以媒體效果探討股市過度反應現象

The Media Effect on Stock Market Overreaction

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摘要：近年來行為財務學已發現不論股價行為是過度反應或反應不足，皆隱含投資人根據市場中相關資訊來形成投資決策時所呈現非理性行為。本文希望除了驗證過度反應之現象外，亦觀察媒體效果是否有形成或助長過度反應的發生。在加入媒體效果後發現當平均新聞則數、曝光強度愈高，則反轉的時間愈早且反轉的幅度愈大。當多空強度為轉弱(壞消息)時，其反轉的時間會比多空強度為強(好消息)時早，且幅度更大。最後將規模效果考慮進去後會發現，小公司的報酬反轉時間會比大公司慢，但隨著持有期愈長，其反轉幅度會漸漸超越大公司。過去有許多文獻使用過度反應的現象來形成反向投資策略，而本文對於過去解釋投資策略獲利的原因，增加一個新的解釋方向。
關鍵詞：過度反應；媒體效果；股票市場；市場效率

Abstracts: The recent literature of behavioral finance has introduced that the overreaction or underreaction of share price movements can be explained by investors' irrational investment decisions. Besides re-examining the overreaction hypothesis, this study further investigates whether media effect can cause or enhance market overreaction. We observe that the pace and magnitude of stock price mean reversion are positively associated with the average number of press releases and the magnitude of press exposure. Both the pace and magnitude of share price mean reversion are higher in the declining market (i.e., bad news) than in the advancing market (i.e., good news). We also find that the pace of share price mean reversion is slower for small firms than for large firms. However, the

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magnitude of share price mean reversion for small firms, exceeds that for large firms as holding period extends. Past studies apply overreaction phenomenon to develop contrarian investment strategies. We contribute to the literature by incorporating the media effect as an explanation for contrarian investment strategies.

Keywords: Overreaction; Media effect; Stock market; Market efficiency

1. Introduction

Information is considered as a crucial tool for the enterprise to establish the decision-making framework, and the information quality is determined by the information effectiveness and timeliness in the contemporary circumstance. The efficient market hypothesis (EMH) introduced by Fama (1970) suggests that the markets will disseminate the information efficiently and the stock prices will reflect all relevant information even though the stock prices deviate from the intrinsic value. Overtime, the investors are able to decode the information precisely by means of learning effect and the stock prices will eventually converge to their intrinsic value. Fama (1970) considers it is impossible for investors to gain abnormal returns from the public information, but normal profits. Consequently, the investors cannot consistently gain abnormal returns by adopting any singular investment strategy, proposing the no-arbitrage condition for all the investment strategies. Nonetheless, the claim of EMH is called into questions by a numerous studies and propositions: for instance, the abnormal phenomenon suggested by capital asset pricing model (CAPM), the conflicts to EMH such as overconfidence, underreaction, overreaction, size effect, and so on. According to the prospect theory of Kahneman and Tversky (1979), given uncertainty, the investors engaged in making a decision are not rational as those in the traditional financial theoretical hypothesis. On contrary, the investors are either unable to collect all information, which result in cognitive bias, or they simply follow empirical experiences and intuition as the basis of decision making, which may cause either overreaction or underreaction on their investment behavior.

The abnormal phenomenon, including overreaction, in the market is observed by numerous empirical studies. For example, the current winner would be the loser in the future, and current loser would be the future winner. Overreaction describes that people's actions for certain events or time to react are more intense than normal, resulting in cognitive bias or excess rises or falls in stock prices. The earliest finding of overreaction is presented by Keynes (1964) stating that the investors overly buy or sell can cause the fluctuations in stock prices. According to Kahneman and Tversky (1982), people are terrified at unexpected events as well as overreacted from the angle of experimental psychology. De Bondt and Thaler (1985) use the NYSE samples and compile

CRSP monthly returns data between 1926~1982, discovering (a) the returns appear asymmetry variation and the returns on the reverse of the losers' portfolio was greater than the winners' portfolio, (b) most of the abnormal returns occur in January, (c) excess reaction occurs mostly in the second and third year of the study period, and (d) the longer the portfolio formation, the greater the reverse of return subsequent to the portfolio formulated, which verifies the overreaction hypothesis. Then, there is still a plenty of literature providing a more comprehensive observation. For example, Zarowin (1990) claims that overreaction is caused by size effect. Clare and Thomas (1995) discover that overreaction may be from size effect by studying the stock market of the Great Britain. Chopra, Lakonishok and Ritter (1992) adopt multiple regression analysis to analyze overreaction, controlling for size effect. They confirm the existence of overreaction independent from risk variation and size effect. However, Albert and Henderson (1995) indicate the bias generated under controlling the firm size.

A number of researches investigate whether overreaction is present in the stock markets, and many of them support the survival of overreaction. Several later studies evaluate overreaction with other events, such as examining the behavioral bias by exploring the prediction data on brokerage surplus in Taiwan, and the empirical result accepts the overreaction existence. Moreover, some literature explore whether the stock markets overreact in financial crisis, and the results support overreaction in the short term rather than in the long term. Moreover, the investors with sufficient confidence in the bull market enable stock price reverse immediately subsequent to the board of directors meeting, and the time of which is shorter than that in the research of De Bondt and Thaler (1985). The president election in 2008 is regarded as an important research object to account for reaction bias for investors in stock market, which is anchoring effect on behavioral finance. The empirical results show the trend of overreaction in which investors anchor at the initial expectation easily and then cause an under-correction. For the samples whose stock prices are higher than expected, however, there is an overreaction. In general, most literature hold more supportive opinions on the overreaction phenomenon in Taiwan, although some studies disagree the findings of De Bondt and Thaler (1985).

