Short seller report and stock performance Empirical evidence from US-listed Chinese firms

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Abstract. In recent years, there have been a number of Chinese companies listing in the US market. At the same time, many of them delist from the US market. An important reason behind this is the issue of financial fraud. Most of these cases are due to short seller reports by activist short sellers. After short selling, financial and auditing problems are revealed, causing the share prices of these companies to collapse. This has raised concerns among US regulators about the quality of Chinese companies' auditing and prompted joint supervision by Chinese and US regulators. This paper uses Chinese companies listed in the US as samples to study the long and short term fluctuations of these companies' stock prices before and after the short seller reports were issued. After the short seller reports are released, the results show that the stock price can fall significantly in the short term, with the average CAR reaching 10%. Long term share prices are less affected, with 45% of short seller reports associating with negative price changes. This paper also examines the factors that influence the market's reaction to short seller reports. Companies that choose the accounting firms from the Big 4 see smaller share price declines in the short run compared to those that do not. In addition, small companies are more likely to recover from such negative events in the long run than large ones. The study of short selling reports is important. Some limitations and restrictions make it difficult for US regulators to fully monitor all Chinese companies. Therefore, individual investors can only obtain information through these short-selling reports, and then change their investment decisions to protect their interests.

Keywords: component; short seller report; stock return; US-listed Chinese companies

1. Introduction

In recent years, shorting has been a hot topic. A company could be delisted or hurt future stock returns because of short selling. Therefore, it is necessary to study short selling. At the same time, there has been a great deal of literature on short selling. Short sellers make profits by doing early research against a target stock, using a 'buying low and selling high' strategy. By reviewing the literature, Jiang, Habib, and Hasan summarized the impact of short selling on financial reporting and auditing, as well as the role of short sellers in information gathering and dissemination [1]. Drake, Myers, Myers, and Stuart believed that the interest of short selling played a significant role in incorporating future earnings information into the current stock price [2]. At the same time, short selling could facilitate the integration of public information into stock prices and helped the market correct excessive stock valuations and deviations from fundamental values [3, 4]. Issuing short selling reports is an important channel for short sellers to disseminate information. Since 2020, short sellers have reported a surge in short-selling of Chinese companies, especially those listed in the US. Because of frequent accounting fraud cases, the *Sec*urities and Exchange Commission (SEC) and the Public Company Accounting Oversight Board (PCAOB) are concerned about the audit quality of Chinese listed companies. However, because of different laws and provisions in these two countries, the US regulators cannot obtain work papers from Chinese auditors. Combined with language issues and time and budget constraints, US regulators can't review the audit quality of Chinese companies. In this way, US regulators cannot provide effective information for investors and cannot guarantee their profits. Therefore, in the context of Sino-US joint supervision issues, this paper studies the effect of short selling reports of Chinese companies listed in the US.

This paper investigates how short seller reports affect the stock performance of US-listed Chinese firms in both the short term and the long term. In the short run, publishing short selling does affect a

company's stock price. This impact is significant since the mean cumulative abnormal return (CAR) is -10%. Besides, reports focused on the same company at a different time have different effects on share prices. The first report released for each company had an even greater impact, with an average CAR achieved -18.5%. In the long run, most of the companies that received the reports would see lower yield of their share after three months of holding, even though market yields remain positive. The overall yields have been more affected by short selling.

The following is structured as follows: the second part provides some background information and the existing literature. The third part explains the samples and research methods. The next part gives the empirical results, and the last part summarizes the main findings and limitations.

2. Background and Prior Research

Financial fraud has always been a persistent disease in the capital. Based on the analysis of firms involving financial fraud, it can be concluded that the fraud mainly stems from weak internal control. According to Donelson, Ege, and McInnis, fraud was significant associated with internal controls that were too weak [5]. Doyle, Ge, and McVay studied the factors of weak internal control. They found that companies that were more likely to have internal control defects were less profitable, small, and in a period of rapid growth or were in the process of restructuring [6]. Ghosh and Lee also pointed out that companies with weak internal control disclosure were more likely to have internal control problems in the year before disclosure than companies without such problems and these companies tended to have lower quality financial reports before disclosure [7]. Johnson, Khurana, and Reynolds took the tenure of accounting firms as the research object. They showed that shorter tenure (2-3 years) of accounting firms was related to lower financial reports quality [8].

