

Performance Evaluation of Chinese Stock Mutual Funds

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Abstract: Based on a data from January 2003 to July 2020, I compare market index with mutual funds in Chinese stock market. First, I compare the cumulative return of market with that of mutual funds. Mutual funds have obvious advantages. Next, I compare their volatilities, Sharpe ratios, Sortino ratios, and maximum drawdowns. Based on these performance proxies, Chinese stock mutual funds still outperform the market index. Finally, I research the persistence of fund performance. Mutual funds with better performance in the past year tend to have higher returns in the next month.

Keywords: stock market, mutual funds, institutional investors, emerging markets

1. Introduction

There are three main investment methods for Chinese stock investors: direct investment in stocks, purchase of index funds, and purchase of mutual funds. Due to the huge difference in the returns of different investors' direct investment in stocks and the difficulty in statistics, I hope to compare the advantages and disadvantages of the two investment methods of purchasing index funds and mutual funds. First, I want to compare the returns of these two investment methods, and then the risks of the two. Past studies have shown that the risk factors of stocks include market risk-free interest rate, market value, book-to-market ratio, momentum and the stock's β [1], so the data I use include market risk-free interest rate, SMB factor (small market value minus big market value), HML factor (high book-to-market ratio minus low book-to-market ratio), and MOM factor (momentum).

I first calculated the cumulative return of the index, the cumulative return of the average return of mutual funds. Because there are many mutual funds in the market, I take the average return of mutual funds. The cumulative return of mutual funds is significantly higher than the index. Next, I need to compare the risk of indexes with that of mutual funds. Risk indicators include volatility, Sharpe ratio, Sortino ratio [3] and maximum drawdown. I calculated their volatilities, sharp ratios, Sortino ratios and maximum drawdowns of the index and fund respectively. Based on these comparisons, I have come to the conclusion that mutual funds are better than indexes in terms of both returns and risks.

Since investing in mutual funds is a better investment method than investing in index funds, what strategies should be adopted for investing in mutual funds in China? Past studies have shown that mutual fund performance is persistent [2] which means that funds with better performance in the past will have a better performance in the future. I further analyzed the data. I took the market return as the predictor variable and the fund return as the response variable. I conducted regression analysis on the data of 12 consecutive months and obtained the regression equation for each fund. For the regression equations of these funds, I rank funds with their α (Intercept), and compare the return of

the fund in the next month. In order to have large enough statistics, this calculation began in 2007. I found that from 2007 to 2020, when I rank mutual funds from high α to low α , the next month's average return of the top 20% fund is significantly higher than that of the bottom 20% fund.

Through the above analysis, I can draw a conclusion that investing in mutual funds is a better way to invest in China's stock market than investing in index funds. Due to the persistence of mutual fund performance, we can get a preliminary investment strategy to buy the fund with the best performance in the past 12 months.

This is just a very rough investment strategy. If we want to apply it to practice, we need to do more research. In terms of the investment strategy of the fund, we should also examine how long the performance of the fund is sustainable. For example, we can test the sustainability of funds in the past six months and two years. If there are more detailed data, we can also further study the investment strategy. Funds with better performance usually have a premium. We need to know whether this premium will offset their returns.

2. Data and Methodology

The data set I mainly use is

fund_monthly_return_riskfree_MarkAprem_SMB_HML_MOM_200301_202007_draft1.csv.

This dataset has 6 columns and 76,987 rows. The first column is the code of the mutual funds, the second column is the date, the third column is the monthly return of the corresponding fund, the fourth column is the monthly market risk-free interest rate, the fifth column is the market premium, market premium=the return of the index minus risk-free interest rate, the sixth column is the SMB factor, the seventh column is the HML factor, and the eighth column is the MOM factor.

3. Cumulative Return of Market and Mutual Funds

I set the initial net value of mutual funds and indexes to 1. From January 2003 to July 2020, the final net value of mutual funds is 12.4439, and the final net value of indexes is 3.9975. In other words, the cumulative return of mutual funds is 1144.39%, and the cumulative return of indexes is 299.75%. The cumulative return of mutual funds is about 3.82 times of the index. The chart below clearly shows the net value trend of mutual funds and indexes. Red represents mutual funds and blue represents indexes.