Recently, the investors executing the investment decisions based on the related information in the markets appear irrational behavior no matter the stock prices are overreacting or underreacting. As the stock market in Taiwan is a shallow dish market with high participation of the individual investors, the market size is small, insufficiently stable, highly frequent trading by the investor's habit resulting in erratic fluctuation in stock prices. The channels of financial press and reports are rather countlessly as well as the various media information prospers. Huberman and Regev (2001) discover that the article of New York Times announcing the remedy of cancer medicine draws up the investor's attention as

well as the company stock price since the company researches and develops the medicine of curing the cancer enabling the stock price rise greatly over than 60%. The findings of some domestic literature on this study indicate that more than 60% of the stock investors deem the considerable relationship between the frequency of information reflected in media reporting and company stock prices. By means of adopting the theory of behavioral finance as the foundation, exploring whether the factors of investor's psychology establish irrational investing decision subsequent to the news the media announces and react further on stock performance. There are a few literatures exploring the factor of media which influences the performance in stock market in the past while the performance is as crucial factor for overreaction in stock market. There seems to be no research on the subject of media effect on overreaction, and the research and observation of this study seem to be able to expand the explanation of overreaction.

Taking the psychological research of Williams (1956) as an example, people tend to overreact on unpredictable information or major events. The literature shows the investors' reaction to the strengthening information given the hierarchy of psychology. Accordingly, people tend to value recent information excessively while adjusting the belief and ignoring the past information. The stock prices rise sharply due to over-optimism, or the stock prices drop greatly owing to over-pessimism for the future. According to the empirical findings from Cutler, Poterba and Summers (1991), people react inadequately initially to the information appearing at the first time, and then react little by little, which cause underreaction, despite the overreaction for constantly appearing press. As far as psychology is concerned, the repeated information may increase the customer's cognition, memory, and the possibility of purchase. Crowder (1976) discovers that the repeated frequency increases as well as the memory of content and effect with re-identification increased by the frequency of information providing. Belch (1982) describes that the related information memory for customers to the product increases, providing the product information constantly for the media. The literature seemingly accounts for the investor's impression strengthened by the media which is supposed to expand investor's reaction under increasing investor's cognition. The research purpose on this study is to observe whether higher exposure of company press will influence the investor's decision to generate overreaction or underreaction. Moreover, we also examine whether the level of overreaction or underreaction is strengthened by either positive or negative press reporting.

As far as the behavioral finance theory is concerned, the investors increase the memory of content and the effect of re-identification as the message content is increased and strengthened. As a result, it is expected to appear a strengthened reaction from the investors, presenting the obvious behavior with greater revision

afterward if the overreaction has existed originally. According to De Bondt and Thaler (1985), the evidence is supposed to be more obvious in that the winners in the past will be the future losers as well as the losers in the past will be the future winners. After the effect of media is added in this paper, the findings are expected to show that, given the higher volume of press and exposure, the earlier the reverse time and the greater the reverse. As the bull and bear intensity turns weak (bad press), the time of reverse is stronger than bull and bear intensity (good press) and earlier with greater range. For the sake of stable observing, the reverse time of stock returns in small companies is lower than in the big companies, but the range for the small firms will surpass that for the big companies gradually. Taking the overreaction as the structure of reverse investment strategy appeared on plenty of literature, the conclusion of the study is taking a notice of variation as providing to structure portfolios. The paper is organized with five sections. The second section presents the research methodology. The empirical result is provided in the third section, and the conclusion is given in the last part of study.

2. Methodology

2.1 Sample and Data

The listed companies, as the samples, are chosen from July 1st 2004 to December 31st 2009, 1,350 trading days in total, in Taiwan Stock Exchange Corporation in order to evaluate whether investor's behavior is influenced by the effect of daily press. The companies with suspension of trading, stock management, altering transaction and insufficient data are excluded from the samples. Among all 744 sample companies, the proportion of the high-tech industry is the highest, which accounts for 44% of the total samples.

2.2 Variable of Media Effect

The data source for the media effect in the study is from the three build-in press ranking index databases of "CMoney Juristic Person Investment Decision Support System"[2], which gathers press events with related market reports in financial market performance and economic news, excluding other general domestic press events. The study regards the press coverage as one of ranking indicators, using the aggregate press coverage of a company within the same day, and it is for evaluating the relationship between press coverage and overreaction (or underreaction).

The exposure intensity is expected to measure the media effect and to play the role as the number of companies appearing on media affecting overreaction

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[2] The database of "CMoney Juristic Person Investment Decision Support System" has founded the news data since July 1st, 2004.

(or underreaction). Unlike the press coverage, exposure intensity is measured as the number of appearing on the day T relative to the number of appearing on the other days (*T-1~T-30*). The variable is between 0~100 (the exposure intensity is taking percentage as a unit), and the higher the value, the stronger the exposure intensity is. The variable indicates the cumulative probability of being reported under the normal distribution. For example, the exposure intensity of 90% means the rate of press coverage (exposure intensity) is approximately 90% higher than the press coverage in any day over the one month period. The above two variables only stand for the media appearing and coverage, without showing the press content. As a result, the bull and bear intensity was added in the study to explore whether the press content influences the level of overreaction (or underreaction). The variable is designed to be between +100~-100. A positive sign represents the bull market and the negative sign stands for the bear market, which is marked and given by the CMoney on the news perspectives.

2.3 Methodology

The research period of the study is split into two sub-periods, the formation period (the period of forming portfolio) and the holding period (the period after portfolio formation). Overreaction depends on the replacement of the roles between winners and losers through the two sub-periods. Using the stock returns as the portfolio construction basis over the periods of forming portfolios, the top 25% companies form the winner portfolio and the bottom 25% is classified as the loser portfolio. Based on De Bondt and Thaler (1985), we use 5, 10, 15, and 20 days as the formation periods. The winner (loser) portfolio is thus generated by the top (bottom) 25% companies. Prior studies usually employ three sub-periods to study the stock behavior: pre-event estimation period, pre-event period and post-event period (such as Brown, Harlow and Tinic, 1988; Ketcher and Jordan, 1994). The overlapping approach is adopted to intercept the sub-periods with daily translations in order to gain more samples.

