The analysis of double average strategy for Chinese famous liquor stocks Evidence from the MA5-MA10 and the MA-MA20 strategy

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Abstract. Contemporarily, various of quantitative strategy are implemented in financial market worldwide. In this paper, the suitability and performance of the two mean average strategy is evaluated based on multiple underlying assets in Chinese market. To be specific, the five-day and ten-day double average strategy or ten-day and twenty-day double average strategy are analysed. With the help of Tushare and PyCharm, this paper simulates quantitative trading of five well-known liquor stocks, including Kweichow Moutai, Wuliangye, Yanghe, Luzhou Laojiao and Shanxi Fenjiu, in a fixed period of time using strategies mentioned above. Afterwards, the performances are compared based on various indicators including annual returns and Sharpe ratios. According to the analysis, in the investment of well-known liquor stocks, the research of this paper can better help investors choose the right trading strategy has better performance than the other one as it can obtain more investment returns. These results shed light on guiding further exploration on quantitative strategy design for stock market.

Keywords: Low frequency quantitative transaction; double average strategy; well-known liquor stocks.

1. Introduction

Quantitative Trading based on Machine Learning can increase the stock exchanging competitive and further enhance stability in the Chinese financial market [1-5]. With the rapid development of computer technology, quantitative trading has been able to make full use of computer technology to realize automatic securities trading, which has also promoted the process of quantitative trading. Quantitative trading strategies can handle large amounts of data Establish securities database and data model, establish quantitative transaction timing model, and finally form stock selection model [6-8].

In the low-frequency quantitative trading, the frequently selected quantitative strategy is the double average strategy [9, 10]. Specifically, this strategy is to buy a stock when its average price in a relatively short period of time is greater than its average price in a relatively long period of time. The stock is sold when its average price in a relatively short period of time is lower than its average price in a relatively long period of time. Short term low-frequency quantitative trading usually refers to the average price of stocks within a relatively short time interval such as five-day average price, ten-day average price and twenty-day average price.

In Chinese stock market, with the consumption upgrading of Chinese consumers, the share of liquor stocks has also increased, bringing investors rich investment income. This paper will make a comparative study on which strategy can obtain a higher return when facing the five day-ten-day double average strategy and the ten-day-twenty-day double average strategy in liquor stocks. The rest part of the paper is organized as follows. The Sec. 2 will introduce the data origination, backtesting methods and the evaluation models. Subsequently, the Sec. 3 will demonstrate the results and discussions. Eventually, a brief summary will be given in Sec. 4.

2. Metodology

Programming with the help of Python and stock price data in Tushare, the five-day & ten-day double moving average strategy and the ten-day & twenty-day double moving average strategy are

adopted to conduct simulated trading of well-known liquor company stocks. Then, the trading results are compared.

2.1 Reasons of using Python and Tushar

As a powerful computer programming language, Python can easily capture and analyze network data. Tushare is a free and open-source Python financial data interface package. Stock data is easily obtained and analyzed by using Tushare. Because the data of Tushare is updated instantly and with high accuracy, and it can be closely integrated with python. Therefore, it is very convenient to use the data in the platform after registering on the Tushare platform.

2.2 Double moving average

Calculation formulae are given as follows:

Five-day average price=Sum of five-day closing prices/5

Ten-day average price=Sum of ten-day closing prices/10

Twenty-day average price=Sum of twenty-day closing prices/20

At present, the time of development and the scale of quantitative investment in China is short and small. In the future, quantitative investment will continue to develop, which is conducive to nurturing and strengthening institutional investors. There should be a reasonable understanding, an inclusive attitude, and appropriate guidance and norms of quantitative investment. This is of great significance for Chinese capital market to more effectively play the function of optimizing resource allocation. Also, this is important to helping Chinese residents maintain and increase their wealth. Due to the influence of China's stock trading system, same-day buying and same-day selling are not allowed. This makes quantitative trading in China very concerned about the changes in the average price of stocks over a period of time, such as the average closing price of stocks for five consecutive trading days and the average closing price of stocks for ten trading days. The double moving average strategy is a strategy for investing based on the average closing price of two different time periods. Take the five-day & ten-day double moving average strategy as an example, when the five-day closing average price of a stock is higher than its ten-day closing price, the stock will be bought. And when its five-day average price is lower than the ten-day average price, the stock will be sold. Choosing different double moving average strategies, such as the five-day & ten-day strategy and the ten-day & twenty-day strategy, will definitely have different returns. This article will study which strategy is better in the liquor sector stocks

