CUATS coding competition: low volatility and momentum effects

Summary strategy

Team name: Coders love cookies

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The strategy is based on low volatility factor effects in stocks [1,2]. The performance of a basic low volatility strategy is enhanced by combining it with a momentum filter [3]. In literature it is reported that momentum strategies give higher returns when used on mid-cap stocks [4], therefore stocks are selected based on market capitalisation. The drawdown of the strategy is improved by investing in US Treasuries during bear markets. A back test of the strategy over 01/01/2007 – 01/01/2014 and has resulted in a Sharpe ratio of 1.2 and maximum drawdown of 9.7% and CAGR of 10.0%.

The investment universe consists of U.S. stocks and U.S. Treasuries. The stocks with a medium market capitalisation are selected. Of these stocks, the high-momentum are selected based on 12 month returns minus 1 month return, similar to ref. [3]. Stocks are included if the momentum is higher than average. Subsequently, a long only low volatility strategy is applied. Research has shown that low volatility stocks earn higher risk-adjusted returns than high volatility stocks, because investors tend to overpay for high volatile stocks [2,3]. In this strategy the volatility of stocks are ranked based on the volatility in the weekly return over the past year. The investment decision is to go long on the quartile with the lowest volatility. These stocks have lower risks without lower returns. The performance during bear markets is improved by liquidating the position on stocks which price has dropped more than 10% and investing in U.S. Treasuries instead. When the stock price has recovered, the stocks are considered again for investment. This adjustment resulted in less than 15% drawdown during bear markets including the crisis in 2008-2009 and in 2020. The strategy is back tested over periods from 1998 to 2023. Back tests before 1998 were not performed due to limiting data availability.

The combination of the momentum filter and the investment in U.S. Treasuries has made significant improvements to the original strategy published on Quantpedia [1]. The results on Quantpedia for the period 2000-2023 give a Sharpe ratio of 0.7 and a maximum drawdown of 45.4% [1]. For the improved strategy the Sharpe ratio for this time period is above 1 and the drawdown less than 15%.

**Sources:**

[1] Quantpedia. *Low volatility factor effect in stocks.* Online, last accessed: 28-01-2022. <https://quantpedia.com/strategies/low-volatility-factor-effect-in-stocks/>

[2] Blitz, D; Van Vliet, P. *The volatility effect: lower risk without lower return.* Journal of Portfolio Management, 2007, 102-113. <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=980865>

[3] Joshipura, M; Joshipura, N. *Low risk effect: evidence, explanations and approaches to enhancing the performance of low-risk investment strategies.* Investment Management and Financial Innovations, 2020, 128-145. <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3613658>

[4] Schmidt, P.S; Von Arx, U. et al. *Size and momentum profitability in international stock markets.* Swiss Finance Institute Research Paper, 2017, 15-29. <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2642185>