According to the overreaction literature, stock return is represented by simple Cumulative Abnormal Returns (CAR) in this paper. Conrad and Kaul (1988) state that this approach implies a portfolio reconstruction at the beginning of each period, which may cause higher transaction costs or bias from bid-ask spread. They hence suggest using the buy-and-hold strategy (BHR) to compute abnormal returns. However, Kothari and Warner (1997) and Barber and Lyon (1997) further show that using BHR to measure long-term abnormal returns cannot help to identify pricing error or model error, leading to unconvincing results.

Hence, this study still adopts CAR by De Bondt and Thaler (1985) to calculate the abnormal return of each portfolio. Following De Bondt and Thaler

(1985) and most previous studies, the cumulative abnormal return for the stock is calculated as

$$CAR_i = \sum_{t=1}^{T} AR_{it} \tag{1}$$

where $AR_{it} = R_{it} - R_{mt}$, as a result, the abnormal return is a market-adjusted excess return, $R_{it} - R_{mt}$, where R_{it} is the stock return on security i in period t and R_{mt} is the equal-weighted average of the daily returns on all stocks listed on the Taiwan market in period t.

3. Empirical Result and Analysis

Firstly, whether the overreaction exists in the stock market of Taiwan over different forming periods is re-examined in this study. Secondly, according to the results from re-examining overreaction, we further test media effect defined on this study. Finally, we investigate whether the overreaction discovered is correlated to firm size.

3.1 Examining the Overreaction

Prior to re-examining the media effect, whether the data tested and verified shows overreaction, the empirical result is presented in Table 1. The result of Table 1 shows that CARs of the winners decline initially but CARs of losers increase, which suggests overreaction in the stock market of Taiwan. In addition, no matter how long the forming period is, apart from the 2nd day following 10 days of forming period, 5 days and the 4th day following 20 days of forming period, the differences of other CARs between losers and winners during the holding period are greater than zero remarkably. Moreover, the returns of losers in the holding period deduct the returns of winners generated from each is documented in Figure 1, showing that the disparity is higher than zero along with the longer forming period and the reverse range increases with holding period. The result suggest that overreaction remarkably exists in the stock market of Taiwan along with the longer forming period and consistent with the work of De Bondt and Thaler (1985).

Table 1
Overreaction of the Stock Market in Taiwan

Panel A	Forming period – 5 days			Panel B	Forming period – 10 days		
Forming period	CAR(W)	CAR(L)	CAR(L-W)	Forming period	CAR(W)	CAR(L)	CAR(L-W)
1	0.14% ***	-0.04% *	-0.18% *	1	0.07%	-0.02% *	-0.09% ***
2	0.08% **	0.02%	-0.06% **	2	0.03% *	0.02% **	-0.01%
3	0.02%	0.09% **	0.07% **	3	0.01% *	0.05% **	0.04% **
4	-0.03%	0.14% **	0.17% ***	4	0.00%	0.05% **	0.05% **
5	-0.10% *	0.18% **	0.28% ***	5	0.01% *	0.01%	0%
10	-0.05% **	-0.03%	0.03% *	10	0.14% *	-0.26% **	-0.40% ***
20	-0.38% ***	-0.32% **	0.06% **	20	-0.48% **	-0.43% ***	-0.05% **
30	-1.31% ***	-0.45% **	0.86% ***	30	-1.75% **	-0.15% ***	1.60% ***
40	-2.59% ***	-0.11% **	2.48% ***	40	-3.33% *	0.45% **	3.78% ***
Panel C	**Forming period – 15 days**			**Panel D**	**Forming period – 20 days**		
Forming period	CAR (W)	CAR(L)	CAR(L-W)	Forming period	CAR(W)	CAR(L)	CAR(L-W)
1	0.08% ***	-0.06% **	-0.14% ***	1	0.07% **	-0.05% **	-0.12% ***
2	0.09% **	-0.05% **	-0.14% **	2	0.05% **	-0.04% **	-0.09% **
3	0.08% *	-0.05% **	-0.13% **	3	0.02% *	-0.03%	-0.05% **
4	0.09% **	-0.07% **	-0.15% **	4	0.05%	-0.03%	-0.03%
5	0.08% **	-0.10% ***	-0.17% **	5	-0.12%	-0.11%	0.01% *
10	0.04%	-0.30% ***	-0.33% ***	10	-0.16% ***	-0.18% ***	-0.03% **
20	-0.78% ***	-0.33% **	0.45% ***	20	-1.32% ***	0.11% ***	1.43% ***
30	-2.49% ***	-0.37% **	2.56% **	30	-3.32% ***	1.36% ***	4.27% ***
40	-4.32% **	1.19% **	5.51% ***	40	-5.24% ***	1.99% ***	7.23% ***

Note: 1. CAR(W) represents CAR in winner portfolios, CAR(L) represents CAR in Loser portfolios, CAR(L-W) represents differences in CAR between the loser and winner portfolios.

2. * indicates 10% level of significance. ** indicates 5% level of significance. *** indicates 1% level of significance.

Figure 1
Trend Chart of Cumulative Abnormal Returns
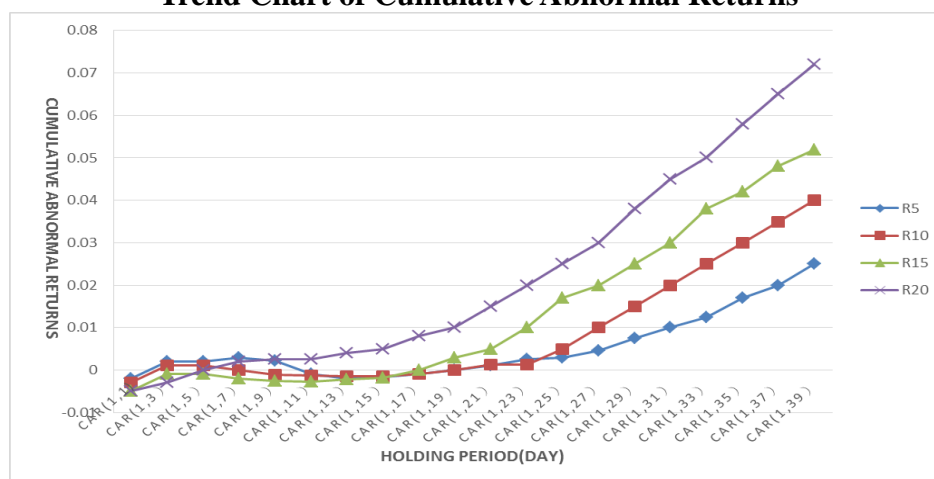
Note: The curves are the CAR differences between the winner and loser portfolios. R5, R10, R15, and R20 stand for the portfolio forming days.

