The Mechanical Trader

Golden Cross vs. Death Cross

Introduction

The “Golden Cross” is a well-documented signal involving the cross-over of a security's “fast” moving average above it’s “slow” moving average. This pattern essentially indicates that the security's more recent average price has risen *above* its longer-term average price, suggesting that a bullish trend is now in place. Analysts generally view the Golden Cross as a good omen, particularly when it occurs in a stock market index, such as the S&P500, the Dow or the Nasdaq100.

The "Death Cross", as the name suggests, is generally interpreted as a bearish signal and occurs when a security's slow moving average crosses *below* its slow moving average. For this to occur, recent average prices have to have fallen below longer-term average prices, indicating that a bearish trend may now be in place.

In this study we will look at whether the Golden Cross and Death Cross indicators are reliable entry/exit tools for the longer-term investor. For the sake of simplicity we will base our analysis on the more commonly used 50/200 fast/slow moving average pair.

Analysis

Below we examine the Golden Cross and Death Cross signals as applied to both the S&P500 index (INX) and the Dow Industrial Average Index (INDU), from Jan 1st 1966 to Dec 31st 2015 (50 years). In the test strategy below a Golden Cross signal will trigger a long entry while a Death Cross will trigger a short entry.

System data:

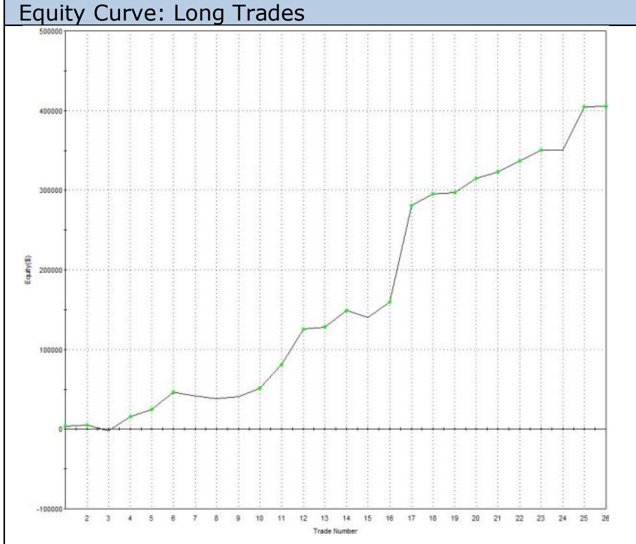
- Instruments: INX (S&P500 Index) or INDU (Dow), from Jan 1st 1966 to Dec 31st 2015
- Capital per trade: US$ 100,000 (no compounding)
- No allowance for commissions or slippage

System rules:

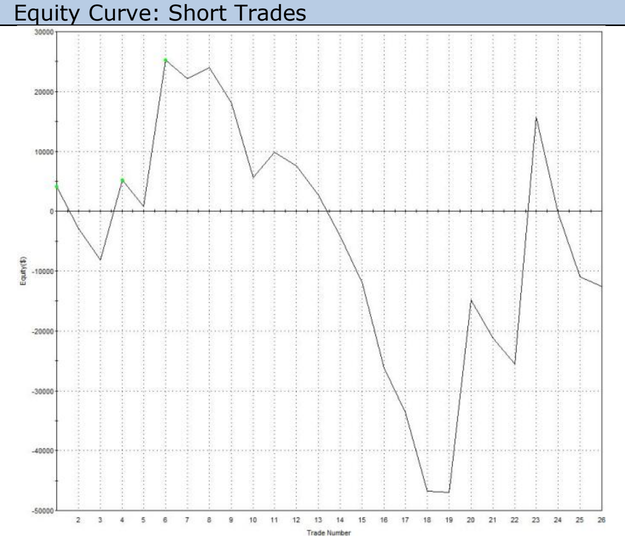
- Long when the 50 day moving average crosses above the 200 day moving average
- Short when the 50 day moving average crosses below the 200 day moving average

Index: S&P500 From: Jan 1st 1966 To: Dec 31st 2015	All Trades	Long Trades	Short Trades
Net Profit	$388,953	$402,690	- $13,736
Profit Factor	3.47	17.87	0.90
Total Trades	52	26	26
Win Rate	53.85%	80.77%	26.92%

