

On Trend-Following: Testing for Momentum Effects in Asset Returns

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Introduction

Trend-following strategies are also called momentum strategies. There are mainly two types of momentum strategies: time-series momentum and cross-sectional momentum. Time-series momentum refers to the phenomenon that the current performance of a given asset often exhibits positive correlation with its future performance, while cross-sectional momentum refers to the phenomenon that the outperformance of a give asset or basket of assets when compared against a group of other assets are often positively correlated with its future outperformance against the same group of assets.

Testing for Momentum Effects in Asset Returns

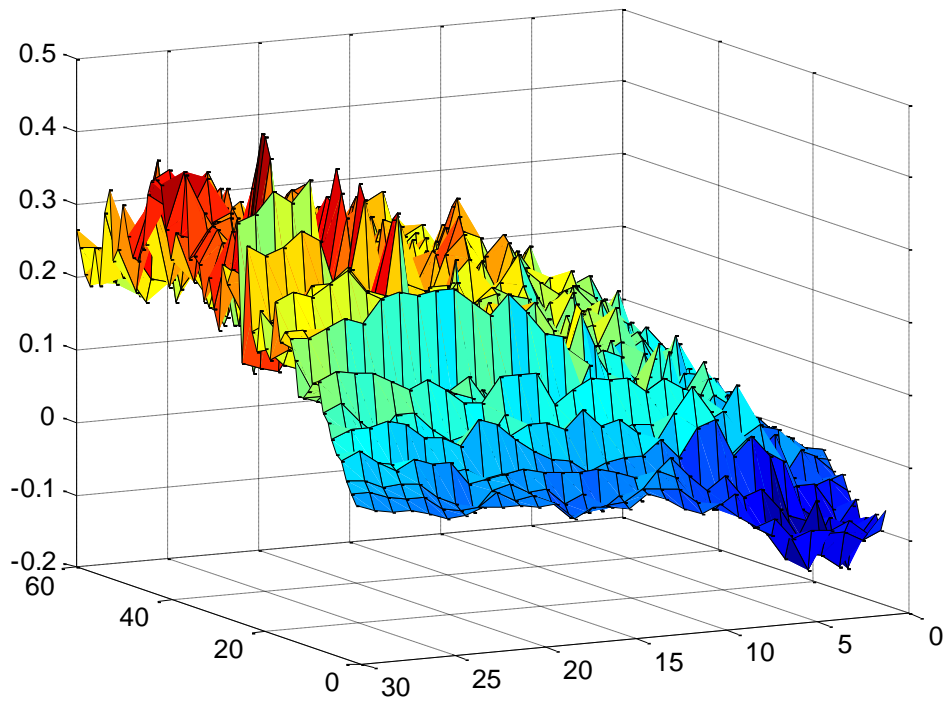
We claim the hypothesis that the past returns is autocorrelated with the future returns, where the lookback and holding periods are parameters to be determined.

The goal of this section is to find the optimal pair of observation period of past returns and the holding period such that the highest autocorrelation is achieved. If such autocorrelation is strong with small p-value, then it can become a candidate for momentum strategy. To maximize the usage of the sample data and power of the test, we use non-overlapping periods in each lookback and holding periods set.

In this section, the two-year Treasury note futures traded on CME is used for testing. The coverage of the data is from 2004 to 2012. We fix the lookback period to be ranged from 5 to 60 days with a 5-day increment, and fix the look forward period to be ranged from 5 to 30 days with a 5-day increment. The correlation between each past return and forward return combination is plotted in the following mesh grid:

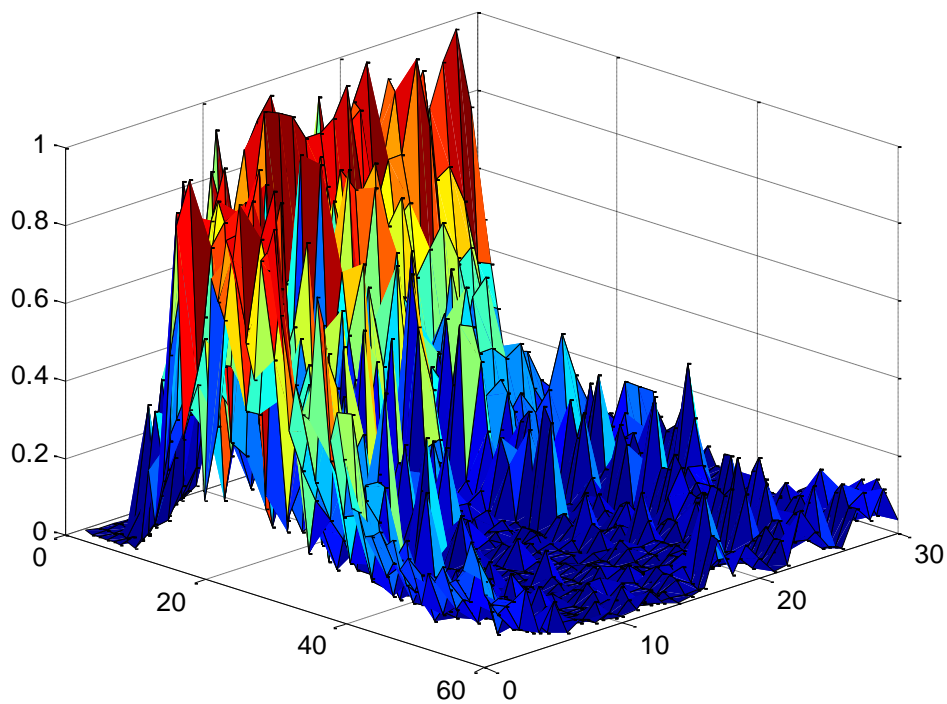
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Correlations between Past returns and forward returns



The p-value of correlation for the same lookback and look forward combination is plotted below:

P-value of Correlations between Past returns and forward returns



Therefore, it is observed that the best momentum strategy may be constructed by using a relatively large lookback period and holding period, as it provides the strongest correlation with the smallest p-values.

However, from a practical perspective, given the Bull Run observed during this period, the autocorrelation among those longer-term returns may be largely due to the positive drift. Indeed, these strong autocorrelations disappear during 2012 to 2015, and most autocorrelation pairs turned negative. From a trading perspective, we prefer short holding periods as they tend to be more stable over time.