

# CAN SHORT RATIOS PREDICT ABNORMAL RETURNS?

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## **Abstract**

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In this study we examine the relationship between short ratios and abnormal returns on the Nasdaq100 Index between May and July 2010. Our goal is to investigate whether short ratios can predict short-term abnormal returns and to examine to what extent short ratios of 3 and 5 can serve as bear and bull market predictors. Our results show that in general short ratios are poor predictors of abnormal returns. However, in a relatively small number of Nasdaq100 firms with an average market capitalization of \$4.8B, there is a significant negative correlation between short ratios and abnormal returns. An examination of the established benchmarks of 3 and 5 for bear and bull markets reveals a significant negative relationship between abnormal returns and short ratios for firms with a short ratio greater than 3. This result casts doubt on some analysts' hypothesis that a short ratio greater than 5 suggests a bull market because it signals a strong potential demand for stock. Instead, the results support those analysts who believe that a high short ratio implies the opposite

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## **1. Introduction**

A short ratio is the number of shares of a security that investors have sold short divided by the average daily volume of the security (measured over 30 days or 90 days). Investors short a stock if they believe its price is going to fall and they will profit by buying the stock later on at a lower price. According to this reasoning, stocks with a relatively low short ratio should perform better than stocks with a higher short ratio. These analysts consider a short ratio of 5 and higher a bullish indicator and a short ratio of 3 and lower a bearish indicator. The aim of this research is to

determine if short ratios can be used as a bullish or bearish indicator and examine the ability of short ratios to predict abnormal returns.

On the other hand, some analysts see a high short ratio as signaling potential demand for the stock by those who previously sold short and have not covered their short sale. Covering a short sell is known as a "short squeeze." Once it begins, a short squeeze accelerates the rise in the stock's price because short sellers are anxious to cover their short sales as quickly as possible.

## 2. Scientific Background

Earlier research has investigated the relationship between the abnormal returns of stocks and short sellers' interest in them. Brent et al. (1990), Figlewski and Webb (1993) and Woolridge and Dickinson (1994) found no evidence of a strong relationship between short positions and abnormal returns. On the other hand, in their UK sample, Doukas et al. (2007) found that stocks that are of little interest to short sellers experience significant positive returns on both an equal and value-weighted basis. Boehmer et al. (2007) found that stocks heavily shorted by institutions underperformed the next month by 1.43%. They concluded that on average, short sellers are important contributors to efficient stock prices. In addition, short sellers are extremely well informed and institutional short sellers are the best informed. Asquith and Muelbroek (1996) found a strong and consistent relationship between short interest and excess returns. Shares with high levels of short interest perform significantly worse than comparable shares without high levels of short interest.

## 3. Data and methodologies

In the following research we used three months' worth of data provided by

“Yahoo Finance” from all of the Nasdaq100 stocks. The three months covered the period from May to July 2010. First, we used the May data to calculate the averages for short ratios. Then, we used the data from June and July to calculate the cumulative abnormal returns as follows:

$$AB\ Return = \sum_{i=1}^M R_i - RI_i$$

(1) where:  $AB\ Return$  = the excess return of a specific stock over the index (Nasdaq100),  $R_i$  = the return of a specific stock in week  $i$ ,  $RI_i$  = the return on the index in time  $i$ .

Second, we calculated the correlations between the short ratios and the measured abnormal returns for the entire sample. Third, in order to check whether size was a factor that influenced the examined correlations, we grouped our sample stocks into four groups according to their market capitalization and re-examined the correlations. Fourth, we grouped our sample into three groups according to benchmarks accepted by analysts. Group 1 contained stocks with a short ratio greater than 5, group 2 contained stocks with a short ratio between 3 and 5 and group 3 contained stocks with a short ratio less than 3. We then examined the correlations between the

short ratios and the abnormal returns in each group. Finally, we conducted a simulation test on two portfolios we constructed, each containing 10 stocks traded with the higher/lower short ratio and compared those portfolios'

performance to the three-month cumulative returns of the Nasdaq100 index.

#### 4. Results:

Table 1 summarizes the descriptive statistics of our sample:

**Table 1: Descriptive Statistics**

	Mean	Std.	Maximum	Minimum
<b>ABR</b>	0.09	12.17	38.03	-63.35
<b>Short Ratio</b>	3.61	2.69	13.60	0.40
<b>Mar Cap</b>	23.66	42.31	245.02	2.58

- Notes: 1. ABR = percentage of cumulative abnormal returns.  
2. Mar Cap=market capitalization of the firm in billions of US dollars.

