

Maximum Daily Returns and Cross-section of Asset Pricing in Chinese Markets

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Abstract: This paper empirically explores the relationship between stock maximum daily returns over the past month and its subsequent returns in the next month. Exploiting Chinese stock market data over the last ten years, in each month we sort our stock pools into ten portfolios based on the maximum daily returns, and we then formulate a trading strategy that longs the portfolio with the highest extreme returns and shorts the portfolio with the lowest extreme returns. We demonstrate that our investment strategy could generate significantly positive returns, and our results are robust after changing time horizons of the indicator. Overall, our paper suggests a negative relationship between stock maximum daily returns in the last month and subsequent returns in the next month, which is a strong proof for the quantitative behavioral theory that investors prefer assets with lottery-like payoffs and positively skewed distributions.

1. Introduction

Research on stock returns and asset pricing based on multi-factor models has been a hot spot in the financial academia. Many scholars have built multi-factor models based on corporation fundamentals to conduct empirical tests and have obtained fruitful results. However, frequent market changes also indicate that the assumptions of traditional efficient market theory and rational investors hypothesis are often inconsistent with reality. The capital pricing model under behavioral finance theory is obviously closer to social reality, and for some anomalies in the market, the asset pricing model under the behavioral finance theory framework is obviously more reasonable. Baker and Wurgler (2006) [1] pointed out that when the beginning-of-period proxies for investors sentiment are low, small stocks, high volatility stocks, unprofitable stocks and non-dividends-paying stocks, extreme-growth stocks and distressed stocks will have relatively higher subsequent returns. The price of stocks in the same category will be underestimated. On the other hand, the patterns largely reverse when sentiment is high. Merton (1973) [2] suggested that based on the assumption that investors maximize the expected utility of lifetime consumption and can trade continuously in time, the equilibrium relationship among the expected returns obtained by aggregating the demand is contrary to the classic capital asset pricing model, expected returns on risky assets may differ from the riskless rate even when they have no systematic or market risk. Kandel and Stambaugh (1996) [3] also showed that even weak evidence of return predictability can substantially influence an investor's portfolio choices. Therefore, more researchers focus on adding behavioral finance theory to asset pricing models, mining new factors based on behaviour and emotion, and exploring the impact of investor sentiment on stock returns.

For a long time, in the real financial market, individual investors who are non-professionals will be affected by investor sentiment and come to the consensus that the best time to buy stocks is when individual investors are bearish and the best time to sell when individual investors are bullish. At the same time, existing evidence shows that investors prefer assets with returns like lottery tickets, and many investors have poor diversification. In empirical research, scholars have added investor sentiment as an indicator to capital market pricing models. Neal and Wheatley (1998) [4], and Bali (2011) [5] investigate the significance of extreme positive returns in the cross-sectional asset pricing, portfolio-level analyses and firm-level cross-sectional regressions indicate a negative and significant relation between the maximum daily return over the past one month and expected stock

returns. Campbell and Kyle (1993) [6] showed that individual investors traded on noise can affect prices, their model implies that the price is elastically pulled back to fundamental value at a rate depending on the gap between price and value. That means expected returns are high when price is below fundamental value, and low when price is above value.

This paper innovatively integrates traditional and behavioral finance and studies the influence of market factors including sentiment and corporate fundamentals on stock returns. The maximum daily return of stocks in the past month is used as a sentiment indicator to construct a long-short hedging portfolio. A cross-sectional analysis of the portfolio's return in the next month is conducted to empirically test the relationship between future returns and extreme sentiment indicators. The results indicate that future multifactor models should not only consider the impact of market and fundamental factors, but also take investor sentiment into account, providing new ideas for multi-factor stock selection decisions in the A-share market. The results in our paper correspond to those of Barberis and Huang (2008) [7] that lottery-like stocks are preferable among investors and often follow low expected returns. We also help explaining the negative relationship between idiosyncratic volatility and expected returns, indicated by Ang, Hodrick, Xing and Zhang (2006) [8]. Lottery-like stocks usually have positively skewed historical distributions and thus their prices are generally more volatile.

2. Data

The dataset that we exploited in this paper includes all stock prices from Shenzhen Stock Exchange Main Board over the past 5 years. Since we need the highest single day return of the stock in the past month to construct our sentiment indicator, we extract stock prices on a daily frequency. In each month, we sort all stocks based on their extreme daily returns into ten portfolios. Portfolio one (ten) contains stocks with the lowest (highest) extreme daily returns. We could thus build a long-short trading strategy by longing portfolio one and shorting portfolio ten. In the next section, we conduct a cross-sectional analysis of the return of each portfolio in the next month and empirically test the relationship between maximum daily returns and subsequent performance.

