Swing Trade Cycle Analysis

In this paper we will study a simple swing trade strategy in detail. The objective will be to determine the key characteristics of a "typical" swing trade: profitability, risk, duration.

The strategy we will test is a long-only mean-reversion system that looks to enter a position after a sustained period of selling. The concept here - like for most mean-reverting strategies – is that an instrument that is short-term oversold is more likely to bounce than to continue its downward move, at least in the near future.

Strategy Rules

To trigger an entry the security must:

- Have closed below its 10 day moving average for at least 10 days in a row;
- Have just incurred its lowest low;
- Be in a long-term uptrend (above its 200 day moving average);

To trigger an exit the security must:

- Close above its 10 day moving average

In order to generate a sizable sample size we will apply this strategy from July 1995 to Aug 2014 to all the components of the S&P500 (as of Jan 1st 2014). Trade size is $100,000. For the sake of simplicity, we will assume perfect entries, and disregard both commissions and slippage.

It should be noted that this strategy coupled with the rules described above would not be "tradable" as-is in real life. This is because signals from the 500 securities that make up our S&P500 universe tend to come in clusters of 5, 10 and sometimes more signals on any day, depending on market action. It would therefore be impossible to trade all signals all the time with the full $100,000. Results are therefore presented for academic purposes only.

Trade Examples

Below are two charts, one showing a typical winning trade, the other a typical losing trade.

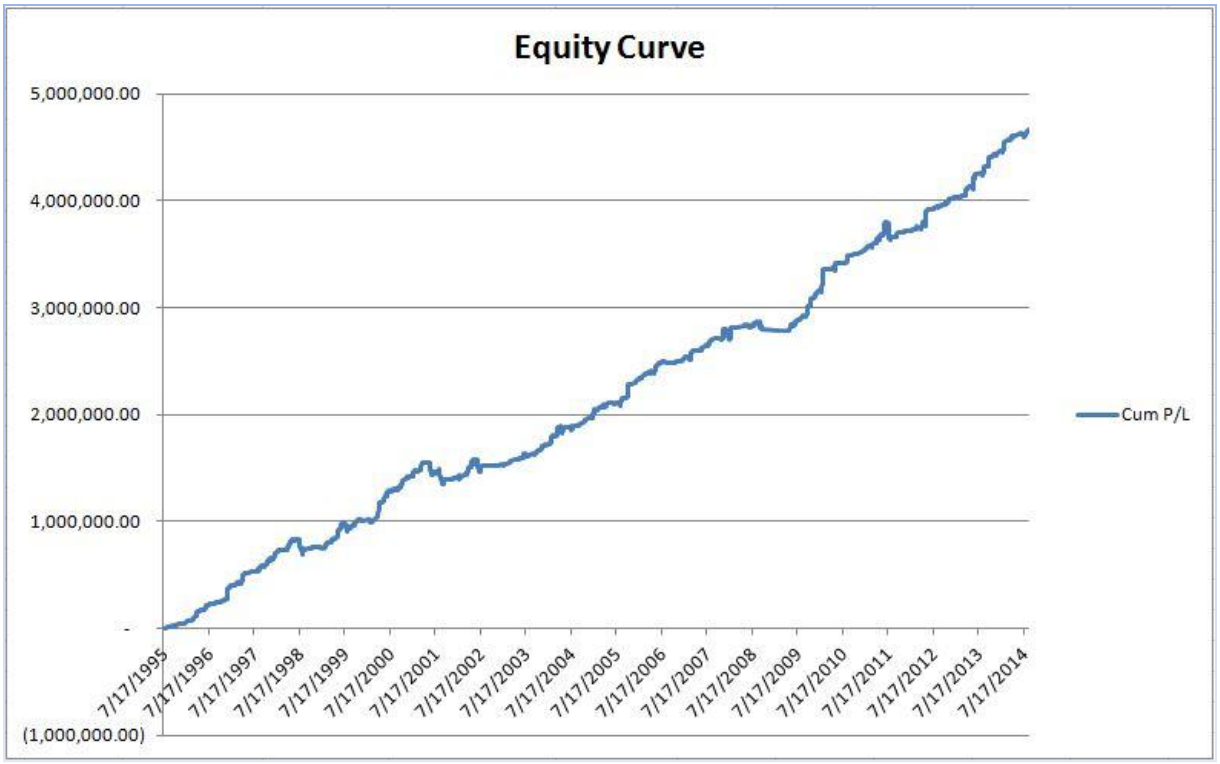
Chart 1

Chart 2

In both charts we see that just prior to entry the instrument had undergone a sustained period of selling. In Chart 1, price recovers quickly and in only 4 days it closes back up above its 10 day moving average for a winning trade. In Chart 2, the selling continues well after entry point. Price continues to slide and it takes 13 days for the stock to finally bounce and close above its 10 day moving average for a losing trade.

