Analysis of Value Investment Beta Risk Control Strategy

Manlin Zhang

Guizhou University of Finance and Economics, Guiyang 550025, China.

Abstract: The β coefficient in the capital asset Pricing Model (CAPM) represents the systemic risk of assets, which measures the sensitivity of asset returns to the change of the whole market index returns. This paper mainly selects the constituent stocks of CSI 300 as the asset allocation targets, and selects the top five and the bottom five stocks in the β coefficient through the ranking of the β coefficient. Based on the research on the capital asset pricing model, different Beta strategies are adopted. Finally, the results of the stock portfolio constructed with different strategies based on the current A-share market are analyzed, and then the applicability of Beta risk control strategy in China's A-share market is expounded.

Keywords: Value Investment; β Coefficient; Return Rate

1. Research background

On the basis of the study on CAPM model, some scholars, when studying how to obtain excess returns, found that in the capital asset pricing model, using Beta strategy, namely holding high Beta portfolio and short low Beta portfolio, can obtain significantly positive Alpha value, which means that Beta investment strategy can obtain excess returns.

2. Research content

This paper selects the top 5 and bottom 5 constituent stocks with the β coefficient of the CSI 300 index in 2020 to make different configurations of the 10 component stocks in two different Beta risk control strategies, calculate the return rate through different selection of 10 stocks and the allocation of different weights, and compare them with the change ratio of the CSI 300 index.

Strategy in China's securities market rising choose β coefficient of larger securities, found stocks rose not completely related to the market, select the market has the upward trend period of the β coefficient size, the β coefficient before five and five stocks into two groups, figure out two groups of 10, stock, weight after building two portfolio, calculate the yield of the two portfolio investment. Comparing the portfolio yield and the change ratio of the CSI 300 index to verify whether stocks buying high Beta values when the market is rising can get higher returns than the CSI 300 and low Beta combinations.

Strategy 2 By configure 10 constituent stocks, build a portfolio with β coefficient =1, and then short the corresponding number of CSI 300 index futures to determine whether a risk-free arbitrage portfolio can be constructed through this strategy to extract the excess Alpha return (Beta + Alpha-Beta = Alpha).

3. Analysis of value investment Beta risk control strategy

3.1 Value investment Beta risk control strategy

By sorting the size of β coefficient of CSI 300 stocks from January 1,2020 to December 31,2020 (the data are from Guotai Junan CSMAR database), the 5 stocks with the highest Beta coefficient and the 5 stocks with the lowest Beta coefficient were selected:The Yangtze electric power's β coefficient is 0.318;Shanghai medicine's β coefficient is 0.437;Agricultural bank's β coefficient is 0.465;Bank Of China's β coefficient is 0.491;Sinopec's β coefficient is 0.5;Caitong Securities's β coefficient is 1.74;Hongta securities' β coefficient is 1.767;Citic construction investment's β coefficient is 1.818;Zheshang securities' β coefficient is 1.9;Sinolink Securities' β coefficient is 1.92

3.2 Beta Risk Control Strategy I and data analysis

Among the 5 selected stocks in this paper, the β coefficient is less than 1, and these 5 stocks have little correlation with the market. The

other 5 β coefficients greater than 1 have a large correlation with the market.the theoretical yield of 100 stocks is calculated in the following table:

Table 3-2

Shibor	1.59%	market return	25.51%
name	β coefficient	CAPM price	rate of return
The Yangtze electric power	0.31841	9.21%	7.70%
Shanghai medicine	0.43707	12.04%	6.31%
agricultural bank	0.46519	12.72%	-11.55%
Bank Of China	0.49114	13.34%	-9.92%
Sinopec	0.49965	13.54%	-17.92%
Caitong Securities	1.74052	43.21%	39.32%
Hongta securities	1.76703	43.85%	11.38%
Citic construction investment	1.81808	45.07%	35.14%
Zheshang securities	1.89975	47.02%	38.34%
Sinolink Securities	1.91965	47.50%	74.01%

Market on the rise, agricultural bank, bank of China, sinopec yield instead of negative, the other seven stocks are not fully conform to the β measure of market volatility, this and through the CAPM theoretical yield has a certain gap.

The CSI 300 will be on an upward trend in 2020. So choose the whole year of 2020 as the time interval of strategy one.

When the CSI 300 index rises, portfolio A is constructed by weighted average for the stocks with β coefficient greater than 1 at the closing price on January 2, and the return rate of portfolio A is 35.66%

When the CSI 300 index rises, portfolio B is constructed by weighted average by using the closing price of stocks with a β coefficient less than 1 on January 2, and the return rate of portfolio B is calculated as 1.82%

When the market shows rising trend, the yield of portfolio A for stocks with β coefficient greater than 1 is 35.66%, which is 25.51% greater than that of CSI 300 index; the yield of portfolio B for stocks with β coefficient less than 1 is 1.82%, which is less than the increase of 25.51% of CSI 300 index. The yield on portfolio A was found to be significantly greater than that on portfolio B. The weighted β values of portfolio A and B are 1.786417132 and 0.449750223 respectively, yielding 44.31% and 12.35% respectively. The actual returns of both portfolio A and B are both smaller than the theoretical yields of portfolio A and B.