3. Empirical Results

In the empirical test, all the stocks on the main board of the Shenzhen Stock Exchange are classified and calculated according to the maximum return rate of the previous month, and their average weighted monthly return is constructed to construct a long-short investment portfolio. Portfolio 1 (low MAX) is the portfolio of stocks with the lowest maximum daily returns during the past month, and portfolio 10 (high MAX) is the portfolio of stocks with the highest maximum daily returns during the previous month and so on.

From the Figure 1 we would observe that, buying assets with low historical yields and selling asset portfolios with high historical yields can bring positive returns, but as Max increases, the pattern is not one of a uniform decline as MAX increases. By buying portfolio4 and selling portfolio1 both showed negative yields. Given a preference for upside potential, investors may be willing to pay more for, and accept lower expected returns on, assets with these extremely high positive returns. This may be because of the preference for upward yields. Investors may be willing to pay higher prices for assets with extremely high positive returns. Accept lower expected returns. However, looking at the overall trend, building a long-short investment portfolio with the historical rate of return used as a sentiment indicator can bring significant excess returns, with the 0-9 portfolio having the highest excess return.

As synonymous with extremely high positive returns, the maximum single-day return is simple and intuitive, but at the same time it is a little arbitrary. To further confirm whether the investment portfolio constructed by the extreme return rate can really generate excess returns, we change the sentiment index measurement method and select the Nth (N=1,2,3,4,5) historical return one month ago. The rate is used as an indicator to construct the portfolio again. As before, we report the difference between the highest and lowest corporate yields in the previous month's daily historical

yield. Based on the results reported in Figure 2, it is easy to select N high yields. The return pattern of the rate of return is like the pattern when sorting the single largest daily return, which further verifies the importance of extreme returns, a portfolio constructed based on the extreme value of return can generate excess returns.

Another measure of return which shows the nature of lotteries is to calculate the MAX over a longer period in the past, rather than being limited to the past month, broaden our research in the time dimension. So, we base our research on the highest value in the past 1, 2, 3 months Daily returns form a corresponding investment portfolio, and the results are demonstrated in Figure 3. Correspondingly, there is also a difference in average returns between high MAX and low MAX. Although these returns fluctuate, they generally show an upward trend. The above analysis shows that different measures of lottery-style returns will produce similar results. A positive rate of return can be generated between a high extreme rate of return and a low extreme rate of return, which can explain the expected return cross-section to a certain extent.

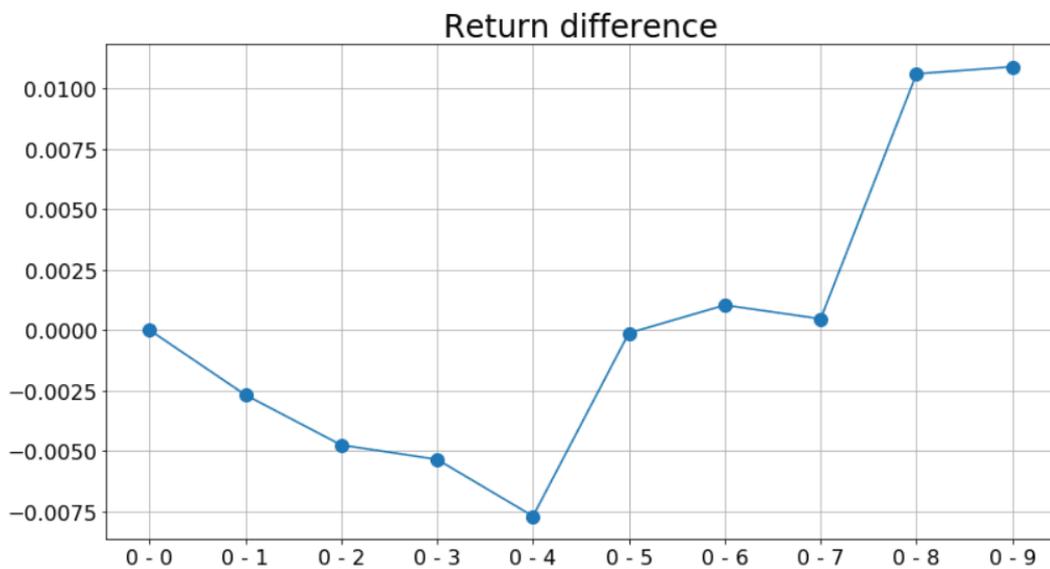


Figure 1 Portfolio average return differences based on maximum daily return over the past one month