The table shows that during May 2010 the mean short ratio of the Nasdaq100 stocks was 3.61, which is between the analysts' bullish 5 and bearish 3 figures. Moreover, the mean abnormal return of the examined stocks was close to zero during June and July 2010. Pearson's correlation between cumulative abnormal returns and short ratios resulted in a non-significant correlation (0.009,  $p=0.468$ ), meaning there was no association between the two variables in the entire sample.

Given that the short ratio is the division of the number of shares sold short by the average volume of trade, it is reasonable to assume that the size of the firm can influence the relationship between short ratios and abnormal returns. In order to examine the "size effect," we divided our sample into four equal groups according to their stock market capitalization. Table 2 presents the descriptive statistics of each group's size and the correlations between abnormal returns and short ratios within each size group.

**Table 2: Descriptive Statistics and Correlations by Group Size**

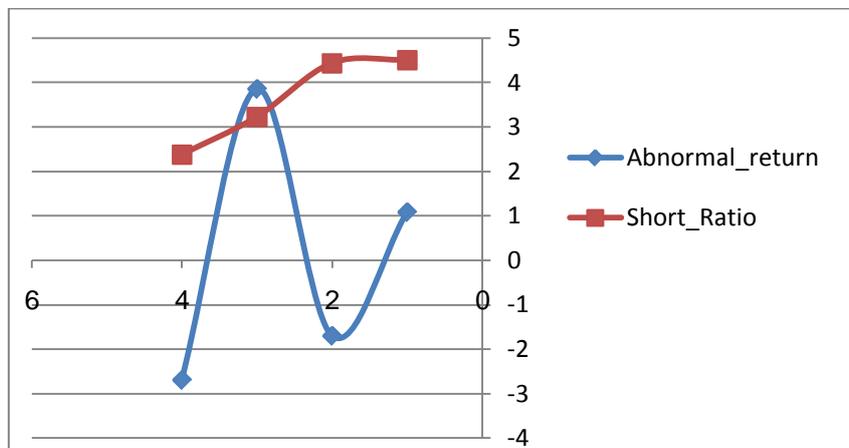
Group	1	2	3	4
<b>ABR</b>	1.08	-1.69	3.85	-2.68
<b>Short Ratio</b>	4.50	4.43	3.22	2.37
<b>Correlations</b>	<b>-0.28 (0.09)</b>	-0.08 (0.34)	0.16 (0.23)	0.05 (0.39)
<b>Mar Cap</b>	4.80	7.31	12.37	67.45
<b>N</b>	22	23	23	24

Notes: 1. ABR = percentage of cumulative abnormal returns.  
 2. Mar Cap=market capitalization of the firm in billions of US dollars.  
 3. The number in the bracket is the significance level.

Table 2 shows that the correlation between abnormal returns and short ratios changes with the firm's size, moving from a significant negative relationship for small firms (at the 10% significance level) to a non-significant positive relationship for relatively large firms. The table also shows that small firms are traded with higher short ratios than larger firms. This fact does

not necessarily mean that investors are betting that the stock price of smaller firms tends to fall more than that of larger firms because the short ratio takes into consideration the average volume of trade, which is obviously larger for bigger firms. Graph 1 presents the average short ratios and abnormal returns by size groups.