2.3 Simulated trading

This paper selects the famous liquor stocks in the liquor sector of China's stock market to conduct simulated trading. Because the well-known liquor enterprises have formed a stable profit model after a long time of development, and its consumer goods attribute makes the well-known liquor enterprises will develop with the development of China's consumption, so the well-known liquor stock is a good investment target, favored by the majority of investors. In order to make the research more scientific, this paper selects five most famous liquor companies in China. The five stocks selected are: Kweichow Moutai, Wuliangye, Yanghe, Luzhou Laojiao and Shanxi Fenjiu. These five companies are the top companies in China's liquor industry, occupying the majority of the liquor market, with stable revenue and profitability, which can represent the development and progress of the entire Chinese liquor industry.

In order to compare the two strategies which is better more intuitively, this paper uses the stock data in PyCharm and Tushare to conduct quantitative simulated stock trading. The trading strategy is five-day and ten-day double average strategy and ten-day and twenty-day double average strategy. The specific operation process is as follows: Taking the stock of Kweichow Moutai as an example, assuming that there is an initial capital of 1 million Yuan, five-day and ten-day double average strategy is used to conduct simulated stock trading in a relatively long fixed period. When the five-day average price is greater than ten-day average price, all money is used to buy shares. When five-

day average price is less than ten-day average price, all shares are sold. After multiple trades within this fixed period, changes in funds will be seen, and pyCharm is used to calculate the annual return and Sharpe ratio of the investment round after the final trade. Then, this paper chooses the ten-day and twenty-day average strategy after the same operation, calculates the annualized return and Sharpe ratio in the new round of investment. Finally, by comparing the annualized return and Sharpe ratio of the two rounds of investment, this paper observes which double-moving averages is more conducive to investors' profit. Similarly, in accordance with the above operation mode, this paper conducts simulated quantitative trading for Wuliangye, Shanxi Fenjiu, Luzhou Laojiao and Yanghe Shares, and then compares which double moving average strategy will bring higher returns to investors. Finally, this paper comprehensively compares the performance of two kinds of double moving average strategies in the simulated trading of five stocks, and obtains which strategy should be chosen when the famous liquor stocks are faced with the choice of five-day and ten-day double moving average strategies and twenty-day double moving average strategies.

In order to complete a reference simulated quantitative trading in the specific trading strategy, it is necessary to select a relatively long and representative time period. This paper selects the seven years from 2015 to 2021 as the period of simulated trading. The reasons are as follows: Seven years is long enough. Over seven years, stocks would be bought and sold multiple times, whether five-day and ten-day or ten-day and twenty-day double moving average. Multiple operations can make the final conclusion more scientific and more reliable. In addition, during the seven years, there were many dramatic fluctuations in the world's economic conditions. The stock market had also seen wild swings amid uncertain economic conditions. In 2015, for example, China's stock market suffered multiple circuit breakers. In 2018, China's stock market suffered a prolonged decline due to trade disputes with the United States. In 2020, as a result of the Coronavirus outbreak and its aftermath, the stock markets of all countries in the world experienced a rapid decline and then a rapid rise in order to ease the economic pressure caused by the epidemic and implement policies to boost economic development. The global spread of COVID-19 has greatly impacted the real economy, affected the capital market from the perspective of investor sentiment and production and operation, and intensified the short-term fluctuations in the capital market The impact of COVID-19 on China's capital market is far more profound than that of SARS Compared with the United States, the response of China's capital market to the COVID-19 is relatively mild, which stems from China's effective epidemic prevention and control measures, sufficient liquidity supply and less panic, reflecting that China's capital market is more resilient The COVID-19 has not yet ended. China's capital market is still facing many challenges. It is necessary to orderly promote the resumption of work and production of the real economy, improve the quality of listed companies, improve the multi-level capital market system, strengthen the construction of the rule of law in the capital market, and strengthen the construction of the basic system of the capital market. Because the fluctuation of the stock market in these seven years is severe enough, it is more scientific to choose these seven years as the time period for simulating quantitative trading.

3. Results & Discussion

The following results can be obtained from the simulated quantitative trading of five underlying stocks according to the above specific trading strategies.

3.1 Kweichow Moutai

Based on the simulated quantitative trading of Kweichow Moutai stock given in Table. 1, this paper concludes that selecting the ten-day and twenty-day double moving average strategy for investment from 2015 to 2021 can achieve better annualized returns and Sharpe Ratio.

Table 1. Results for Kweichow Moutai.