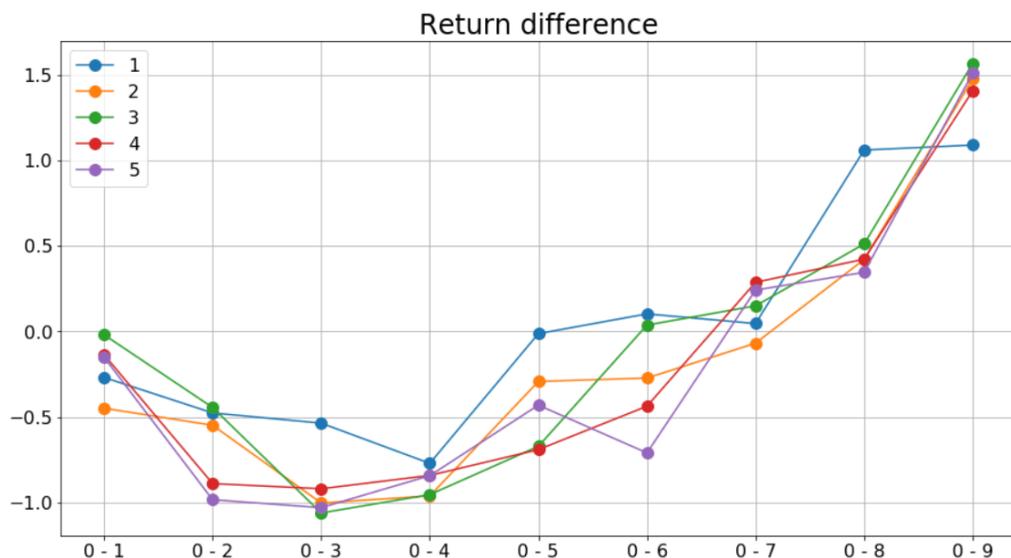


Figure 2 Portfolio average return differences based on maximum daily return over the past N month (N = 1 to 5)

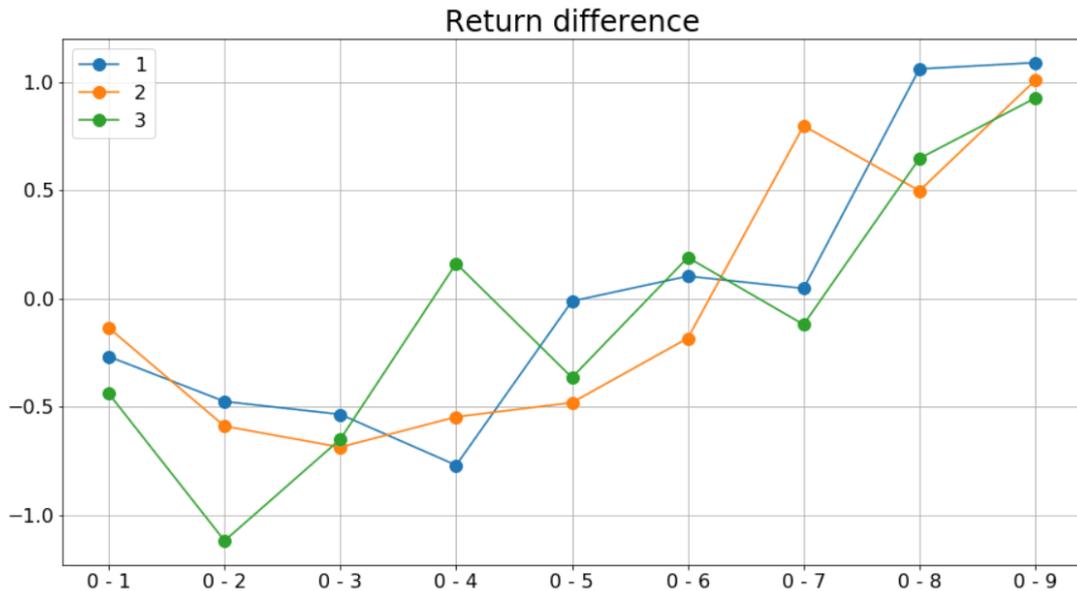


Figure 3 Portfolio average return differences in the next K month (K = 1, 2, 3)

4. Conclusions

This article examines the economic significance of lagging extreme positive returns (the relationship between the average of the maximum daily returns from the previous month and future returns). What is interesting is that the highest daily return as a sentiment indicator is unique. Investors, as non-professionals, will have certain irrational subjective emotional effects when investing. Due to the high risk returns of stocks and the nature of lottery, investors will pay too much attention to the extremely high single day returns in the past period and continue to buy. On the other hand, they are pessimistic about stocks with signs of lower limit and may choose to sell. In the aforementioned research, the highest single-day return of stocks in the past month was used as a sentiment indicator, and the results of constructing a long-short, hedged portfolio show that it can bring excess positive returns. The sentiment indicator of extreme positive returns has a certainly influenced on future positive returns prediction. The result can pass the robustness test, and it is robust to changing the method to measure sentiment indicators.

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