

Trading Volume and Stock Return: A Study Based on Continuous Interval Portfolio

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Abstract

This paper uses the all A-share data of China's stock exchange market from October 12, 2016 to August 31, 2020 to study the correlation between stock trading volume and return by constructing a continuous interval portfolio. The results show that there are both "inertia" and "reversal" trends in China's A-share market return, and the scale characteristics divided by stock trading market value have a significant impact on this trend. The results are of significance to make the capital market cooperate with the economic development and transformation. We analysis the characteristics of the stock market in the stage of economic development and transformation, and give suggestions accordingly.

Keywords

Stock trading volume; Continuous interval portfolio; Stock return.

1. INTRODUCTION

Efficient market theory holds that the stock price in the strong efficient market already contains all the information, and the stock trading volume has no predictive effect on the future return of the stock. The traditional asset pricing CAPM model based on the efficient market hypothesis believes that there will be no speculative trading in the balanced stock market, so the trading volume is completely ignored in the model. However, the actual stock market will be affected by many external factors. The information environment, investor structure and investment behavior do not meet the efficient market hypothesis, and there are many volume price phenomena that can not be explained by CAPM model. The relationship between stock trading volume and stock price change is one of the typical examples.

Research shows that trading volume has a direct impact on stock return volatility, which has not been shaken until now [1]. However, there are disputes about the relationship between stock price and trading volume in academic circles. One view is that high trading volume can promote the transparency of trading information, reduce uncertainty, reduce investment risk and enterprise capital cost, so as to improve the market value of the company and then raise the stock price, that is, high trading volume stocks are expected to obtain positive returns, while low trading volume stocks are expected to obtain negative returns, showing the phenomenon of "inertia" [2-3]. The second view is that investors' psychology will affect the stock price and make it deviate from the basic value excessively, so the stock price will have a "reversal" trend, and taking the trading volume as a proxy variable can better represent the psychological characteristics of investors [4-6]. In addition, by studying the trading volume premium of stock markets in various countries, some scholars found that the change trend of stock price has different characteristics under the influence of different countries, enterprise characteristics and investor structure [7-8].

A large number of scholars analyze the relationship between transaction volume and yield from different angles, and draw corresponding conclusions. However, the research on this

subject from the perspective of enterprise scale and market trend is not enough. On the other hand, the literature considering the factors of stock portfolio is not enough. Because stock returns often have complex asymmetry, which deviates from the basic assumptions of most traditional models, there may be model errors.

Due to the late development of China's A-share market, the trading mechanism is not perfect, and there are great differences between China's A-share market and the stock markets of developed countries and regions, the investor structure is also very different, and the investment philosophy is also different. This leads to the fact that the characteristics of China's capital market are often different from foreign research results. In addition, since China's economy began to transition to high-quality development, the changing characteristics of the capital market are different from those in the past. Therefore, from the perspective of enterprise scale, market change trend and stock portfolio, and using the new data in recent years, it is of full research significance to re-examine the correlation between stock trading volume and return, or to make an innovative supplement to the existing research.

2. METHODOLOGY

2.1. Analysis on the Relationship Between Expectation gap and Innovation Investment

Referring to Gervais's grouping method [9], this paper divides the whole sample period into multiple intervals. Each interval includes the observation period of the first 49 days and the portfolio construction period of the last day, with a total of 19 non overlapping intervals. Considering the sample period and data integrity, the interval constructed in this paper is coherent and does not have an interval of one day. This is different from Gervais.

A large number of studies show that enterprise size has a significant impact on stock dynamic returns. Therefore, it is necessary to make a comparative study on all trading stocks grouped by enterprise size. In this paper, the stocks in all sample periods are grouped according to the daily circulating market value of each interval, and the first 30% of the stocks in the market value scale are divided into large enterprises, followed by 60% of the stocks are small enterprises, and the last 10% of the stocks are directly discarded because the enterprise scale is too small, the fluctuation is large and the impact on the market is not significant.

Within the group divided by scale, high trading volume stocks and low trading volume stocks are divided according to the ranking of daily trading volume of each interval in the whole interval. Among them, the stocks in the top 10% are defined as high trading volume stocks and the stocks in the bottom 10% are defined as low trading volume stocks. Based on the above division method, four groups are obtained: low transaction volume of large enterprises, high transaction volume of large enterprises, low transaction volume of small enterprises and high transaction volume of small enterprises.

