

**The Chinese University of Hong Kong
(Shenzhen)**

**School of Management and Economics
FIN3080 Investment Analysis and Portfolio
Management
(Semester 2, 2019/20)**

**Empirical Test of the Efficient Market Hypothesis
(semi-strong form) in China Stock Market**

罗琦琦

118020046

I . Theory background of the efficient market hypothesis (semi-strong form)

The semi-strong efficient market theory holds that the prices of securities not only fully reflect all historical information, but also all publicly published information. All kinds of information once released, stock prices adjust quickly to its level, making any predictions about the future of the stock price movements based on the public information lose significance. Therefore, investors cannot use analysis of all publicly available information (mainly refers to the analysis on the basis of stock price changes) to consistently get excess profits.

II . Methodology

Event-study analysis was taken to test the semi-strong form efficient market hypothesis. In this paper, we studied whether the market reacted to the new information and adjusted the stock prices immediately when financial reports were released by public companies quarterly.

First, we divided the whole A-shares into 10 groups based on cumulative abnormal return increasing from five trading days before the announcement (marked -5) to one trading day after the announcement (marked 1). Because there may have been information leaked began to affect the market and the general announcement is announced at the end of the day after the trading, we chose (-5,1) trading days as group selection period. The CAR within these seven days indicates the financial report is a good signal or a bad signal.

Second, we calculated the Average Cumulative Abnormal Return (ACAR) of 10 groups over the next 5, 10, 15, 20 trading days from actual disclosure time, respectively. If the ACARs of 10 groups are indifferent, that meant the influence of announcements are taken away immediately and the semi-strong form efficient market hypothesis is valid in Chinese stock market.

It should be noted that different companies release quarterly reports at different times, so it is necessary to adjust the impact of different market gains on the results. In this paper, we directly subtracted the return of individual stocks from the return of the market on that day and we used the China securities 800 index return rate as the market return rate.

III . Sample and data

The sample was all stocks of A-shares (except those who did not release the quarterly financial reports 12 times within 3 years) from January 1, 2016 to December 31, 2018. All the data of A-shares and China securities 800 index in the test were downloaded from CSMAR and the data of actual disclosure time of financial reports were downloaded from Chinese Research Data Services(CNRDS) Platform.

i. The cumulative abnormal return of stock i over (a,b) trading days

$$CAR_i = \frac{P_{i,t+b} - P_{i,t+a}}{P_{i,t+a}} - \frac{P_{m,t+b} - P_{m,t+a}}{P_{m,t+a}}$$

, where $P_{i,t+b}$ is the daily closing price of stock i on the b trading day after the announcement day t, $P_{i,t+a}$ is the daily closing price of stock i on the a trading day after the announcement day t, $P_{m,t+b}$ is the last index in the daily trade of China securities 800 index on the b trading day after the announcement day t

ii. The average cumulative abnormal return of group j

$$ACAR_j = \frac{1}{n} \sum CAR_i, \text{ for } i \text{ in group } j$$

, where n is the number of stocks in group j.

iii. The disclosure periods

Different companies may release the same quarterly reports at different quarters. For example, in terms of the financial report of the first quarter in 2016, company A may release in April, 2016, company B may release in July, 2016. Therefore, we considered the order of disclosure as disclosure periods. For example, we marked the first disclosure (actual) in 2016 as disclosure period 1; thus, there were 12 disclosure periods.

iv. The sum of the sample variance of ACAR among 10 groups in each disclosure period over (a,b) trading days

$$S_{(a,b)} = \sum_{k=1}^{12} Var(ACAR^k)$$

, where $ACAR^k$ is a vector of $ACAR_j$, $j = 1, 2, \dots, 10$, in disclosure period k over (a,b) trading days.

v. The sum of the sample variance of ACAR between group 1 and group 10 in each disclosure period over (a,b) trading days.

$$S_{(a,b)}^{1,10} = \sum_{k=1}^{12} Var(ACAR^{k'})$$

, where $ACAR^{k'}$ is a vector of $ACAR_j$, $j = 1, 10$, in disclosure period k over (a,b) trading days.