Results

Total # Trades:	3165	**# Winners:**	2414	**# Losers:**	751
Win Rate:	76%	**Average Win Size:**	3.3%	**Average Loss Size:**	-4.5%
Profit Factor:	2.38	**Duration Avg Win:**	5.5 days	**Duration Avg Loss:**	18 days

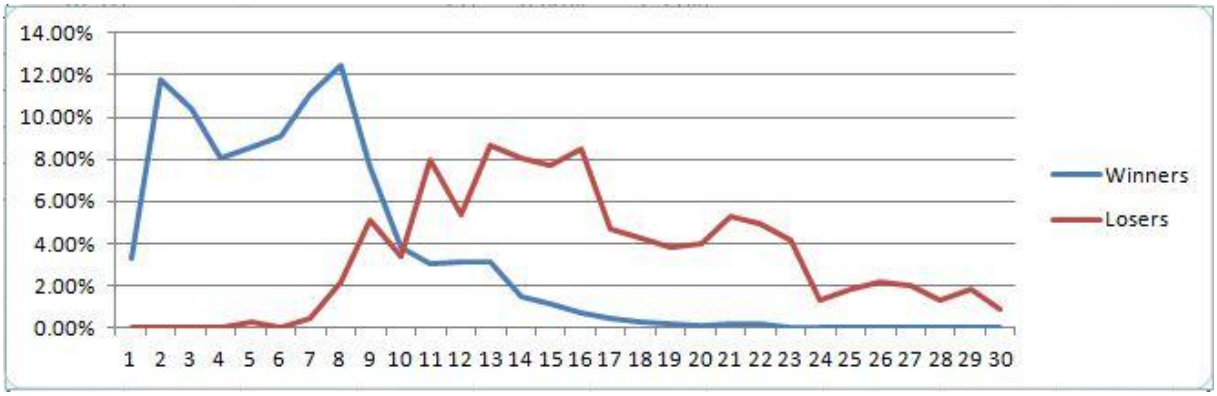


The strategy's results are rather good, particularly considering the large trade count of 3165 instances. The 76% win rate, coupled with a 3.3% average win vs -4.5% average loss, result in an overall profit factor of 2.38.

The equity curve is fairly straight and consistent over time. Drawdowns were experienced from 2001 to 2003 and again from 2008 to 2009, mirroring major market downturns. So, as we would expect, this long-only system performed better during bull markets than bear markets.

Average Trade Duration

Mean-reversion strategies that employ moving average exits all have one thing in common: winners tend to be fast and furious, while losers tend to be slow and painful. This is because a rising price will quickly find its moving average, while a falling price can take a very long time to eventually reconnect with its moving average. This explains why, for the above system, the average trade duration of a winning trade is only 5.5 days, compared to 18 days for a losing trade. The chart below shows win & loss durations for this strategy:



Edge Duration

An issue that most traders face when using this type of mean-reverting swing strategy is deciding if and when to forcibly exit a losing trade. A novice trader will be tempted to exit a trade, even at a substantial loss, *as soon* as a trade starts going against him. However, mean-reversion systems, as depicted here, expect the trader to stick to the strategy rules and exit at mean-reversion, regardless of how long that takes.

Still, it can be argued that any trading edge, however strong, will taper over time. And since there is an opportunity cost of locking capital in a losing trade, it would be interesting to determine whether it does make sense to exit a losing trade *before* mean reversion and if so, when. The table below shows the results of the exact same strategy using an X day forced exit:

Exit After	Win Rate	Profit Factor	Average Win %	Average Loss %	Average Trade %	% of Losing Trades Left
2 days	60%	1.72	2.53%	-2.25%	0.63%	100%
7 days	64%	1.92	3.37%	-3.16%	1.03%	99.72%
14 days	75%	2.20	3.38%	-4.51%	1.36%	66.62%
17 days	76%	2.17	3.33%	-4.76%	1.35%	42.33%
21 days	76%	2.34	3.33%	-4.57%	1.44%	25.57%
28 days	76%	2.39	3.34%	-4.49%	1.47%	3.98%
35 days	76%	2.39	3.34%	-4.50%	1.46%	<2%
Mean Reversion	76%	2.38	3.33%	-4.50%	1.46%	0

With a 7 day exit the system's win rate hits 64% and the profit factor (PF) reaches 1.92. At 14 days, the numbers keep improving and reach 75% and 2.20. At 21 days, the win rate peaks at 76% and the PF reaches 2.34, with 25% of losing trades still open. Beyond there, the win rate does not improve, and the PF does so only marginally. The "sweet spot" therefore seems to be at the 3-4 week mark. At this stage the edge that warranted the original trades has essentially disappeared, and there is no more profit expectancy to squeeze out of open positions. So this is the time a trader can consider licking his wounds and closing off all losing trades without regret.

Summary

The results above suggest that mean-reversion is indeed alive and well in the US stock market. The simple system we analysed had strong results throughout 1995 to 2014, albeit with drawdown periods during sustained market reversals, such as the bear years of 2001-2002 and 2008-2009.

We saw that this type of strategy can offer a very good win rate. However, average winners are smaller than average losers, and the average duration of losing trades is considerably longer than that of winning trades. This will tempt traders to exit losing positions early, which has a negative impact for this type of system.

On the other hand, given the opportunity and margin costs of holding on to a losing trade, it may be of great value for traders to identify the tipping point beyond which holding on to a losing position no longer improves profit expectancy.