Pair Trading Stocks

By Ernest P. Chan, Ph.D. June 18, 2007

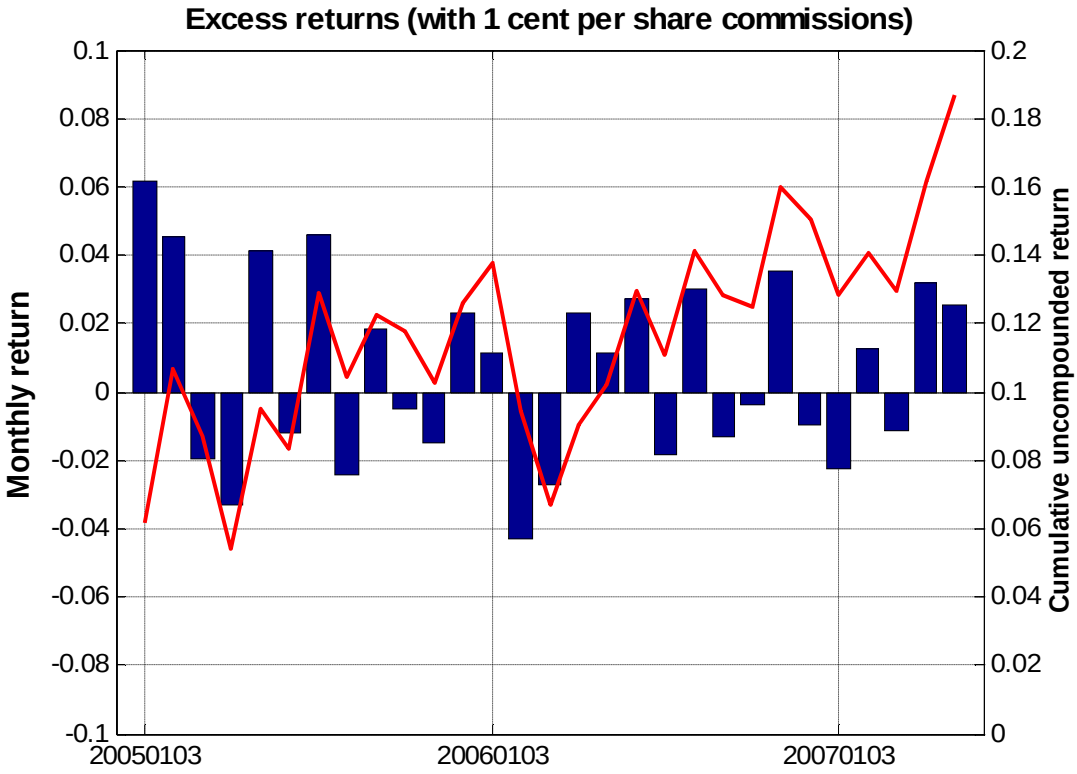
I have discussed in various articles trading the spreads between pairs of ETF's, or between a basket of stocks against an ETF using cointegration technique. However, I haven't yet discussed the classic statistical arbitrage strategy: pair-trading stocks.

There are pros and cons on applying cointegration to pair-trading stocks. On the pro side: because of the large number of stocks, we can enjoy a highly diversified portfolio that improves the validity of our results. Even if a number of spreads fail to cointegrate going forward, we can count on a larger number of spreads that still do. (For e.g. my USO-XLE spread fell apart, while GLD-GDX spread is still tightly cointegrated.) There are 2 main cons: 1) stocks are subject to various specific risks which may render our purely statistical model useless, especially in M&A situations. Therefore it is customary to remove such stocks from our portfolio when they are involved in special situations – however, by the time the news is public we may have incurred substantial loss already. 2) Because of the technique's long history, it became known to many hedge funds and indeed students of finance, and therefore pair trading stocks has not been very profitable, especially in the period 2003-2005. Interestingly, when a strategy becomes too popular and less profitable, many traders start to abandon it, or at least reduce their trading capital invested in the strategy. After a while, its popularity decreases, and the profitability recovers! This strategy recovery starts in 2005, and is still in full-force. Here I plotted the excess returns of the strategy as applied to US bank stocks from 20050103 to 20070531. (Excess returns means credit interest on margin balance is not included.)

The average annual excess return is about 7.7% (on one-side of capital), and the Sharpe ratio is 0.8. Since I have applied the technique on only one industry group, diversification is limited and therefore the Sharpe ratio is low. For the interested readers, they can attempt to apply this technique to more industry groups and perhaps generate a higher Sharpe ratio. Even with just one industry group, this trading strategy may be a good complement to a portfolio heavy on trend-following strategies and therefore require a reversal model to smooth out the returns.

I have started a model portfolio in my subscription area to demonstrate this strategy. It will be updated daily around 3pm ET. (When I initiated the portfolio on June 18, 2007, there were no positions.) I picked only those pairs of stocks that historically have at least a 90% cointegration probability and a mean reversion half-life of shorter than one month as candidates for trading. I enter into a pair when their spreads are ±2 standard deviations away from the mean and I exit those pairs when their spreads revert to ±1 standard deviations. Furthermore, parameters such as hedge ratios, standard deviations and cointegration probabilities are re-estimated on a monthly basis. So if we find that a pair is no longer cointegrating, its existing position will be liquidated. Currently, the portfolio is limited to US bank stocks, and it assumes $10,000 capital per symbol per side. Eventually, I hope to add more industry groups to the portfolio. I have also included the latest cumulative P&L of the model portfolio on the subscription page (scroll down to bottom of portfolio.)

(For readers who would like to purchase a copy of the Excel program I used to generate the daily trades to run on their desktop, please feel free to contact me.)



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