IV . Analysis

In the first step, we divided the sample into 10 groups based on CAR_i . Then, we labeled the stocks in the top ten percent ranking from small to large as group 1, which means those stocks with smallest CAR_i were divided into group 1. The Average Cumulative Abnormal Return (ACAR) of 10 groups over the next 5, 10, 15, 20 trading days from actual disclosure time were shown in Figure 1, Figure 2, Figure 3, Figure 4, respectively.

Figure 1 Average Cumulative Abnormal Return (5 trading days) of 10 Groups

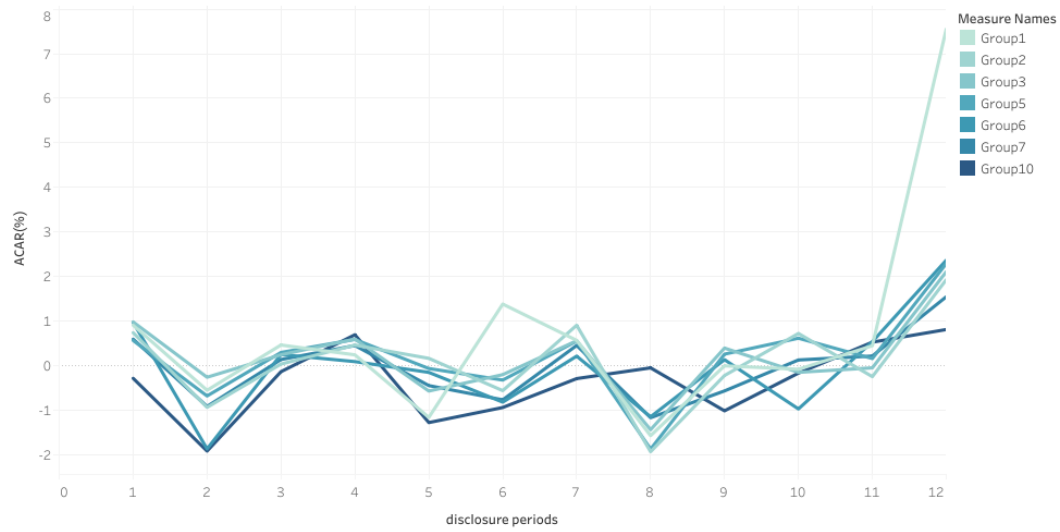


Figure 2 Average Cumulative Abnormal Return (10 trading days) of 10 Groups

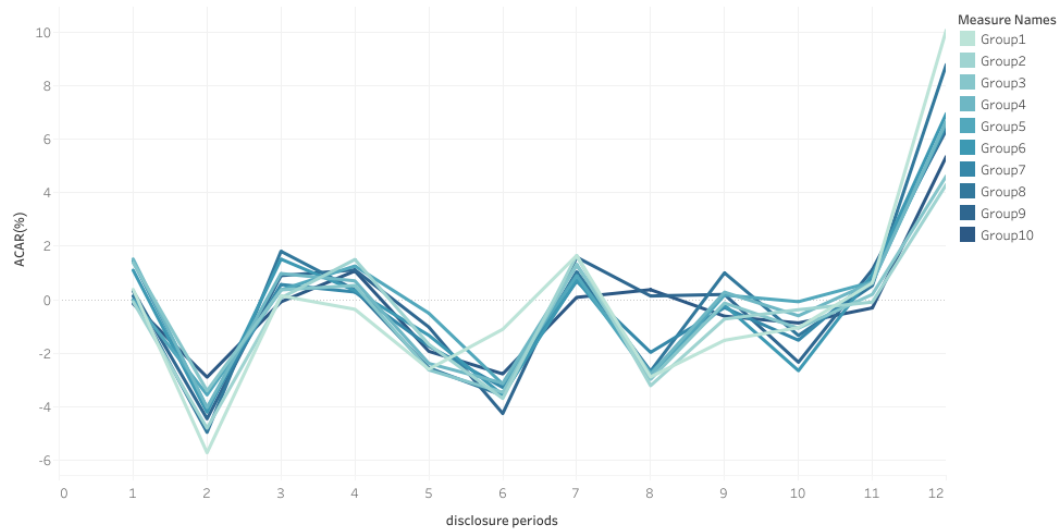


Figure 3 Average Cumulative Abnormal Return (15 trading days) of 10 Groups