3.2 Market Overreaction to the Press Coverage

According to Tversky and Kahneman (1974), availability heuristic, an empirical rule, refers to "evaluating the frequency and probability occurred by certain incident accords with the level of situation happing to be kept in mind easily to determine" from a decision maker. Frequent incidents enter in our brain more easily than less frequent incidents if other situation is not taken into consideration. The general investors studying information mainly rely on company massages reported by various broadcasting media. Williams (1956), the research of whose in phycology, states people tend to generate overreaction due to unexpected messages or major events. Accordingly, people tend to over-regard recent massages without evaluating the past information while adjusting their beliefs. On the ground of over-optimism for future causes a soaring in the stock prices. In contrary, the over-pessimism for future results in a steep fall in the stock prices. There are numerous factors possibly causing overreaction. According to the findings from De Bondt and Thaler (1985), the longer forming period a company takes, the greater the returns reverse range afterwards during the holding period. As a result, the press coverage is added in this paper to explore whether the same phenomenon will occur. The empirical result is shown in Table 2.

Firstly, the press coverage is categorized into high, medium and low coverage, and the CARs are compared among the different holding periods. The findings appear either the high press coverage (i.e., Figure 2) or the low press coverage (i.e., Figure 2), causes that the longer the forming period is, the greater the reverse range is, which is consistent with the result that the longer forming period, the greater the reverse returns during the following holding period of De Bondt and Thaler (1985). The differences of press coverage are compared by the category of holding period in order to study whether the role of the forming period is significant. The results show, according to the three panels separated by the days of *T-1~T-5* with the average press coverage, the reverse time of high average coverage is almost the same as the reverse time of the full samples (approximate on the 20th day of the observing period). But the reverse time of low average coverage is later obviously (approximate on the 29th day of the observing period). Furthermore, the difference of loser and winner with high average coverage is smaller than the difference of loser and winner with low average coverage initially. However, it reverses on the 11th day of the holding period. The difference of loser and winner with high average coverage fails to outperform the difference from the low average coverage initially, but the difference is statistically different from zero between two panels. If the average press coverage is divided into three panels according to the days of *T-1~T-30*, the results show the reverse time is rapid at highest average coverage and the lowest average coverage while the reverse level of the winner with high average coverage is the greatest, as well as the reverse level of the loser. However, the

difference of loser and winner with high average coverage deducts the difference of loser and winner with low average coverage is positive. Hence, the difference of loser and winner with high average coverage is greater than the low average coverage initially. According to the empirical results, the higher the press coverage, the more rapid and greater the level of reverse time is.

The researches on the market abnormal returns are controlled for the news release in the past, and most of which separate the samples into with or without the press coverage. For example, Chan (2003) observes the investors' reaction with press message from the perspective of press release, adopting the momentum strategy formed by monthly returns, which differentiates the headlines between correlated and non-correlated categories as well as two situations occurred by the releases of definite press and indefinite press. Whether press releases possess explanation for abnormal returns of momentum strategy is documented on this article. Relatively, based on the press frequency categorized on this study, the higher the press coverage, the more obviously the overreaction in the markets, standing for that the investors will evaluate an event or scenario by the appearing frequency or possibility. As a result, the investors are impressed by frequent exposure of firms and will chose investing in the stock with momentum strategy, which may cause a greater level of stock volatility and the greater of reverse range. This study further regards the level of media exposure as follows with press coverage to verify the empirical results of this section.

3.3 The Overreaction Following the Exposure Intensity

This study adopted the press ranking index, the exposure intensity, of the CMoney as the explanatory variable. Whether the overreaction is influenced by the investors is examined by different levels of exposure intensity. The empirical result shown as Table 3, we can observe that the longer the holding period, the greater the reverse range. From the three categories separated by average exposure intensity, the results of either strong average exposure intensity (Figure 3) or weak average exposure intensity (Figure 3) are similar as those in the prior section.

The differences are compared with all panels categorized by the numbers of holding days. According to the average exposure intensity of days *T-1~T-5* separated into three panels, the findings show the reverse time runs the fastest in the panel of strong exposure intensity (on around the 13th day of the observing period), but the reverse time for the weak average exposure intensity is obvious later (on around the 28th day of the observing period). Furthermore, the difference between loser and the winner of strong average exposure intensity deducts the difference between loser and the winner of weak average exposure intensity appears negative initially and becomes positive from the 11th day. It shows that the difference between the loser and winner of strong average exposure intensity