The β coefficient of portfolio A is> 1, which shows a strong correlation with the market; the β coefficient of portfolio B is <1, and β shows A weak correlation with the market. When the market is rising, the yield of portfolio A is 35.66% greater than the rise of the CSI 300 index is 25.51%, which shows a correlation between β and the market. Portfolio B yield 1.82% less than the csi 300 index rose degree, also less than portfolio A suggests that the market may exist high Beta low Alpha phenomenon.

3.3 Beta risk control Strategy II and data analysis

Build a Beta = 1 combination with these ten stocks

By constantly trying to change the weight to get a portfolio C with β approximately 1, and then short the corresponding number of CSI 300 index futures, to build a portfolio D with Beta coefficient =0. Since there are only contracts in January 2020 in 1,2,3, June, and September 2020, the delivery date of futures is generally completed on the third Friday of the month, and January 1,2020 and September 1,2020 are selected as the time range to calculate the combined return rate.

Strategy 2 first adjusts the weight of the 10 stocks to build a β coefficient equal to 1 portfolio C, which is a portfolio that is basically consistent with the market volatility. Study whether individual stocks with extreme β values will have an impact on the investment results. On the basis of the above, sell short the corresponding CSI 300 stock index futures, build a β=0 portfolio D (Beta + Alpha-Beta = Alpha), and get excess Alpha returns through this hedging method. In Strategy 2, the analysis of the return rate of portfolio D is 3.73%, which is 1.59%

higher than the risk-free interest rate (Shibor).

Through the above experiment, the β coefficient is equal to 1 to adjust the weight of different stocks build different portfolio E, F, G, portfolio E and portfolio F is by adjusting the β coefficient size in the middle of the weight of several stocks to ensure the β coefficient is approximately 1, portfolio G is 10 stocks weight adjustment allocation to ensure the β coefficient approximately 1. It is calculated that the returns of the three portfolios are E =18.88%, F =19.66% and G =20.29% respectively. After reducing the returns of CSI 300 stock index futures by 18.4%, the excess returns of several portfolios are 0.48%, 1.26% and 1.89% respectively. The return rate of the three combinations is greater than 0, indicating that in China's securities market, we can construct a portfolio with β coefficient equal to 1 and then short a portfolio with β coefficient to separate the excess return. Since the average β number of 10 stocks is> 1, reduce the weight of high Beta stocks while increasing the weight of low Beta stocks to ensure β =1. Since portfolio E and F are adjusted β stocks in the middle, the β coefficient closer to 1, And G is the adjusted stock, The calculated yields are all lower than the portfolio D by adjusting the extreme β coefficient, Assuming that the market has high Beta low Alpha and low Beta high Alpha, And Alpha of high Beta stocks will deviate less than Alpha of low Beta stocks, When using Strategy II to build a portfolio, Using stocks with β coefficient greater than 1 and stocks with β coefficient less than 1 constructed a portfolio with β approximately equal to 1 yield β the yield of a stock portfolio approximately equal to 1. Based on the assumptions, the portfolio H is constructed, and the yield of the portfolio H is 30.62%.

The portfolio H constructed by allocating the two stocks with the smallest β coefficient and the two stocks with the largest β coefficient achieved a higher excess yield of 12.23% than the other four portfolios, far greater than the risk-free interest rate (Shibor).It may be the presence of Beta alien, and the A l pha deviation of stocks with small β coefficient will be greater than the Alpha deviation of stocks with larger β coefficient.

4. Domestic applicability analysis of Beta risk control strategy for value investment

In China's securities market, by judging the future trend, with the β value and the size of the market correlation to choose stocks is unreliable, illustrates the stock basic not according to the CAPM model forecast, even individual stock reverse changes, only by stocks β size to choose stock asset allocation may be expected earnings differ a lot.

References

[1] Wang YT. An Empirical Study on Stock Risk Based on β Coefficients [J]. Journal of Heilongjiang Institute of Engineering, 2018,32 (06): 47-50.

[2] Huang YB. Empirical test of the "Beta vision" in the A-share market [D]. Southwestern University of Finance and Economics, 2019.52-53.

[3] Qi YL. Analysis on the existence and cause of Beta jump in Chinese stock market [D]. Dongbei University of Finance and Economics, 2019.115-116.

[4] Yin L. Empirical analysis of the Beta investment strategy [D]. Nanjing University of Science and Technology, 2018.39-40.

[5] Zhang JY. Effect of volatility on the benefits of the beta-neutral strategy [D]. Dongbei University of Finance and Economics, 2019.12-14.

[6] Xu JW. Influfactor of beta coefficient —— empirical analysis based on stock data of 451 listed companies [J]. Economics and Management Research, 2015,36 (10): 130-137.

About the author:

Zhang Manlin (1998-), female, Han Nationality, from Yichang, Hubei province, postgraduate student, research direction: Finance and regional economic development