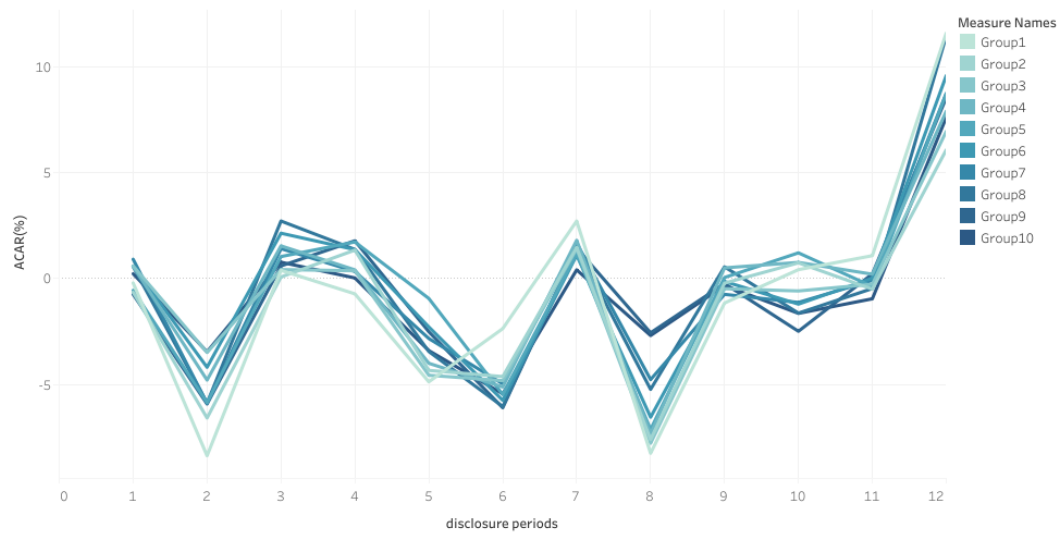
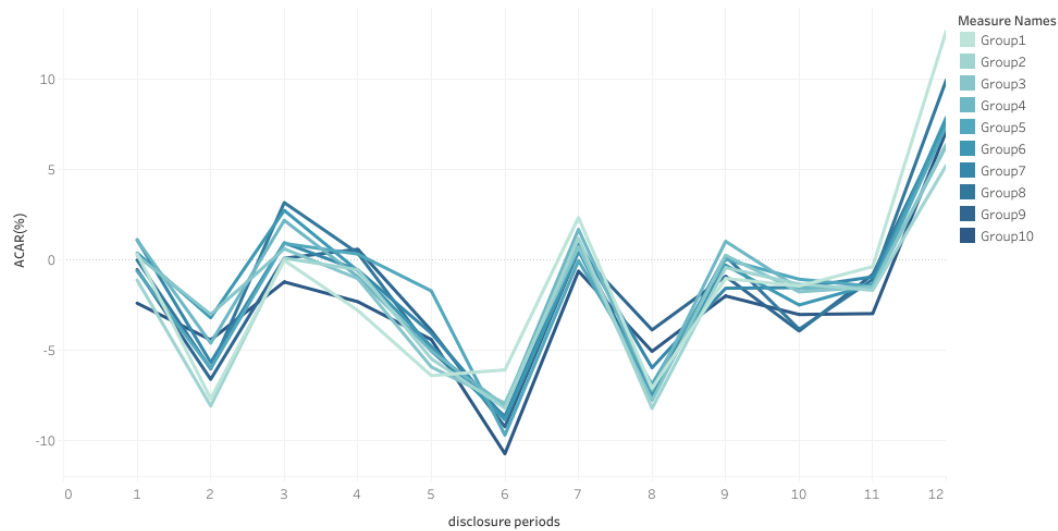


Figure 4 Average Cumulative Abnormal Return (20 trading days) of 10 Groups



As Figure 5-8 showed that the times of $ACAR_1 > ACAR_{10}$ are 8, 8, 5, 6, respectively, which means the probability of gaining higher ACAR for those stocks releasing bad financial report is larger than those stocks releasing good financial report in the next approximately 10 days from actual disclosure time. But due to the overreaction of the market, some investors thought those stocks releasing bad financial report were undervalued, the ACAR went up. As time went by, the effectiveness of financial reports was different under different market background.

