FundCreator, Transaction Costs and the Rebalancing Frequency

FundCreator designs futures trading strategies that generate returns with predefined statistical properties. Depending on the targeted properties and the way markets behave, FundCreator strategies can be quite dynamic, so an obvious question to ask is whether the high turnover in FundCreator strategies isn't excessively costly. In this brief note we answer this question.

Transaction Costs

Conventional wisdom tells us that transaction costs are made up of two components: commissions plus half the bid-offer spread. Futures commissions tend to be extremely low, so these are unlikely to present any problems. The bid-offer spread is different. Spreads in liquid contracts, such as the nearby S&P 500 contract for example, tend to be extremely narrow; only a few basis points at most. Spreads in less liquid contracts, however, can be significant. In addition, under more extreme circumstances spreads will widen as market makers become less eager to provide low cost liquidity.

The above suggests that we might run up quite a bill when executing a FundCreator strategy. However, this skips over the fact that when executing a trade one does not necessarily have to trade on the prevailing bid or offer. One might well compete with the market makers, put in limit orders and try to buy on the bid and sell at the offer, instead of the other way around. Of course, when doing so it may take some time to get all trades executed. This is where the time-sensitivity of a trade comes in. When, for whatever reason, it is vitally important that a trade gets executed immediately, then there is little or no time to 'work' the trade. However, when this is not the case, there is a lot to be gained by taking some time for the execution. When done right, this might well force average transaction costs down towards zero.

To fathom the relevance of the above in a FundCreator context, in what follows we study the impact of different transaction cost levels and rebalancing frequencies on the bottom line results of three distinctly different FundCreator strategies over the period 1999 - 2006.

Set-Up

Since FundCreator strategies will typically be used to diversify a larger, more traditional portfolio, we take the reference portfolio to consist of 50% S&P 500 and

50% T-bond futures. In addition, we assume that the reserve asset consists of an equally-weighted portfolio of 3-month Eurodollar, 5-year note, 10-year note, S&P 500, Russell 2000 and GSCI futures, where, to compensate for the difference in volatility we leverage the Eurodollar and 5-year note by a factor 5, and the 10-year note by a factor 4. To obtain a good impression of how different transaction cost levels and rebalancing frequencies influence the bottom line, we study 3 different cases: (1) replication of the HFRI Equity Market Neutral index, (2) replication of the HFRI Long-Short index, and (3) creation of a Zero-Correlation Fund. Case (1) and (2) correspond to what we did earlier in Kat and Palaro (2006b), while case (3) comes from Kat and Palaro (2006a).

Results

Table 1 shows the sample properties of the replicated returns on the HFRI Equity Market Neutral index for various bid-offer spreads (0bps, 4bps, etc.) and rebalancing frequencies (daily, once every 2 days, and once every 3 days) over the period March 1999 – October 2006. Note that the case of a 50bps spread is included for illustrative purposes only. As discussed earlier, in practice one would not expect to trade on such a wide spread.

	Mean	**StDev**	**Skew**	**Corr**
HFRI EMN Index	6.26%	2.92%	0.60	-0.01
Synthetic 0bps, daily	6.79%	2.98%	0.22	-0.06
Synthetic 4bps, daily	6.75%	2.98%	0.20	-0.06
Synthetic 14bps, daily	6.65%	2.97%	0.19	-0.06
Synthetic 50bps, daily	6.30%	2.96%	0.11	-0.06
Synthetic 0bps, 2 daily	6.83%	3.00%	0.20	-0.07
Synthetic 4bps, 2 daily	6.81%	2.99%	0.19	-0.07
Synthetic 14bps, 2 daily	6.77%	2.99%	0.18	-0.07
Synthetic 50bps, 2 daily	6.60%	2.99%	0.16	-0.07
Synthetic 0bps, 3 daily	6.65%	2.98%	-0.01	-0.07
Synthetic 4bps, 3 daily	6.64%	2.98%	-0.01	-0.07
Synthetic 14bps, 3 daily	6.60%	2.98%	-0.02	-0.07
Synthetic 50bps, 3 daily	6.49%	2.97%	-0.04	-0.07

Table 1: Sample properties HFRI Equity Market Neutral index and synthetic fund returns over the period March 1999 - October 2006.