**Graph 1: Cumulative Abnormal Returns and Short Ratios by Size Groups.**

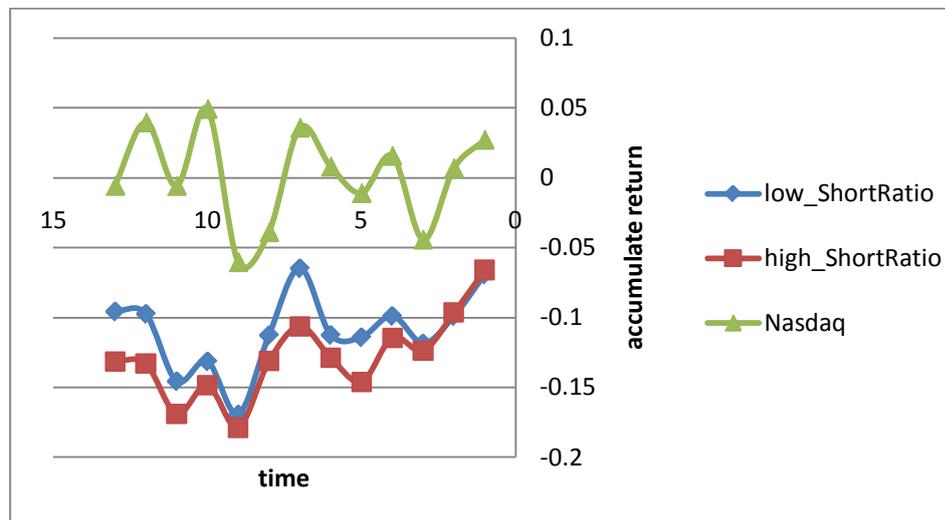


The graph illustrates the data in Table 1. Group 3, which has an average market capitalization of \$12.37B, has the highest abnormal returns. There was no significant correlation between short ratios and abnormal returns in the entire sample.

As noted earlier, we then constructed two portfolios to test whether stocks with the highest and lowest short ratios

could outperform the Nasdaq100. Each week between May and July 2010 we changed the stocks in those two portfolios according to their short ratio so that one portfolio always held the stocks with the highest short ratios and the second always held the stocks with the lowest short ratios. The results are summarized in Graph 2.

**Graph 2: Cumulative Returns of High/Low Short Ratios Portfolios and the Nasdaq100**

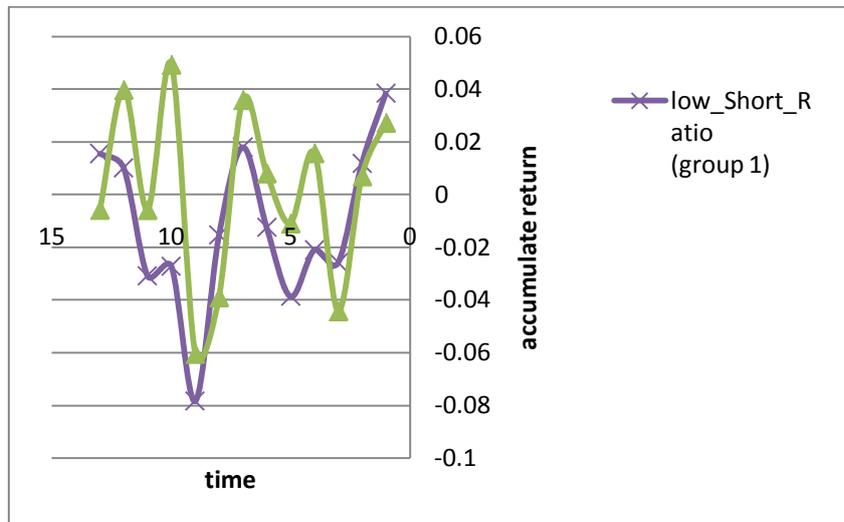


Graph 2 demonstrates that neither the high nor the low short ratio portfolio outperformed the Nasdaq100 Index. Over the three months of the study, the portfolios with the low short ratios and the high short ratios lost 0.09 and 0.013, respectively. This result calls into question the notion that the short squeeze signals potential market strength and supports the opposite hypothesis about a negative

relationship between returns and the short ratio.

Since we found a negative correlation between abnormal returns and short ratios in the small size group (see Table 2), we performed another simulation test on a third portfolio that contained the smallest companies with the lowest short ratios. The results of that third simulation test are shown in Graph 3.

**Graph 3: Cumulative Returns of a Portfolio of Relatively Small Firms with the Lowest Short Ratios and the Nasdaq100.**



Our simulation found that the portfolio containing the smallest companies with the lowest short ratios outperformed the Naadaq100, gaining a positive cumulative return of 0.018 compared to the Nasdaq100's -0.01 return during the three months of the study.

We then examined the efficiency of established short ratio figures in predicting abnormal returns. In Section 1 we mentioned that short ratios of 3 and 5 are considered benchmarks for

recommending a long, bullish or a short, bearish investment strategy. We have also discussed the debate among analysts as to whether a high short ratio is a bullish or bearish signal. In order to conduct the test, we split the data into three groups according to the benchmarks of 3 and 5 and tested the correlations between cumulative abnormal returns and short ratios within each group (see table 3).