Figure 5 Average Cumulative Abnormal Return (5 trading days) of Group1 and Group10

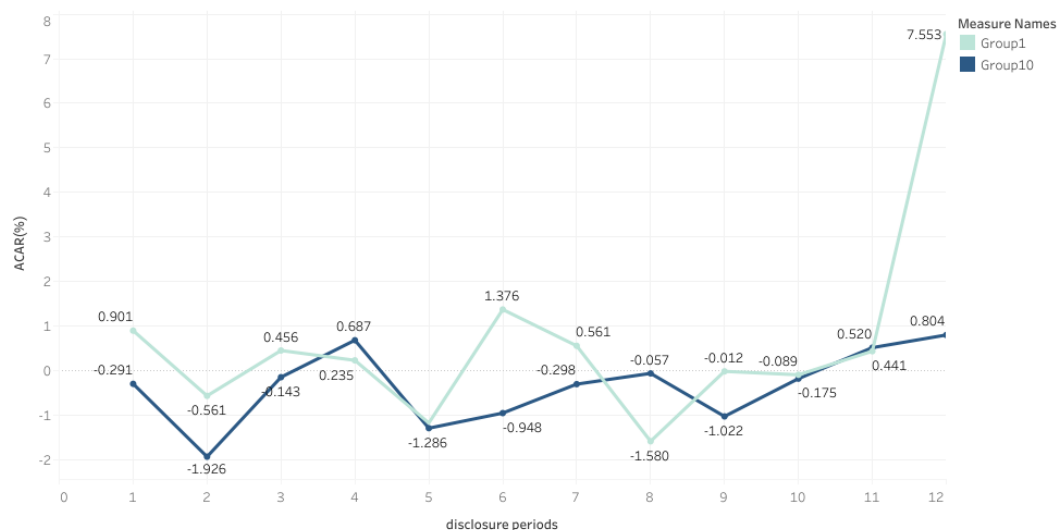


Figure 6 Average Cumulative Abnormal Return (10 trading days) of Group1 and Group10

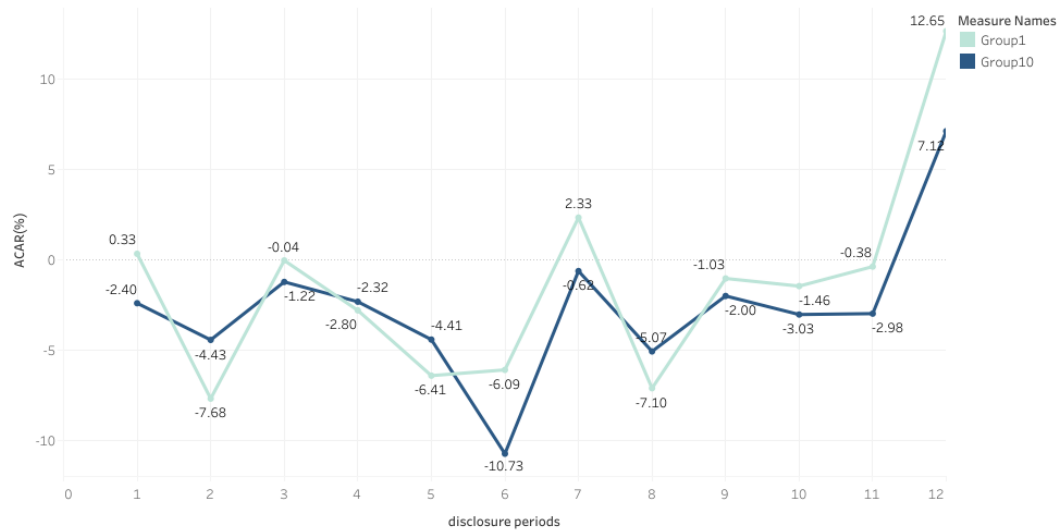


Figure 7 Average Cumulative Abnormal Return (15 trading days) of Group1 and Group10