From the above table we can draw two interesting conclusions. First, the risk profile generated is largely independent of the level of transaction costs as well as the rebalancing frequency. Second, the impact of transaction costs on the mean is small and drops when rebalancing less often. Note that even with a 50bps spread the synthetic fund would still have beaten the index.

	Mean	StDev	Skew	Corr
HFRI L-S Index	11.48%	10.68%	0.88	0.57
Synthetic 0bps, daily	13.55%	11.26%	1.13	0.61
Synthetic 4bps, daily	13.48%	11.26%	1.13	0.61
Synthetic 14bps, daily	13.18%	11.25%	1.13	0.65
Synthetic 50bps, daily	12.14%	11.23%	1.13	0.61
Synthetic 0bps, 2 daily	13.10%	11.25%	1.15	0.61
Synthetic 4bps, 2 daily	13.04%	11.25%	1.15	0.61
Synthetic 14bps, 2 daily	12.86%	11.25%	1.15	0.61
Synthetic 50bps, 2 daily	12.34%	11.24%	1.15	0.61
Synthetic 0bps, 3 daily	12.78%	11.24%	1.14	0.61
Synthetic 4bps, 3 daily	12.73%	11.24%	1.14	0.61
Synthetic 14bps, 3 daily	12.65%	11.24%	1.14	0.61
Synthetic 50bps, 3 daily	12.29%	11.23%	1.15	0.61

Table 2: Sample properties HFRI Long-Short index and synthetic fund returns over the period March 1999 - October 2006.

Table 2 shows the sample properties of the replicated returns on the HFRI Long-Short index. Again, we see that the risk profile generated is independent of the level of transaction costs as well as the rebalancing frequency. The impact of transaction costs on the mean is slightly stronger than before, as the index being replicated is a lot more volatile. For realistic spreads, however, the results are still very satisfactory, with average costs again dropping with the rebalancing frequency. As in the previous case, the synthetic fund would have beaten the actual index even with a 50bps spread.

	Mean	StDev	Skew	Corr
Synthetic 0bps, daily	13.28%	11.50%	0.11	0.04
Synthetic 4bps, daily	13.13%	11.50%	0.11	0.04
Synthetic 14bps, daily	12.66%	11.49%	0.11	0.04
Synthetic 50bps, daily	11.05%	11.46%	0.10	0.04
Synthetic 0bps, 2 daily	13.83%	11.43%	0.08	0.03
Synthetic 4bps, 2 daily	13.75%	11.43%	0.08	0.03
Synthetic 14bps, 2 daily	13.52%	11.43%	0.07	0.03
Synthetic 50bps, 2 daily	12.71%	11.41%	0.07	0.03
Synthetic 0bps, 3 daily	12.84%	11.28%	0.07	0.04
Synthetic 4bps, 3 daily	12.77%	11.28%	0.07	0.04
Synthetic 14bps, 3 daily	12.63%	11.28%	0.07	0.04
Synthetic 50bps, 3 daily	12.11%	11.27%	0.07	0.04

Table 3: Sample properties Zero Correlation Fund returns over the period March 1999 - October 2006.

Finally, table 3 shows the sample properties of the returns on the Zero Correlation Fund. As before, there is no significant impact of transaction costs and/or the rebalancing frequency on the risk profile. Despite the similarity in volatility, the impact of transaction costs on the mean is slightly stronger than in table 2. This

reflects the fact that the target for correlation is substantially lower this time, which requires additional trading. For realistic cost levels, the results are still quite satisfactory, especially for lower rebalancing frequencies.

Conclusion

FundCreator strategies are very robust with respect to transaction costs and the rebalancing frequency. In practice, the low time sensitivity of trades means that transaction costs can be minimized in two ways: (1) by 'working' these trades, instead of simply trading on the prevailing bid and offer, and (2) by rebalancing less frequently. Doing so, one should of course be careful not to approach this too mechanically and always take the required trade size and the prevailing market conditions into account. Good execution is part art and part science.

References

Kat, H. and H. Palaro, Tell Me What You Want, What You Really, Really Want! An Exercise in Tailor-Made Synthetic Fund Creation, Alternative Investment Research Centre Working Paper 36, Cass Business School, 2006a.

Kat, H. and H. Palaro, Hedge Fund Indexation the FundCreator Way. Alternative Investment Research Centre Working Paper 38, Cass Business School, 2006b.