2.1 Short Sellers' Attack

2.1.1 The First Round of Short Sellers' Attack on US-listed Chinese Firms

Chinese companies account for a large proportion of foreign companies listed in the US. The number of Chinese companies listing in the US has continued to grow over the past decade. In 2010 alone, 43 Chinese companies were listed in the US, according to public data. As of October 2, 2020, 217 Chinese companies were listed on the US market. However, in March 2010, 16 Chinese companies faced a class-action lawsuit over audit quality issues, which brought Chinese companies into the spotlight in the media and from short sellers. This was the beginning of the first round of short sellers' attacks on Chinese firms listed in the US. RINO International Corp. (RINO) designs and manufactures environmental equipment as its main business. In November 2010, Muddy Waters Research published a report alleging RINO of financial fraud, which eventually led to the company's delisting. As a result, audit firms that provide audit services to Chinese companies had caught the attention of short sellers. In 2011, 28 companies were delisted, and 46 were suspended from trading for long periods or warned to delist. One of those firms is Longtop Financial Technologies (LFT). LFT is a software company based in China, registered in the Cayman Islands, and with Hong Kong and Xiamen offices. On April 26, 2011, Citron Research accused it of financial fraud. The company's shares fell 12.92 percent on the day of the allegations. And it was suspended from trading on the New York Stock Exchange (NYSE) for allegedly inflating profits and disclosing false financial information.

2.1.2 The Second Round of Short Sellers' Attack on US-listed Chinese Firms

After the LFT incident in 2011, the US auditors from mainland China and Hong Kong be subject to PCAOB's oversight, including access to their working papers and on-site inspections. On May 7, 2013, the China Securities Regulatory Commission (CSRC) and the Ministry of Finance signed a memorandum of cooperation with the PCAOB to officially carry out cross-border law enforcement cooperation. In 2016, the two sides conducted a pilot investigation of a Chinese accounting firm registered with the PCAOB. The Chinese team assisted the PCAOB in finding an effective inspection

method. On December 7, 2018, the SEC and the PCAOB issued a statement listing 224 listed companies and their auditors at audit risk, including Alibaba and JD.com. On September 30, 2019, the PCAOB released a list of companies that refused to be inspected, including 137 from the Chinese mainland and 93 from Hong Kong. So far, the cross-border regulatory cooperation between China and the US has not achieved the desired results. On January 31, 2020, Muddy Waters issued a brief report accusing Luckin Coffee of fraud. After Luckin, six more companies have been shorted. This is the second round attack by short sellers on US-listed Chinese companies. The Luckin incident has alarmed the PCAOB. It then stated on April 21 warning investors to be cautious about investing in Chinese stocks because of limited access to working papers. A month later, the US Senate passed the "Holding Foreign Companies Accountable Act", which said foreign companies would be banned from trading in the US if they failed to meet the PCAOB's requirements for three consecutive years. In a report released on August 6, the US Treasury proposed raising the bar for public companies in areas where the PCAOB cannot conduct inspections. Companies that were already public must meet the requirements by 2022. On August 8, the CSRC said China has cooperated with the US on joint inspection programs many times since 2019. Information such as audit working papers should be exchanged through regulatory cooperation channels, which is in line with international practice. On August 10, Steven Mnuchin, the US Treasury Secretary, said that companies from China and other countries that do not comply with accounting standards would be delisted from US exchanges by the end of 2021 to ensure that companies around the world use the same standards. US-listed Chinese companies have those similar audit problems which reduce the trust of US regulators in domestic auditors.

2.2 Reasons and Effects of Short Selling

2.2.1 The intervention of SEC and PCAOB

After financial and audit problems are reported at Chinese companies, SEC and the PCAOB have raised concerns about the quality of auditing by Chinese companies. However, because of some limitations such as extra travel costs to China and differences in accounting principles and legal provisions between these two countries, regulators in the US cannot fully inspect these foreign companies. Previous studies have provided evidence that PCAOB audits can have a positive impact on audit quality. Lamoreaux found that after the intervention of PCAOB, the audit quality improved for both high and low inspection risk clients [9]. This was similar to the finding of Fung, Raman, and Zhu that the PCAOB's initial inspection of foreign auditors had a beneficial effect on the audit quality of the auditor's non-US listed clients [10]. In addition, an inspection of PCAOB can motivate audit firms to correct internal control deficiencies [11]. Although the audit cost was high, the quality is eventually improved after inspection [11].