Five-day ten-day strategy		Ten-day and twenty-day strategy	
Annualized income	Sharpe Ratio	Annualized income	Sharpe Ratio
16.38%	0.68	28.79%	1.13

3.2 Wuliangye

Seen from the simulated quantitative trading of Wuliangye stock in Table, 2, it can be concluded that when investing in Wuliangye stock from 2015 to 2021, selecting the five day and ten-day double average strategy for investment can obtain better annualized income and Sharpe Ratio.

Table 2. Results for Wuliangye.

Five-day ten-day strategy		Ten-day and twenty-day strategy	
Annualized income	Sharpe Ratio	Annualized income	Sharpe Ratio
24.35%	0.85	20.54%	0.67

3.3 Yanghe

Table 3. Results for Yanghe.

Five-day ten-day strategy		Ten-day and twenty-day strategy	
Annualized income	Sharpe Ratio	Annualized income	Sharpe Ratio
-1.77%	-0.55	-0.51%	-0.015

According to comparison of the simulated quantitative transactions conducted by Yanghe shares (demonstrated in Table. 3), it can be concluded that although the two double average strategies selected from 2015 to 2021 will cause losses, the ten-day and twenty-day double average strategy can reduce losses and be more beneficial to investors. The reason why Yanghe shares suffered losses in both double average trading strategies is that Shanxi Fenjiu began to develop rapidly in the secondary high-end Baijiu market in 2019, seizing a lot of market shares. Because the market share of Yanghe shares was seized by Shanxi Fenjiu, many large-scale funds chose to sell Yanghe shares, resulting in a large callback of Yanghe shares.

3.4 Luzhou Laojiao

By comparing the two strategies carried out by Luzhou Laojiao (shown in Table. 4), it can be seen that from 2015 to 2021, the investment income obtained by selecting the ten-day and twenty-day double average strategy is far greater than the return brought by selecting the five day and ten-day double average strategy.

Table 4. Results for Luzhou laojiao.

Five-day ten-day strategy		Ten-day and twenty-day strategy	
Annualized income	Sharpe Ratio	Annualized income	Sharpe Ratio
9.69%	0.29	21.31%	0.6

3.5 Shanxi Fenjiu

By comparing the two strategies of Shanxi Fenjiu (listed in Table. 5), it can be seen that selecting the ten-day and twenty-day double average strategy from 2015 to 2021 can obtain better annualized yield and Sharpe Ratio. The reason why Shanxi Fenjiu can achieve such an excellent rate of return is that the state-owned enterprise reform of Shanxi Fenjiu has shown great success since 2019. Since 2019, the share price of Fenjiu has started to rise rapidly and continuously at the annual level, so Shanxi Fenjiu has obtained excellent annual returns under the ten-day and twenty-day double average trading strategy.

Table 5. Results for Shanxi Fenjiu.

Five-day ten-day strategy		Ten-day and twenty-day strategy	
Annualized income	Sharpe Ratio	Annualized income	Sharpe Ratio
23.37%	0.66	33.07%	0.91

3.6 Limitations

Nevertheless, the analysis and results of this research have some defects and shortcomings. Primarily, the size of the datasets of daily frequency are small and the underlying assets quantality are limited. In addition, the parameter for the double mean average strategy are just fixed to 2 initial settings, where more cases ought to be discussed. Last but not least, more types of strategies should be taken into consideration for better comparison.

4. Conclusion

In summary, this paper investigates the performances of double mean average strategy and compares the results of different parameter settings. According to the analysis in terms of the seven years from 2015 to 2021, though the capital market is full of turbulence, selecting the ten-day and twenty-day double average strategy can obtain higher annualized income and better Sharpe Ratio than selecting the five-day and ten-day double average strategy when investing in the stocks of China's well-known Baijiu enterprises. Therefore, based on the analysis of simulated quantitative trading, this paper suggests that investors should choose the ten-day and twenty-day double average strategy when investing in the stocks of well-known Chinese Baijiu enterprises to obtain higher returns than the five-day and ten-day strategy, which is more conducive to investors to enlarge profits in trading

The value of this study lies in that with the development of China's capital market and the continuous improvement of the trading system, the choice of the double average strategy for simulated quantitative trading can be changed and refined in the above simulated trading in the future. Besides, the new double average strategy can be used for research, so as to put forward better strategic choices for investing in the stocks of China's well-known Baijiu enterprises. Overall, these results offer a guideline for further investigation of quantum strategies implementation in Chinese market.

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