Table 2
Market Reaction Following the Press Coverage

Panel A   Forming period-5 days

	Average CAR of holding period Press coverage - High				Average CAR of holding period Press coverage -Medium				Average CAR of holding period Press coverage - Low		
Holding Period	CAR(W)	CAR(L)	CAR(L-W)	Holding Period	CAR(W)	CAR(L)	CAR(L-W)	Holding Period	CAR(W)	CAR(L)	CAR(L-W)
1	0.05% *	-0.08% **	-0.13% ***	1	0.20% ***	0.01%	-0.19% ***	1	0.16% ***	-0.06% *	-0.22% ***
2	-0.05%	-0.04%	0.01%	2	0.16% ***	0.11% **	-0.05%	2	0.12% **	-0.02%	-0.14% **
3	-0.14% **	0.00%	0.14% *	3	0.15% **	0.22% ***	0.07%	3	0.05%	0.05%	-0.01%
4	-0.21% ***	0.02%	0.23% ***	4	0.14% **	0.29% ***	0.16% **	4	-0.01%	0.11% *	0.12%
5	-0.30% ***	0.04%	0.33% ***	5	0.07%	0.35% ***	0.29% ***	5	-0.07%	0.14% *	0.21% **
10	-0.38% ***	-0.41% ***	-0.03% ***	10	0.32% **	0.27% ***	0.06%	10	-0.05%	0.01%	0.06%
20	-1.09% ***	-1.03% ***	0.07%	20	0.32% *	0.22%	-0.10%	20	-0.37% **	-0.16%	0.21%
30	-2.57% ***	-1.35% ***	1.22% ***	30	0.06%	0.30%	0.24%	30	-1.41% ***	-0.29%	1.12% ***

Panel B   Forming period-10days

	Average CAR of holding period Press coverage - High				Average CAR of holding period Press coverage -Medium				Average CAR of holding period Press coverage - Low		
Holding Period	CAR(W)	CAR(L)	CAR(L-W)	Holding Period	CAR(W)	CAR(L)	CAR(L-W)	Holding Period	CAR(W)	CAR(L)	CAR(L-W)
1	-0.07% *	-0.05% **	-0.02%	1	0.15% ***	0.03%	-0.12% ***	1	0.12% ***	-0.02%	-0.14% ***
2	-0.08% ***	-0.17% *	0.09%	2	0.16% ***	0.10% **	-0.06%	2	0.10% **	0.05%	-0.05%
3	-0.10% ***	-0.26% *	0.15% **	3	0.19% ***	0.16% **	-0.03%	3	0.09%	0.10%	0.01%
4	-0.14% ***	-0.29% **	0.15% *	4	0.21% ***	0.18% **	-0.03%	4	0.08%	0.10%	0.02%
5	-0.20% ***	-0.30% ***	0.10%	5	0.24% ***	0.17% **	-0.08%	5	0.09%	0.07%	-0.02%
10	-0.34% ***	-0.64% ***	-0.30% **	10	0.56% ***	0.06%	-0.50% ***	10	0.20% *	-0.20% *	-0.40% ***
20	-1.39% ***	-1.23% ***	0.16%	20	0.63% ***	0.20%	-0.44% **	20	-0.52% ***	-0.40% **	0.12%
30	-3.29% ***	-1.01% ***	2.28% ***	30	-0.07%	0.86% ***	0.93% ***	30	-1.89% ***	-0.31%	1.58% ***

Panel C   Forming period-15 days

	Average CAR of holding period Press coverage - High				Average CAR of holding period Press coverage -Medium				Average CAR of holding period Press coverage - Low		
Holding Period	CAR(W)	CAR(L)	CAR(L-W)	Holding Period	CAR(W)	CAR(L)	CAR(L-W)	Holding Period	CAR(W)	CAR(L)	CAR(L-W)
1	0.00%	-0.11% ***	-0.10% **	1	0.18% ***	0.00%	-0.19% ***	1	0.07% **	-0.06% *	-0.13% ***
2	-0.06%	-0.12% **	-0.06%	2	0.23% ***	0.01%	-0.22% ***	2	0.09% *	-0.05%	-0.14% **
3	-0.10% *	-0.14% **	-0.04%	3	0.26% ***	0.03%	-0.23% ***	3	0.09%	-0.03%	-0.12% *
4	-0.12% *	-0.20% ***	-0.08%	4	0.28% ***	0.05%	-0.22% **	4	0.10%	-0.05%	-0.15% *
5	-0.16% **	-0.25% ***	-0.09%	5	0.30% ***	0.04%	-0.26% ***	5	0.09%	-0.09%	-0.18% *
10	-0.43% ***	-0.67% ***	-0.24% **	10	0.48%	0.00%	-0.48%	10	0.06%	-0.21% *	-0.27% **
20	-1.84% ***	-1.03% ***	0.82% ***	20	0.30% *	0.23%	-0.07%	20	-0.81% ***	-0.20%	0.61% ***
30	-4.22% ***	-0.46% **	3.76% ***	30	-0.81% ***	1.30% ***	2.11% ***	30	-2.45% ***	0.26%	2.72% ***

Panel D   Forming period-20 days

	Average CAR of holding period Press coverage - High				Average CAR of holding period Press coverage -Medium				Average CAR of holding period Press coverage - Low		
Holding Period	CAR(W)	CAR(L)	CAR(L-W)	Holding Period	CAR(W)	CAR(L)	CAR(L-W)	Holding Period	CAR(W)	CAR(L)	CAR(L-W)
1	-0.02%	-0.10% ***	-0.08% *	1	0.16% ***	0.00%	-0.16% ***	1	0.06% *	-0.06% *	-0.12% ***
2	-0.11% **	-0.15% ***	-0.04%	2	0.20% ***	0.05%	-0.15% **	2	0.05%	-0.04%	-0.09%
3	-0.20% ***	-0.18% ***	0.03%	3	0.23% ***	0.12% **	-0.11% *	3	0.04%	-0.03%	-0.07%
4	-0.28% ***	-0.21% ***	0.07%	4	0.26% ***	0.17% **	-0.08%	4	0.03%	-0.04%	-0.06%
5	-0.35% ***	-0.25% ***	0.11%	5	0.26% ***	0.22% **	-0.04%	5	0.02%	-0.04%	-0.06%
10	-0.80% ***	-0.58% ***	0.23% *	10	0.40% ***	0.16%	-0.25% **	10	-0.07%	-0.13%	-0.06%
20	-2.56% ***	-0.55% ***	2.01% ***	20	-0.06% ***	0.77% ***	0.84% ***	20	-1.34% ***	0.11%	1.45% ***
30	-5.07% ***	0.14%	5.21% ***	30	-1.42% ***	2.18% ***	3.59% ***	30	-3.16% ***	0.85% ***	4.00% ***

Note: 1. CAR(W) represents CAR in winner portfolios, CAR(L) represents CAR in Loser portfolios, CAR(L-W) represents differences in CAR between the loser and winner portfolios.
2.* indicates 10% level of significance. ** indicates 5% level of significance. *** indicates 1% level of significance.