2.2.2 Summary of Reasons and Effects

A range of literature has found that companies with poor financial reporting quality tend to be attractive to short sellers. Karpoff and Lou pointed that the quality of financial reporting could be recognized by short sellers [12]. They were interested in firms that focused more on real earnings management activities, which would overvalue the share prices [13]. Additionally, companies with less comparative accounting information tended to attract short sellers [14]. Short-sellers' information dissemination can affect the equity market. Short selling could accelerate the integration of public information into stock prices and helped correct short term deviations in the market from fundamental value and overvaluation of stocks [3, 4]. Boehmer and Wu found that short selling flow did make prices more efficient [15].

3. Data Collection and Research Method

3.1 Data Collection

This paper aims to investigate the impact of short seller reports. To collect the sample data, the following procedures are used. First, Chinese companies listed in the US that shorted from 2010 to 2020 are identified. Since a few companies were shorted by investors shortly after they went public, there are not enough observations to estimate the market model when calculating short term abnormal returns. Therefore, they are excluded from the sample. The initial sample consists of 30 US-listed companies. Next, short seller reports are download from these investors' websites. Finally, 40 reports from 10 short sellers are collected, and these reports involve 25 US-listed Chinese companies. The sample covers a period from June 2010 to April 2020.

3.2 Research Method

This paper aims to study the impact of a short selling report on company stock prices before and after release. This impact is divided into short term and long term effects. For short term impact, the event study method is used to study the movements of stock prices. To examine the effect in the long run, buy and holding return of stock *i* is calculated as follows:

$$BAHR_i = \frac{R_{i,n} - R_{i,t}}{R_{i,t}} \quad (1)$$

In this model, *n* represents the day that one quarter after the day of short selling. Finally, long term return is obtained by:

$$LTR_i = BAHR_i - BAHR_m \quad (2)$$

4. Empirical Results

Table I displays the summary statistics for both raw returns and the CAR in short term. Raw return is the sum of stock returns in three days, centered on the day that the company received a short seller report. In Panel A, all 40 short seller reports are included to test the overall effect. On average, the three-day raw return is negative, reaching -0.063, and is significant at a 5% level. This means short sellers publishing reports made a general decline in stock prices. In terms of CAR, the range of return is 0.977. CAR strips out market-driven factors in share prices and earnings. Three days' CAR indicates a general decline in stock prices, with an average drop of 10%. This is significant at the 1% level and shows the immediate impact on share prices. In Panel B, other reports published within a short period on the same company were excluded, retaining only the first report on one company. Because the first report usually refers to main allegations and investment suggestion – strong sell, while the subsequent reports usually add new evidence or explanations to the previous report. In addition, negative events such as auditor resignations and class-action lawsuits can impact the later stock price. The mean for raw returns is -0.133 and significant at a 1% level. For CAR, the average return is -0.185, which is also significant at 1% level. The upward trend of the market hedges the impact of publishing short seller reports. Thus CAR has an even negative mean than actual return. The means in Panel B both have a small value than in Panel A. This is probably because investors are cautious and irrational when short sellers issued the first report. After subsequent reports are published, they have more idea about the firm and would be more rational about short selling later.

Table 1. Impact of short seller report in short term

	min	median	max	mean	No. of reports
		Panel A. All reports			
Raw return	-0.633	-0.035	0.392	-0.063**	40
CAR	-0.652	-0.043	0.325	-0.100***	40
		Panel B. All first report			
Raw return	-0.633	-0.067	0.259	-0.133***	25
CAR	-0.652	-0.126	0.252	-0.185***	25

a. In all these two panels, the market model was used to present normal returns and S&P 500 index to represent market return. ***p<0.01, **p<0.05, *p<0.1.

The results obtained from the preliminary analysis of long term BAHR can be seen in Table II. All the BAHR are the actual returns of the stock by holding for one quarter, from the day that company received the short selling report. In the long run, both stocks' BAHR and S&P 500 index have a positive return. For individual stock, the average actual return in three months is 0.033. However, this is not significant, which means there is no evidence that short seller reports have a long-term effect on firms' stock performance. After publishing all the 40 short seller reports, only 18 reports, or 45% of reports, have a negative effect on corresponding stock prices. The number of reports that move stock prices does not reach 50%, suggesting that reports do not fully affect long-term returns. For the market, it has a weaker reaction. The S&P 500 has an average long term return of 4%, and it is significant at a 1% level. The long term market returns are negative over the periods that 25% reports published. This 25% of negative returns may not be because of short selling but because of the overall bad market. Short selling has a greater impact on individual stocks, but the impact on the market is not obvious. To evaluate the LTR, on average, the index outperformed individual stocks by 0.007. The market index does better than individual stock when facing negative shock. This is because the market can resist and diversify risk. Therefore, the market has a more positive return in the long run and is more robust than an individual stock.