Equity Curve: Long Trades



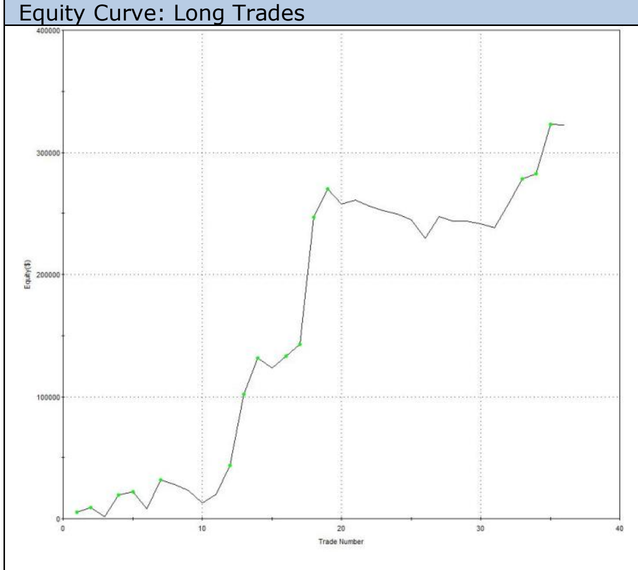
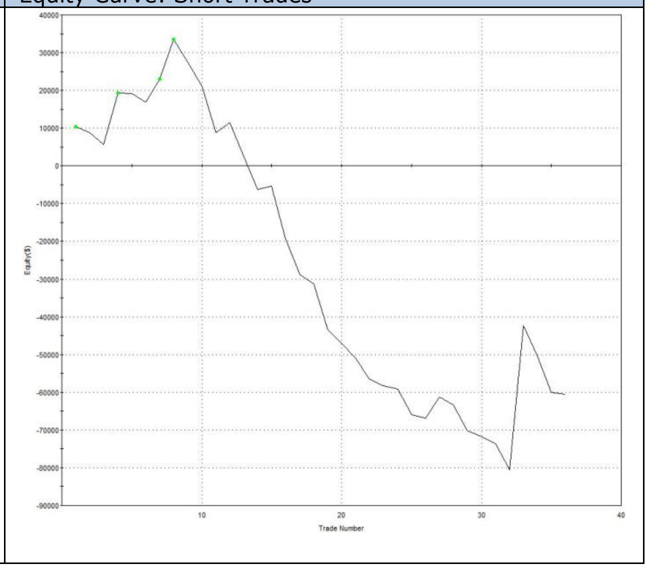
Equity Curve: Short Trades



The table and charts above show the hypothetical results of our system when applied to the S&P500 Index. As we can see, the combined long/short strategy ("all trades" in the table) would have been profitable for the 50 years of the study. However, when we split the trades triggered by Golden Cross signals (long trades) from those triggered by Death Cross signals (short trades) we notice a huge difference in their respective performance statistics. Long trades would have been profitable 80% of the time and would have generated 3.5 times more profits than losses. Short trades, on the other hand, would have been profitable only 27% of the time and would have lost $100 for every $90 gained.

Below we apply the same system to the Dow, again over the past 50 years.

Index: Dow From: Jan 1st 1966 To: Dec 31st 2015	All Trades	Long Trades	Short Trades
Net Profit	$261,722	$322,357	- $60,634
Profit Factor	2.05	4.18	0.59
Total Trades	72	36	36
Win Rate	37.50%	52.78%	22.22%

Equity Curve: Long Trades	Equity Curve: Short Trades
	

Results for the Dow are very similar to those for the S&P500. Here too, the long trades triggered by a Golden Cross would have made money over the period in question, while the short trades triggered by a Death Cross would have lost money. And the difference between the performance of the long and short systems is even more stark for the Dow than it is for the S&P500.