Table 3
Market Reaction of Different Exposure Intensity

Panel A   Forming period -5 days

Average CAR of holding period Exposure intensity - High				Average CAR of holding period Exposure intensity -Medium				Average CAR of holding period Exposure intensity -Weak			
Holding Period	CAR (W)	CAR (L)	CAR (L-W)	Holding Period	CAR (W)	CAR (L)	CAR (L-W)	Holding Period	CAR (W)	CAR (L)	CAR (L-W)
1	0.10%	-0.09%	-0.19%	1	0.18% ***	0.00%	-0.17% ***	1	0.13% ***	-0.04%	-0.17% ***
2	0.03%	-0.06%	-0.09%	2	0.12% **	0.08% *	-0.03%	2	0.09% *	0.04%	-0.05%
3	-0.04%	-0.01%	0.02%	3	0.07%	0.17% ***	0.10%	3	0.03%	0.11% *	0.08%
4	-0.09%	0.02%	0.11%	4	0.02%	0.25% ***	0.23% ***	4	-0.02%	0.16% **	0.17% **
5	-0.13%	0.05%	0.19%	5	-0.09%	0.30% ***	0.38% ***	5	-0.08%	0.18% **	0.26% ***
10	-0.02%	-0.16% *	-0.14%	10	-0.08%	0.27% **	0.35% ***	10	-0.06%	-0.19% *	-0.13%
20	-0.51% ***	-0.47% ***	0.04%	20	-0.30% *	0.16%	0.46% **	20	-0.33% **	-0.65% ***	-0.32% *
30	-1.77% ***	-0.41% **	1.35% ***	30	-0.99% ***	0.07%	1.06% ***	30	-1.16% ***	-0.99% ***	0.17%

Panel B   Forming period -10 days

Average CAR of holding period Exposure intensity - High				Average CAR of holding period Exposure intensity - High				Average CAR of holding period Exposure intensity - High			
Holding Period	CAR (W)	CAR (L)	CAR (L-W)	Holding Period	CAR (W)	CAR (L)	CAR (L-W)	Holding Period	CAR (W)	CAR (L)	CAR (L-W)
1	0.01%	-0.04%	-0.06%	1	0.10% ***	0.01%	-0.08% **	1	0.11% ***	-0.03%	-0.14% ***
2	-0.04%	-0.04%	0.00%	2	0.08% *	0.10% **	0.03%	2	0.05%	-0.01%	-0.06%
3	-0.06%	-0.04%	0.02%	3	0.06%	0.18% ***	0.12% *	3	0.02%	0.02%	-0.01%
4	-0.06%	-0.06%	-0.01%	4	0.04%	0.21% ***	0.17% **	4	0.02%	-0.01%	-0.03%
5	-0.03%	-0.10%	-0.07%	5	0.05%	0.22% ***	0.17% *	5	0.01%	-0.08%	-0.09%
10	0.16% *	-0.33% ***	-0.49% ***	10	0.19% *	0.16% *	-0.03%	10	0.07%	-0.61% ***	-0.68% ***
20	-0.86% ***	-0.45% ***	0.41% **	20	-0.17%	0.03%	0.20%	20	-0.25% *	-1.01% ***	-0.76% ***
30	-2.53% ***	0.19%	2.72% ***	30	-1.42% ***	0.48% **	1.90% ***	30	-1.30% ***	-1.13% ***	0.17%

Note: **Panel C   Forming period -15 days**

|	Average CAR of holding period Exposure intensity - High				Average CAR of holding period Exposure intensity - High				Average CAR of holding period Exposure intensity - High		
Holding Period	CAR (W)	CAR (L)	CAR (L-W)	Holding Period	CAR (W)	CAR (L)	CAR (L-W)	Holding Period	CAR (W)	CAR (L)	CAR (L-W)
1	0.06% *	-0.08% ***	-0.14% ***	1	0.09% ***	-0.02%	-0.11% ***	1	0.10% ***	-0.07% **	-0.17% ***
2	0.05%	-0.09% **	-0.15% **	2	0.09% *	0.02%	-0.06%	2	0.12% **	-0.09% *	-0.21% ***
3	0.06%	-0.09% *	-0.14% *	3	0.09% *	0.06%	-0.03%	3	0.10% *	-0.11% *	-0.22% ***
4	0.08%	-0.11% *	-0.19% **	4	0.07%	0.10%	0.03%	4	0.10% *	-0.19% **	-0.29% ***
5	0.09%	-0.13% *	-0.22% **	5	0.07%	0.11%	0.04%	5	0.07%	-0.27% ***	-0.34% ***
10	-0.01%	-0.26% **	-0.25% **	10	0.11%	0.04%	-0.07%	10	0.01%	-0.66% ***	-0.67% ***
20	-1.40% ***	-0.12%	1.28% ***	20	-0.47% ***	0.14%	0.61% ***	20	-0.48% ***	-1.01% ***	-0.54% ***
30	-3.56% ***	0.82% ***	4.38% ***	30	-1.92% ***	1.07% ***	2.99% ***	30	-2.00% ***	-0.78% ***	1.23% ***

