Omega for R=8%, with their corresponding Sharpe ratio rankings (for Risk Free=3.7%).

We note from the above that managers perform differently in the rankings depending on the threshold set. Predictably, Winton performs better for higher R values. In addition, we have compared the findings of the Omega calculations with those of the Sharpe ratio, and found considerable differences in the rankings.

Retail Funds

Another instance where business considerations force a minimum level of returns is the promotion of hedge funds or funds of funds. There are several levels of fees which such products are subject to, and all must be taken into consideration by the time they appear on the market place. Management and performance fees are subtracted at the level of the individual manager. In addition to this, however, a distributor will need to take account of the promotion costs, while a fund of funds will take their own management and performance fees. Both of these intermediaries will need to ensure that the performance of the base product is sufficient to surpass their own fee hurdles in order to guarantee their fees and provide their investors with satisfactory returns. Here we take the more simple case of hedge fund distribution.

The size of the cost “wrap” on funds will vary depending on the distributor, but we estimate that most fall within the 3%-6% range. We can therefore use Tables 1 and 2 to represent the extremes of this range. Again, we can see that depending on the fee burden, different managers would be more or less suitable for a distribution network.

A USEFUL SHORTCUT

The Omega statistic is gradually gaining acceptance among sophisticated hedge fund investors due to its superior ability to capture all aspects of a fund's return distribution. Some of the resistance to its universal adoption is due to the fact that its calculation is complex, and it does not relate in an intuitive way to the traditional return/risk measures. This may account for attempts to place it on a more "intuitive" footing (e.g. Kazemi et al. 2003).

We can suggest a simple shortcut, which preserves the focus on a minimum return threshold and takes account of some of the tail behaviour of return distributions while being closer to what most people would recognise as a return/risk measure. This is in fact the familiar Sortino ratio with relation to a return threshold. Excess return is defined as return above the specified threshold, and downside risk is defined as the Semi-Standard Deviation with respect to the threshold. This is in fact the ratio as Sortino himself intended it to be used, and for this reason we refer to it as the Real Sortino ratio; subsequent analytical developments are discussed on the website of the Pension Research Institute (http://www.sortino.com/), where the loss threshold is called the "minimum acceptable return" (MAR) and is championed as a crucial component of investment strategy.

$$\mathrm{Re}\,alSortino = \frac{\mu - MAR}{SemiStDev(MAR)}$$

Below we compare the results of our Omega calculations with those of the Real Sortino ratio using the same threshold (Tables 4-6). We can see a very close match, with rankings for the 6.5% threshold being identical.

R = 3.25%	Fund	Omega	Real Sortino	Real Sortino rank
1	Beach Discr	2.48	2.476	1
2	AHL Diver	1.98	1.849	2
3	Rotella	1.89	1.555	3
4	Transtrend	1.82	1.443	4
5	Grossman	1.74	1.376	6
6	*Winton*	1.70	1.285	7
7	Aspect	1.64	1.377	5
8	Grinham	1.57	1.092	8
9	Campbell	1.53	0.905	9
10	Graham	1.49	0.901	10
11	BAREP	1.46	0.839	11
12	JWH	1.45	0.820	12
13	Beach Syst	1.34	0.652	13
	Correlation	0.987		
	Spearman	0.987		

Table 4. CTAs ranked by Omega for R=3.25%, with their corresponding Real Sortino ratio rankings (for MAR=3.25%).

R = 6.5%	Fund	Omega	Real Sortino	Real Sortino rank
1	Beach Discr	2.13	1.958	1
2	AHL Diver	1.74	1.438	2
3	*Winton*	1.54	1.012	3
4	Rotella	1.54	0.994	4
5	Grossman	1.52	0.989	5
6	Aspect	1.45	0.987	6
7	Transtrend	1.41	0.758	7
8	JWH	1.33	0.610	8
9	Campbell	1.30	0.529	9
10	Graham	1.28	0.528	10
11	Grinham	1.24	0.484	11
12	BAREP	1.24	0.457	12
13	Beach Syst	1.17	0.337	13
	Correlation	0.992		
	Spearman	1		

Table 5. CTAs ranked by Omega for R=6.5%, with their corresponding Real Sortino ratio rankings (for MAR=6.5%).

R = 8%	Fund	Omega	Real Sortino	Real Sortino rank
1	Beach Discr	1.99	1.736	1
2	AHL Diver	1.65	1.261	2
3	*Winton*	1.47	0.892	3
4	Grossman	1.43	0.822	4
5	Rotella	1.40	0.760	6
6	Aspect	1.37	0.819	5
7	JWH	1.28	0.517	7
8	Transtrend	1.26	0.480	8
9	Campbell	1.21	0.367	10
10	Graham	1.19	0.369	9
11	BAREP	1.15	0.295	11
12	Grinham	1.12	0.237	12
13	Beach Syst	1.10	0.202	13
	Correlation	0.994		
	Spearman	0.991		

Table 6. CTAs ranked by Omega for R=8%, with their corresponding Real Sortino ratio rankings (for MAR=8%).

The difference in fit from the Sharpe ratio can be attributed to two factors. The first is the choice of a threshold rather than the automatic use of the risk-free rate. Secondly, by measuring the downside risk with respect to the same threshold, we are able to capture some of the effects of the skewness of the distribution in addition to the mean and variance. In general we can say that when the loss threshold is set close to the mean of the returns distribution we can expect a convergence between Omega and Real Sortino results; however, results will not always be identical, and the correspondence will vary between asset classes (see Favre-Bulle and Pache 2003). However, this method captures a great deal of the spirit of the more sensitive Omega statistic, and provides a fairly good first approximation.

Further information and research by Winton Capital Management can be found at http://www.WintonCapital.com/

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