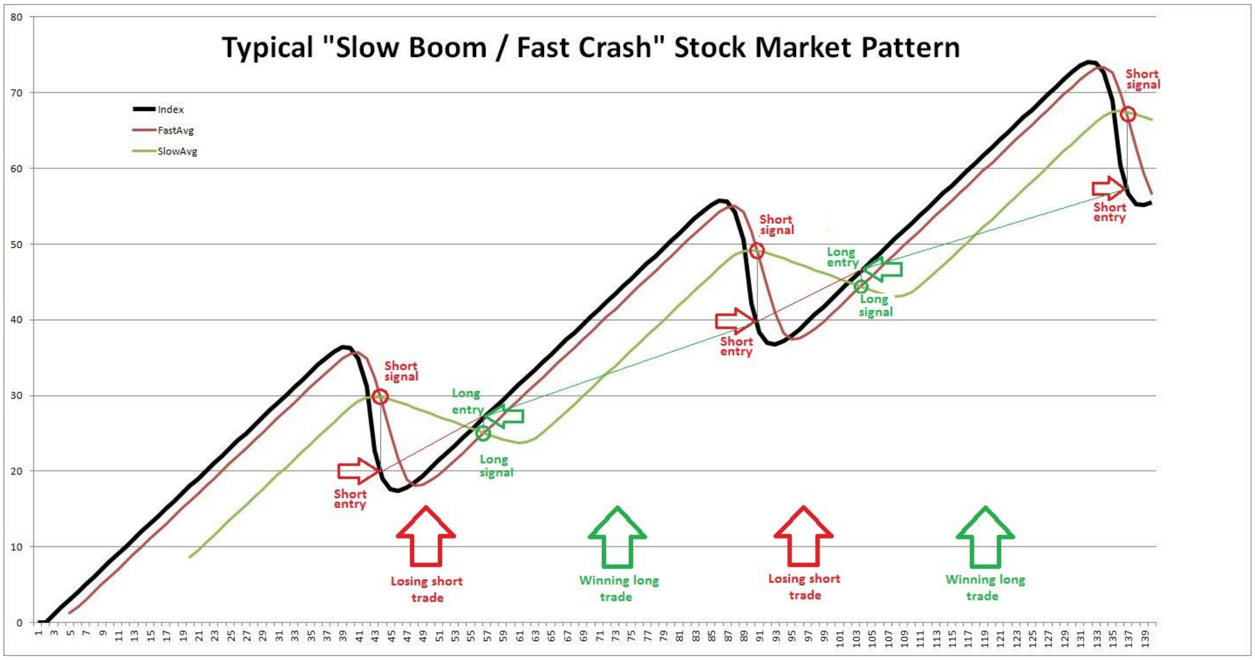
The above results indicate that a Golden Cross has, on the whole, been a reliable signal to go long the market. Indeed, positive 50/200 day moving average crossovers have often been followed by extended multi-month bull-runs. And using the Death Cross as an exit (flat) signal has done a fair job at capturing a good portion of total unrealized profits.

Using the Death Cross as a *short* signal and the Golden Cross as an exit (flat) signal, on the other hand, would have proven decidedly unprofitable over the long term. There are likely two main reasons for this:

The first is that stock market prices are inflationary by nature. They tend to rise over time, albeit in a non-linear, choppy manner. The S&P500 closed at 92 on Jan 3rd 1966 and closed at 2044 on Dec 31st 2015, equating to a compound annual growth rate of 6.40%. This strong positive directional bias makes speculating on the long side inevitably more profitable than betting on the short side, at least over the long-term. This also explains why the bulk of profitable quantitative trading systems focus on the long-side.

The second reason why Golden Cross longs tend to be more successful than Death Cross shorts is that "*markets take the stairs up and the elevator down*". This means that the short entries triggered by a Death Cross signal often occur only after the market has undergone a fast and sharp correction, and is thus already trading far from its recent highs. This serves to lower the statistical likelihood of further price erosion. Moreover, the stock market's tendency toward mean-reversion implies that prices are even more likely to be pushed back up into less oversold territory.

The chart below depicts a typical *Slow Boom / Fast Crash* market pattern, consisting of long periods of rising prices punctuated by the occasional sharp drop. This pattern allows trend-following systems using moving average pairs to do an adequate job at generating long entries fairly near recent market bottoms. Short entries, however, tend to trigger only after the market has already suffered considerable losses.



Summary

The key findings are:

- Golden Cross signals have been fairly good at identifying sustained long-term changes in market direction, from bearish to bullish. Moreover, since prices tend to rise fairly slowly, Golden Cross signals typically trigger fairly close to recent market bottoms thus allowing for reasonably favourable long entries.
- Death Cross signals have historically done a poor job at identifying good short entries. This is because the recurring *Slow Boom / Fast Crash* market pattern tends to trigger Death Cross signals at prices well below market highs, often leaving little in the way of further south-side expectancy. Moreover, mean reversion forces, coupled with the stock market's natural long-term inflationary nature, makes short-selling using the Death Cross signal particularly challenging.
- While the Death Cross is not the ideal signal to trigger a short trade, it is arguably an adequate signal to trigger *an exit from an existing long position*. Indeed, while the majority of mini-crashes tend to bounce back up fairly quickly, a minority of them don't. And the latter have at times turned into long multi-year market declines, such as those witnessed during 2000-2003 and 2008-2009. Indeed, while not all Death Crosses have been followed by long-term market declines, *all* long-term market declines have been *preceded* by a Death Cross. So a Death Cross formation in a major index may not indicate a good time to get short, but may well indicate a good time to get flat, this in order to sidestep the increasingly frequent multi-month/year bearish periods witnessed over the past 2 decades.