Panel D   Forming period - 20 days

	Average CAR of holding period Exposure intensity - High				Average CAR of holding period Exposure intensity - High				Average CAR of holding period Exposure intensity - High		
Holding Period	CAR (W)	CAR (L)	CAR (L-W)	Holding Period	CAR (W)	CAR (L)	CAR (L-W)	Holding Period	CAR (W)	CAR (L)	CAR (L-W)
1	0.07% **	0.00%	-0.07% *	1	0.03%	-0.07% **	-0.10% **	1	0.10% ***	-0.09% ***	-0.18% ***
2	0.03%	0.07%	0.04%	2	0.02%	-0.09% *	-0.10% *	2	0.10% **	-0.11% **	-0.22% ***
3	0.00%	0.11% *	0.11% *	3	-0.02%	-0.08%	-0.06%	3	0.09% *	-0.11% *	-0.21% ***
4	-0.02%	0.15% **	0.17% **	4	-0.06%	-0.08%	-0.03%	4	0.08%	-0.14% *	-0.22% **
5	-0.03%	0.17% **	0.20% **	5	-0.09%	-0.08%	0.01%	5	0.05%	-0.16% *	-0.21% **
10	-0.03%	0.13%	0.16%	10	-0.40% ***	-0.12%	0.28% **	10	-0.04%	-0.56% ***	-0.52% ***
20	-0.93% ***	0.63% ***	1.56% ***	20	-2.15% ***	0.40% **	2.55% ***	20	-0.87% ***	-0.69% ***	0.19%
30	-2.67% ***	1.64% ***	4.31% ***	30	-4.40% ***	1.63% ***	6.03% ***	30	-2.58% ***	-0.11%	2.47% ***

Note:1. According to De Bondt and Thaler (1985) for the research of portfolio structure, 4 panels split into by CAR of forming period, and the winner portfolio is on top 25% return, and the loser portfolio is at the bottom of 25% returns. There five different forming periods separated into 5, 10, 15, 20 and 30 days. According to the value of average exposure intensity of T-R (R = 5, 10, 15, 20, 30) days from high to low, three panels divided as strong, medium and weak. *** is α=1% of obvious standard; ** is α=5% of obvious standard; * is α=1% of obvious standard.

2. CAR(W) represents CAR in winner portfolios, CAR(L) represents CAR in Loser portfolios, CAR(L-W) represents differences in CAR between the loser and winner portfolios.

3.* indicates 10% level of significance. ** indicates 5% level of significance. *** indicates 1% level of significance.

Figure 2
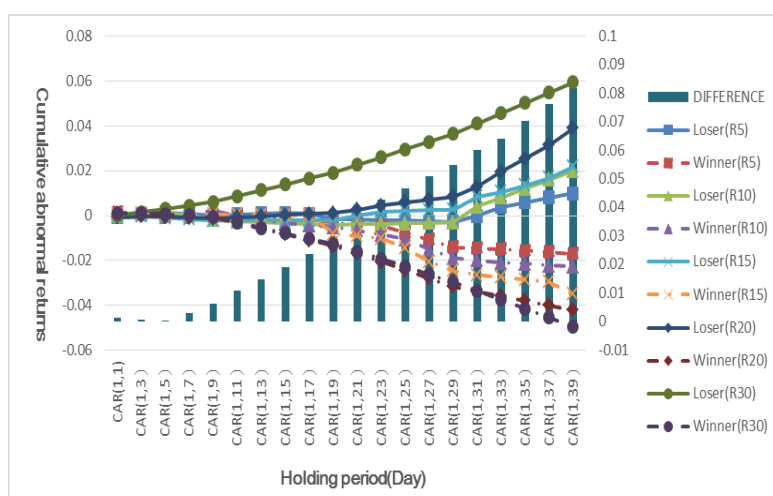## Comparison of CAR (Cumulative Abnormal Returns) between High and Low Press Coverage

A. High Average Press Coverage
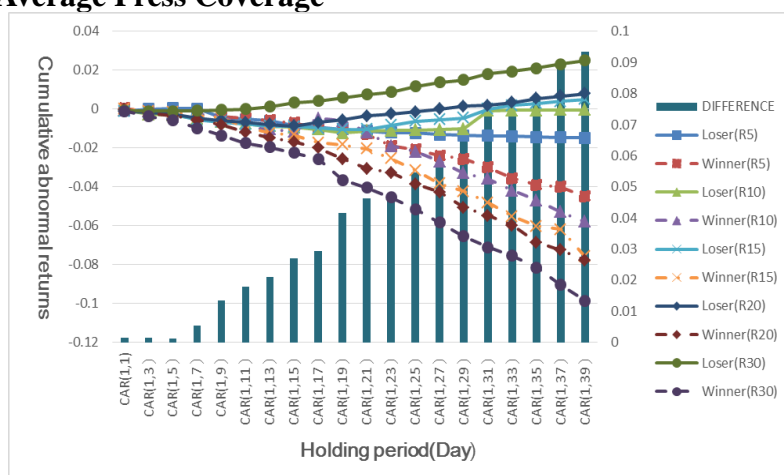
Note: 1. Loser(R5), Loser(R10), Loser(R15), Loser(R20), Loser(R30) are the Portfolios of loser of high average press coverage in five, ten, fifteen, twenty and thirty days, respectively. Winner(R5), Winner(R10), Winner(R15), Loser(R20), Winner(R30) are the portfolios of winner of high average press coverage in five, fifteen, twenty and thirty days, respectively.
2. "DIFFERENCE" is the difference of the 30-day (L-W) holding period deducted 5-day (L-W) holding period
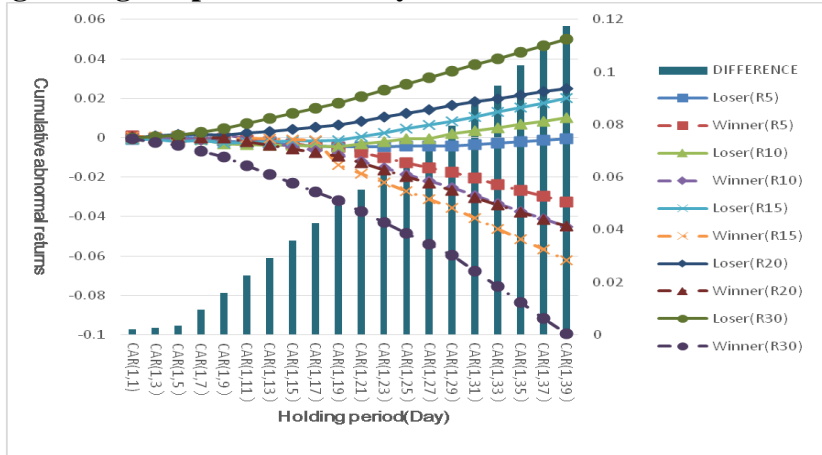
B. Low Average Press Coverage