Based on the above grouping, this paper constructs the investment portfolio, and carries out equal weight allocation to each group of stocks in each trading interval to form each investment grouping. The log return rate of closing price is used to represent the cumulative return rate of each group in this time period.

$$R = \log P_{t+n} - \log P_t$$

In the above formula, R represents the cumulative yield on the nth day of the test period. P_t is the stock price in the construction period of the t trading interval. The average rate of return of high trading volume portfolio and low trading volume portfolio in the whole sample period is the average rate of return of each trading interval portfolio.

$$\bar{R}^h = \frac{\sum_{i=1}^{19} \sum_{j=1}^{M_i^h} R_{ij}^h}{\sum_{j=1}^{19} M_i^h}$$

$$\bar{R}^l = \frac{\sum_{i=1}^{19} \sum_{j=1}^{M_i^l} R_{ij}^l}{\sum_{j=1}^{19} M_i^l}$$

$$\bar{NR} = \bar{R}^h - \bar{R}^l$$

In the above formulas, \bar{R}^h is the average rate of return of high trading volume stocks. M_i^h is the number of high trading volume stocks in interval i . \bar{R}^l is the average rate of return of low trading volume stock portfolio. M_i^l is the number of low trading volume stocks in interval i . \bar{NR} is the difference between the rate of return of high trading volume stock portfolio and low trading volume stock portfolio.

We select the data of all a shares in China's stock market from October 12, 2016 to August 31, 2020, including stock code, trading time, daily closing price, daily trading volume, daily trading scale and trading status. The daily trading volume is represented by the number of individual shares in circulation and the daily trading scale is represented by the market value of individual shares in circulation. The whole sample excludes all stock trading data in abnormal trading state and missing stock data.

3. RESULTS AND DISCUSSION

3.1. Descriptive Statistics of the Main Variables

We make statistical analysis on the four groups of China's A-share market respectively. The results show that there is a great difference between the median and average value of each group, and the data shows an obvious skew distribution, which does not meet the assumption of normal distribution of data series. In addition, the average stock price and median stock price of low trading volume portfolios of different size groups are higher than those of high trading volume portfolios of corresponding size groups, and the former is far lower than the latter in terms of trading volume or trading scale. This means that the low trading volume portfolio shows a serious risk premium and lack of market demand during the test period. The descriptive analysis is shown in Table 1.

Table 1. Descriptive statistics of main variables

Enterprise scale		small		large	
turnover		low	high	low	high
share price	average	23.20	7.71	49.62	11.56
	median	16.55	6.35	32.72	8.32
trading volume	average	917493	60131729	1023978	83395006
	median	863922	49255565	960900	57333065
trading scale	average	3236003	5243291	17247166	78520904
	median	2749966	5159544	12383633	26339726

3.2. Analysis of Average Return of Continuous Interval Portfolio

In order to further study the impact of stock trading volume on future returns, the sample mean test is conducted on the returns of each trading volume portfolio during the test period. The results show that the returns of low trading volume portfolios of large enterprises in the next 1, 5 and 10 days do not have sufficient significance level, while the average values of all

other groups are significant. Among the four trading volume portfolios, the two groups with high trading volume showed significant positive returns, the group with low trading volume of small enterprises showed significant negative returns, and the positive and negative returns of the three groups of portfolios did not change, while the returns of the group with low trading volume of large enterprises showed a "reversal" in the next 5 and 10 days, From less significant positive returns to significant negative returns. In addition, the trend of the four trading volume portfolios is relatively similar. It shows a downward trend from the next day to the next 50 days. The results are shown in Table 2.

Table 2. Average return of continuous interval portfolio

Testing period		1	5	10	20	30	50
large enterprises	low trading volume	0.00195* (-2.39)	0.000163 (-0.2)	-0.00125 (-1.47)	-0.00352*** (-3.97)	-0.00565*** (-6.1)	-0.00723*** (-7.38)
	high trading volume	0.0343*** (-97.34)	0.0329*** (-92.16)	0.0313*** (-86.98)	0.0285*** (-78.48)	0.0264*** (-71.39)	0.0241*** (-62.23)
	difference	0.0324	0.0327	0.0326	0.0320	0.0321	0.0313
small business	low trading volume	-0.0230*** (-83.91)	-0.0246*** (-89.34)	-0.0257*** (-91.45)	-0.0273*** (-94.19)	-0.0280*** (-91.96)	-0.0287*** (-87.04)
	high trading volume	0.0293*** (-49.89)	0.0274*** (-43.77)	0.0250*** (-38)	0.0212*** (-29.34)	0.0181*** (-22.92)	0.0128*** (-13.6)
	difference	0.0523	0.0520	0.0507	0.0485	0.0461	0.0415
<i>t statistics in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001</i>							

From the above analysis, it can be concluded that the enterprise scale has an important impact on the correlation between trading volume and yield. The stocks with low trading volume of large enterprises show an obvious "reversal" phenomenon, while the other three groups show a significant downward trend of yield, but because the positive and negative have not changed, it can not be judged that there is a significant "reversal". In addition, the returns of high volume portfolios of small and large enterprises are greater than those of low volume stock portfolios. Among them, the yield difference of different trading volume portfolios of small enterprises is larger than that of large enterprises.