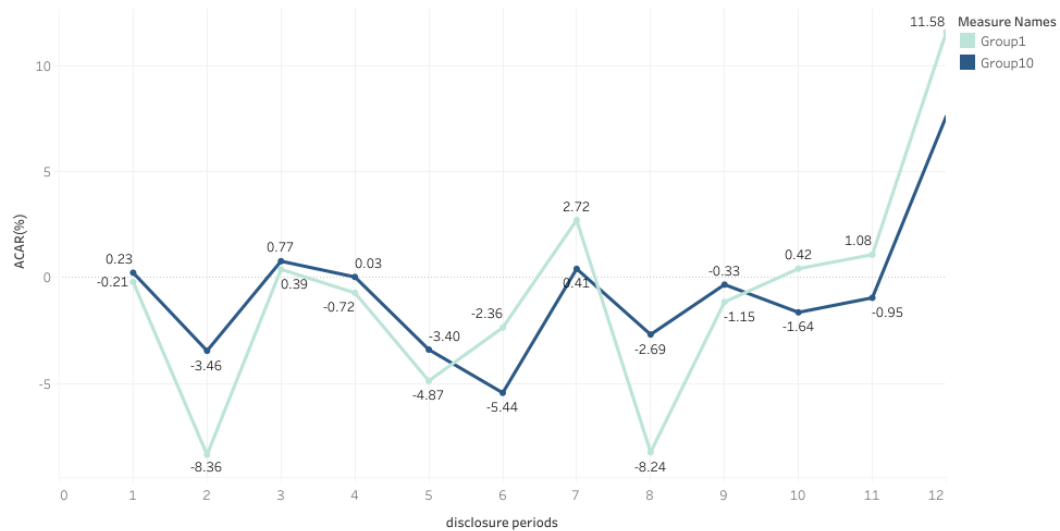
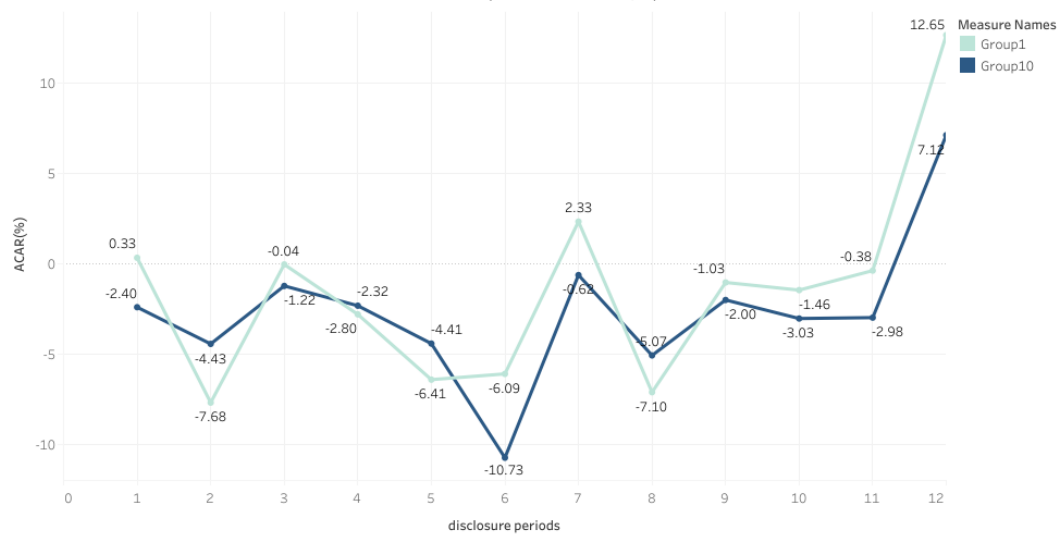


Figure 8 Average Cumulative Abnormal Return (20 trading days) of Group1 and Group10



From Table 1, we can see the differences of ACAR among 10 groups and between group 1 and group 10 are both becoming larger over longer trading days from actual disclosure time within 20 days. That shows the Chinese stock market had the hysteresis in the processing and reaction of information and the price was not adjusted in place immediately.

	(2,6)	(2,11)	(2,16)	(2,21)
$S_{(a,b)}$	6.50	9.47	16.63	19.69
$S_{(a,b)}^{1,10}$	0.47	1.22	1.97	2.25

Table 1 The Sum of the Sample Variance of ACAR among 10 groups and between group 1 and group 10 in each disclosure period over the next 5 days, 10 days, 15 days, 20 days from actual disclosure time

V . Conclusion

In this study, we attempted to test whether the investor react the new information immediately. We can conclude that the semi-strong form hypothesis is not valid in Chinese stock market. There exists reaction hysteresis for new information in Chinese stock market, and investors can use analysis of all publicly available information to get excess profits.