Table 2. Impact of short seller report in long term

	min	median	max	mean	negative	No. of reports
Stock BAHR	-0.818	0.028	0.852	0.033	18(45%)	40
S&P 500 BAHR	-0.164	0.047	0.183	0.040***	10(25%)	40
LTR	-0.903	0.015	0.790	-0.007	18(45%)	40

a. ***p<0.01, **p<0.05, *p<0.1.

Table III indicates factors that influence the market response to short seller reports. For the sake of depth and simplicity of research, two factors are chosen: accounting firms selection and firm size. The accounting firms of sample companies come from CSMAR Database and the market value of each company is collected from Wind and Bloomberg. For simplicity, the median market value is used as a benchmark to determine the size of these firms. Results from Table 8 are quite interesting. To illustrate, Panel A is used as an example. The CAR of companies that choose accounting firms from Big 4 have a minimum of -0.646 and a maximum of 0.252. The long term BAHR have a minimum of -0.419 and a maximum of 0.701. Generally, in the short run, companies that choose accounting firms from the Big 4 have negative returns, and in the long run, they have positive returns. The means reach -0.081 and 0.031 respectively. From Panel A and Panel B, firms choosing accounting firms from Big 4 have nearly the same long term BAHR with firms choosing non-Big 4 accounting firms, with 0.031 and 0.037 respectively. By contrast, in the short run, firms choosing accounting firms of Big 4 experience a mean CAR of -0.081, which is higher than that of firms choosing Non-Big 4 at -0.116. Interestingly, in Panel C and Panel D, the average CAR of big companies is -0.099, which is not much different from the CAR of small companies at -0.092. However, in the long run, big companies' BAHR is 0.024 while that for small companies is 0.042,

leaving the range to be 0.018. Overall, these results indicate that after short selling, in the short run, stocks of firms choosing Big 4 perform better than firms choosing non-Big 4, while in the long run, small companies tend to recover quickly from the negative shock. Additionally, the choice of accounting firms has a bigger effect on the stock price.

Table 3. Factors influencing market reaction to short seller reports

	min	median	mean	max	No. of reports
Panel A. Accounting Firms from Big 4					
CAR	-0.646	-0.031	-0.081**	0.252	24
Long term BAHR	-0.419	0.019	0.031	0.701	24
Panel B. Accounting Firms from Non-Big 4					
CAR	-0.652	-0.055	-0.116*	0.325	16
Long term BAHR	-0.818	0.097	0.037	0.852	16
Panel C. Big Company					
CAR	-0.646	-0.031	-0.099**	0.252	20
Long term BAHR	-0.419	-0.041	0.024	0.852	20
Panel D. Small Company					
CAR	-0.652	-0.055	-0.092*	0.325	20
Long term BAHR	-0.818	0.098	0.042	0.701	20

a. ***p<0.01, **p<0.05, *p<0.1.

5. Conclusion

This research focuses on the stock performance after short seller reports were published. To examine this question, by using a sample of 25 Chinese companies listed in the US and 40 short seller reports released by short sellers, stock price fluctuations trends before and after 40 short selling reports were published are calculated. Overall, the findings show that short selling has a negative effect on stock prices in the short and long terms. In the short term, on average, CAR reaches to -10% within 3 days after reports were published. If we focus on only the first report, the CAR value is -18.5%, which indicates a significant impact on the stock price within three days. Over the long term, most Chinese companies are expected to post positive returns after a quarter of the short selling. This research also compares two factors that influence the market's response to shorting - accounting firm selection and firm size. The results show that the choice of accounting firm affects the short-term return, while the firm's size affects the long-term return of the stock. Furthermore, the choice of audit firm matters more than the size of the firm.

Although findings in this study suggest that firms' stock performance would be negatively affected by short selling, this study focuses on short seller reports lacking authenticity. In other words, short sellers investigate and publish these reports themselves, leaving the source of information in the reports uncertain. In addition, shorted companies are selected only based on public information such as news on the Internet. Therefore the selection of sample companies would be biased and other companies may not be included in the sample. Future research can be combined with the company's financial statements and can focus on companies listed in other countries.

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