3.3. Trend Analysis of Average Return

The above results show that the portfolio of China's A-share market under the grouping of trading volume may show a "reversal" trend. In order to further verify the existence of this trend, this paper further takes the construction period as the origin, calculates the return of the trading ranges on both sides relative to the construction period, and makes a comparative analysis based on this, and obtains the average return trend of the portfolio in each interval.

It can be seen from Figure 1 that the yield of stocks with high trading volume is at a relatively high point in the whole sample period, with a large increase; The return rate of low trading volume stocks is relatively low in the whole sample period, and has a certain decline. The return rate of low trading volume group of small enterprises is significantly lower than that of low trading volume group of large enterprises. Except for the high trading volume group of small enterprises, the stock prices of the other three groups during the construction period are at an inflection point, showing an adjustment trend in the sample period, with a decline in yield and trading volume; And although the positive and negative of the rate of return has not changed, but taking the construction period as the inflection point, the trend of the rate of return has changed, and the "reversal" trend is significant. Although the high trading volume group of small enterprises showed a downward trend as a whole, there was still an accelerated change in the yield trend similar to the other three groups from the beginning of the construction period. This abnormal trend may be related to the national support policies for small and medium-sized enterprises.

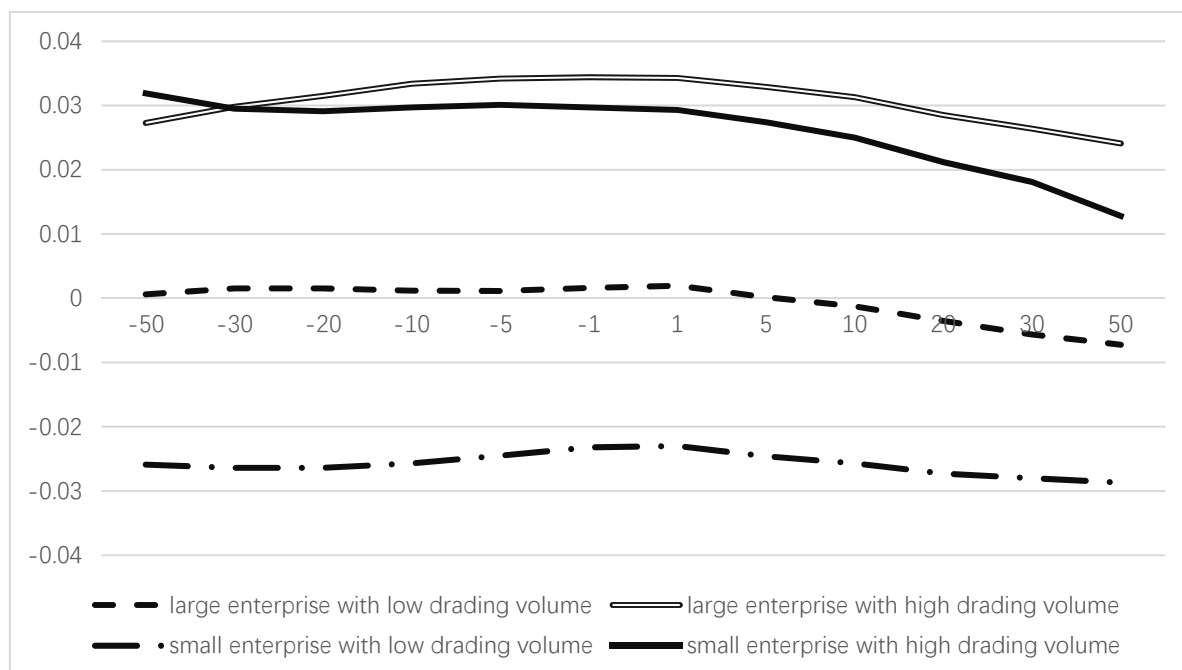


Figure 1. Average return trend of continuous interval portfolio in adjacent intervals

4. CONCLUSION

According to the above results, there is both "inertia" and "reversal" between stock trading volume and yield in China's A-share market, that is, on average, although the stock price of stocks with high trading volume in the current period will rise significantly in the future, the rising trend of stock price will decrease; Although the share price of stocks with low trading volume in the current period may rise or maintain slightly in the short term, there may be a reversal or significant decline in the long term in the future. High trading volume portfolio strategy will obtain significant positive returns compared with low trading volume portfolio strategy. In addition, enterprise size has an important impact on the trading volume and portfolio return. The stock investment strategy return of large enterprises is more significant than that of small enterprises. These conclusions may mean that policy makers can obtain the signal of the development trend of the capital market from the perspective of stock trading volume and trading market value, and formulate corresponding rules and regulations accordingly, so as to make better use of the capital market to cooperate with the smooth progress of China's economic development and transformation.

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