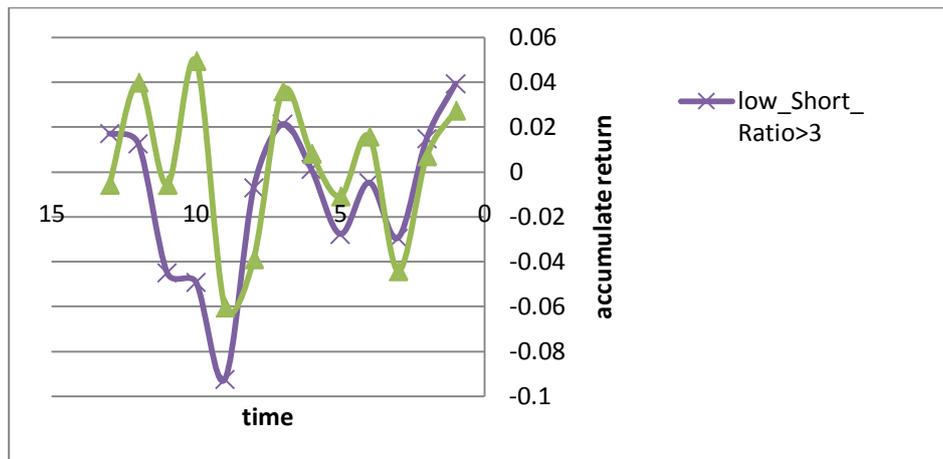
**Table 3: Correlations between Cumulative Abnormal Returns and Short Ratios by Short Ratio Groups.**

<b>Group</b>	Less than 3	Between 3-5	Greater than 5
<b>Correlations</b>	0.08 (0.29)	<b>-0.39</b> <b>(0.04)</b>	<b>-0.37</b> <b>(0.03)</b>
<b>N</b>	50	19	23

Table 3 demonstrates a significant negative correlation between abnormal returns and short ratios within the two groups that contained a relatively high short ratio (3 and above). This important finding means that the highest abnormal return will be achieved if the investor picks stocks with a relatively low short ratio within the group of relatively high short ratios. Since we reported earlier that small firms are traded with a higher short ratio than big firms, we expect

that the medium size group of firms (group 3, those with a market capitalization of \$12.37 B) will be the most attractive group of stocks. In order to validate this finding, we ran another simulation test. Every week, we constructed a portfolio that consisted of the 10 stocks with the lowest short ratio above the benchmark of 3 and compared their cumulative returns with those of the stocks on the Nasdaq100 (Graph 4).

**Graph 4: Cumulative Returns of Lowest Short Ratio Stocks within the Group of Stocks with a Short Ratio Greater Than 3, and the Nasdaq100.**



Graph 4 shows that the portfolio that included stocks with the lowest short ratios within the group of stocks with a short ratio greater than 3 outperformed the Nasdaq100. From May to July 2010, the former gained 0.019 compared to the -0.01 return of the Nasdaq100 over the same period.

**5. Summary and conclusions:**

In this study we examined the relationship between short ratios and abnormal returns on the Nasdaq100 Index between May and July 2010. Our goal was to investigate whether short ratios can predict short-term abnormal returns and to examine to

what extent short ratios of 3 and 5 can serve as bear and bull market predictors. Our results showed that in general short ratios are poor predictors of abnormal returns. However, in a relatively small number of Nasdaq100 firms with an average market capitalization of \$4.8B, there was a significant negative correlation between short ratios and abnormal returns. A simulation test in which we created a portfolio that consisted of the 10 stocks that each week were trading with the lowest short ratio within the group of relatively small market capitalization firms outperformed the Nasdaq100 Index during the three months of the study. When we examined the well known benchmarks of 3 and 5 for bear and bull markets, we found a significant negative relationship between abnormal returns and short ratios for firms with a short ratio greater than 3. The simulation test also showed that the portfolio that contained stocks with relatively low short ratios, but greater than 3, outperformed the Nasdaq100 Index. These results cast doubt on some analysts' hypothesis that a short ratio greater than 5 suggests a bull market because it signals a large potential demand for stock. Indeed, the results support those analysts who believe that

a high short ratio implies the opposite.

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