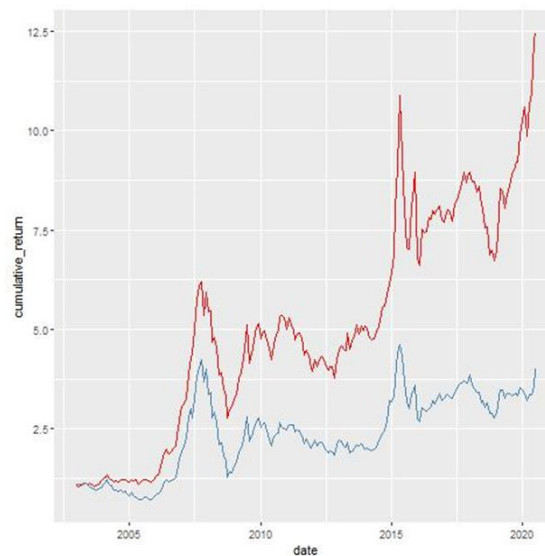


Figure 1: The net value of mutual funds and indexes

4. Volatilities, Sharpe Ratios, Sortino Ratios, and Maximum Drawdowns of Market and Mutual Funds

In order to further determine the risk of index and mutual funds, I calculated their volatilities, Sharpe ratios, Sortino ratios, and Maximum Drawdowns. The annual volatility of the index is 52.23%, and that of mutual funds is 45.36%. That is to say, there is a 68% probability that the index will rise or fall within 52.23% every year, and there is a 68% probability that mutual funds will rise or fall within 45.36% every year. Clearly, mutual funds are less volatile.

The annual sharp ratio of the index is 30.94%, and that of mutual funds is 45.23%. This shows that if the risk of index and mutual fund increases by the same margin, the return of mutual fund will increase more. In other words, if we want to increase the same return in the two investment methods, the risk of investing in mutual fund will be smaller.

Sortino ratio is a correction method of sharp ratio, which considers the excess return for each unit of downside risk. Through calculation, the Sortino ratio of the index is 17.70%, and that of mutual funds is 29.89%. The above data shows that when facing the same downward risk, mutual funds will get higher returns.

In terms of maximum drawdowns, the maximum drawdown of the index is 70.18%, and the maximum drawdown of mutual funds is 55.13%. The data still shows that mutual funds are less risky. Although in the net value trend chart above, it seems that the maximum withdrawal of mutual funds is larger, the maximum withdrawal of mutual funds is actually smaller after calculation.

The results I find in this study are consistent with [4] who discover that the Chinese actively managed stock mutual funds in aggregate exhibit significant skills to beat the market. In a sense, the Chinese actively managed stock mutual funds are serving as ‘Smart Money’ in the Chinese financial market. This confirms the intuition that the Chinese stock market is still more inefficient and exhibits many mispricings, that institutional investors are able to exploit.

5. Persistence in Mutual funds

According to the analysis of data, the average return of the next month of the top 20% α mutual funds is 5.63%, but the average return of the next month of the bottom 20% α mutual funds is -3.45%. This analysis demonstrates that there is persistence in the performance of mutual funds. As a preliminary strategy, investors can choose a group of funds with the best performance in the past year to invest.

The persistence of the Chinese mutual funds is in itself a both important and practical question. A more careful analysis is done by Chi and Qiao [5], who show that funds’ past 12-month returns or CAPM alphas are indicative of their future performance. In future research, how to make use of past information to form return-forecasting signals within the mutual fund space is a fruitful direction.

6. Conclusion and Extension

Fund performance is better than the market, so fund investment will be better than index investment. In terms of investment strategy, investors can invest in a package of funds that have performed better in the past. This is just a rough strategy. If it is really to be applied in practice, it needs more detailed research.

Some fruitful directions for future research may further explore how an investor may do even better than the average mutual fund performance by selecting the top mutual funds based on their past performance. This would relate to the concept of performance persistence. That is, can the mutual fund managers that outperform keep doing so in the future? If the answer is yes, then there is performance persistence, and investors may exploit this fact to generate even more superior returns by forming a Fund of Mutual Funds (FoMF) strategy.

References

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Appendix

In this table, I show the data to compare index and mutual fund, including cumulative net values (start from 1), cumulative returns, volatilities, Sharpe ratios, Sortino ratios, and maximum Drawdowns.

Table 1: Comparisons between index and mutual funds.

	Index	Mutual Funds
Cumulative net values (start from 1)	3.9975	12.4439
Cumulative returns	299.75%	1144.39%
Volatilities	52.23%	45.36%
Sharpe ratios	30.94%	45.23%
Sortino ratios	17.70%	29.89%
Maximum Drawdowns	70.18%	55.13%