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Application of Simple Technical Trading Rules to Swiss Stock Prices: Is it Profitable?

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Abstract:
This paper tests if the use of simple technical trading rules on Swiss stock prices is profitable. It considers several trading rules based on the crossing of moving averages. The use of bands and oscillators such as the relative strength index or the stochastic indicator is also investigated. These rules are tested on daily returns of the Swiss Bank Corporation General Index for the period 1969-1997. It is found that the most profitable rule is a double moving average with averages computed on one and five days. With this rule, an annual average return on the SBC Index of 24.30% is obtained compared to a buy-and-hold annual return of 6.25%. These results are confirmed by bootstrap simulations which consider different return generating processes as the AR(1) model and the GARCH(1,1) model. Similar results are obtained for individual stocks. In the presence of trading costs, these rules are only profitable for a particular kind of investor.

Executive Summary:

Technical analysis is a generic term which includes many different techniques whose goal is to predict the future evolution of asset prices from the observation of past prices. There are two approaches to technical analysis. The first is purely graphical as it looks for patterns in past data.
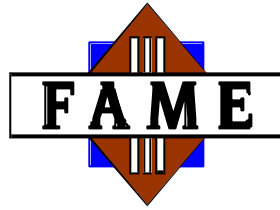
The second approach derives some trading rules on the basis of filters applied to past data. These

techniques were introduced a long time before modern financial theory was born and have therefore no theoretical foundation. This is one of the reasons why academics have looked at these techniques with contempt. Several other facts have contributed to this situation. The main reason is that technical analysis violates one of the basic principles of financial theory: the efficient market hypothesis, which claims that it is impossible to predict future prices from the observation of past prices. Another reason is that a major part of these techniques cannot be tested as they are purely graphical and they do not have precise rules. Finally, early tests of technical trading rules have produced very poor results which reinforced the general feeling of academics towards technical analysis. However, practitioners are still using these techniques to make investment decisions often in conjunction with more traditional tools as fundamental analysis as has been shown in a survey conducted by Taylor and Allen (1992). Recently, some academics have slightly changed their mind towards technical analysis as they found that it is possible to predict future returns with some simple technical trading rules.

Early attempts in academia to assess the effectiveness of technical analysis considered very simple rules called filter rules. These rules involve buying a security if it had risen by x% on the last period or selling it if its price has decreased by x% on the last period. Tests of these rules by Alexander (1964) and Fama and Blume (1966) showed that they do not yield very profitable results. These techniques remain however very simplistic, more elaborate rules are provided by technical analysis. This is why the more recent literature on technical analysis has considered one of the main tools of technical analysis: moving averages. The idea is that financial prices are volatile but that they follow some trend. Moving averages are supposed to capture trends and leave aside the "noisy" part of the evolution of prices. According to this rule, buy or sell signals are generated by two moving averages of the level of the index: a long period moving average and a short period moving average. The strategy involves buying (being long in) the asset when the short average is above the long moving average and selling (being short in) the asset when the short period moving average is below the long period moving average.

This research is in line with the recent literature on technical trading rules as it tests if these rules are profitable when they are applied to Swiss stock prices. We apply moving average rules to daily prices of the Swiss Bank Corporation General Index over the period 1969-1997. The results show that a simple buy-and-hold strategy on the SBC index produces a daily average return of 0.025% or 6.25% yearly over that period. The use of technical trading rules produces a daily average return of 0.097% or 24.30 % annually, which is significantly different and above the buy-and- hold average return. These results are obtained with simple moving averages with a short window of one day and a long period moving average of five days.

This research also investigates additional tools provided by technical analysis. It first considers
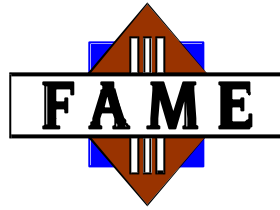
the use of a band around the long moving average. The idea behind the use of bands is to avoid "noisy" signals or in other words to be sure that a trend is really initiated. The principle is the

following : when the distance between the short moving average and the long moving average is less than a certain fraction of the long moving average (usually 1 or 5%), it is considered that the relative positions of moving averages cannot give reliable indications regarding the existence of a trend in stock prices. If such a situation happens the individual should not invest in the market and should hold the risk-free asset. With a 1% band we find that this type of rule is able to identify more accurately upwards and downward trending periods. However the number of days when this rule indicates neutral positions, i.e. to be out of the market and invest in the risk-free asset, is relatively large and does not allow to have a higher returns than with moving averages without bands. We also consider the use of oscillators with moving average rules. The oscillators are tools which are supposed to give an indication of when the trend in prices reverses and should indicate when to go out of the market. We consider two popular oscillators in this paper: the relative strength index and the stochastic indicator. The results show that the use of such tools is not of great help to improve performance. The best strategy seems therefore to be the one based on moving averages alone.

The predictability of asset returns could be due to some well-known features of the data as non-normality, serial correlation and time-varying moments. In order to check if these features do not bias the test statistics we conduct some bootstrap tests which assume that returns follow an AR(1) and a GARCH(1,1) processes. The results show that these features are present in our data set but they are not the cause of the profitability of technical trading rules.

Finally, we consider if these results still hold for individual stocks and in the presence of transaction costs. The results for individual stocks are similar to those found for the SBC index.

When we consider transaction costs, we find that small investors cannot benefit from the profits generated by the trading rules which means that the weak form efficient market hypothesis cannot be rejected for a large fraction of the market. Only some large investors fulfilling certain conditions (low transaction costs or more precisely not higher than 0.3-0.7% per transaction) could possibly get some profit from these techniques.

Despite the fact that the market efficiency cannot be rejected, one important question remains: Why do so simple rules lead to such profits in absence of transaction costs? The answer to this question could probably help us to have a better understanding of the dynamics of financial markets.