Note：1. Loser(R5), Loser(R10), Loser(R15), Loser(R20), Loser(R30) are the Portfolios of loser of high average press coverage in five, ten, fifteen, twenty and thirty days, respectively. Winner(R5), Winner(R10), Winner(R15), Loser(R20), Winner(R30) are the portfolios of winner of high average press coverage in five, ten, fifteen, twenty and thirty days, respectively.
2. "DIFFERENCE" is the difference of the 30-day (L-W) holding period deducted 5-day (L-W) holding period

Figure 3
Comparison of CAR (Cumulative Abnormal Returns) between Strong and Weak Average Exposure Intensity

A. Strong Average Exposure Intensity

Note: 1. Loser($R5$), Loser($R10$), Loser($R15$), Loser($R20$), Loser($R30$) are the Portfolios of loser of high average press coverage in five, ten, fifteen, twenty and thirty days, respectively. Winner($R5$), Winner($R10$), Winner($R15$), Loser($R20$), Winner($R30$) are the portfolios of winner of high average press coverage in five, ten, fifteen, twenty and thirty days, respectively.

2. "DIFFERENCE" is the difference of the 30-day (L-W) holding period deducted 5-day (L-W) holding period.

B. Weak Average Exposure Intensity
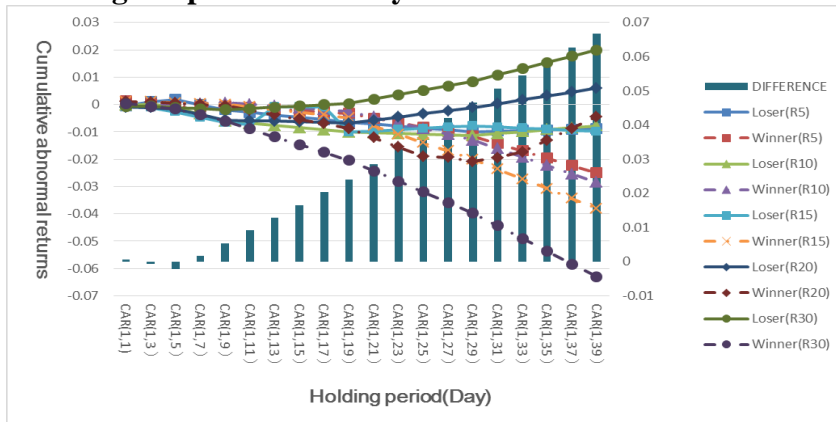
Note: 1. Loser($R5$), Loser($R10$), Loser($R15$), Loser($R20$), Loser($R30$) are the Portfolios of loser of high average press coverage in five, ten, fifteen, twenty and thirty days, respectively. Winner($R5$), Winner($R10$), Winner($R15$), Loser($R20$), Winner($R30$) are the portfolios of winner of high average press coverage in five, ten, fifteen, twenty and thirty days, respectively.

2. "DIFFERENCE" is the difference of the 30-day (L-W) holding period deducted 5-day (L-W) holding period

is not obviously different initially when compared with the difference between loser and the winner of weak average exposure intensity, but the overall difference is significant. Moreover, according to the average exposure intensity of days *T*-1~*T*-30 separated into three panels, the findings show the reverse time runs fastest in the panel with both strong and weak exposure intensity, but the reverse level between the winner and the loser of strong average exposure intensity is the greatest among three panels. However, the difference between loser and the winner of strong average exposure intensity deducts the difference between loser and the winner of weak average exposure intensity is positive, indicating the difference between the loser and winner of strong average exposure intensity is obviously greater than the difference between loser and the winner of weak average exposure intensity initially. The empirical result is the same as that press coverage as well as the media exposure level definitely influence the variation of overreaction.

The empirical results show that the longer the forming period, the greater the return reverse of holding period, controlling for either press coverage, exposure intensity, or bull and bear intensity. Nonetheless, the holding period seems not long enough to conclude when the overreaction will end on this study. De Bondt and Thaler (1985) introduce super-relativistic effect suggesting that the more extreme type a company (extreme-winner and extreme-loser) is, the more obvious the reverse is between the options of winner and loser. The longer the period on this study, the winner and loser are supposed to possess more extremes than the winner and loser with short period. The phenomenon of reverse also expands more greatly and obviously under reinforced media effect on this study.

3.4 The Overreaction Following the Bull and Bear Intensity

As soon as a new message is released into the market, the investors alter the expectation on the future stock prices, influencing further the fluctuation of stock prices in the markets, because the new message may reflect valuable information contents, according to Beaver (1968). Taking De Bondt and Thaler (1985), De Bondt and Thaler (1987), Jegadeesh and Titman (1993), Jegadeesh and Titman (2001), Zhang (2006) as examples, a numerous literature explore some certain events or the reactions to the events in the open markets to examine whether market efficiency exists. Andersen (1996) identified different types of messages that may generate different random process of transaction volatility. In other words, different types of messages may generate heterogeneity for the prices or turnovers in the markets. However, the negative information will result in a more drop than does the positive information. Particularly, as in a dramatic plunge, the investors sell out the stocks remarkably as an abnormal phenomenon. But as the whole market rises owing to a positive message, the investors lead to the abnormal phenomenon of observable purchases. Zhang (2006) claims the

indefinite bear information will result in not only investor's behavioral deviation in psychology, but also greater negative abnormal returns in stock markets.

Besides, the negative information fails to be influential, according to some literature. For example, Cutler, Poterba and Summers (1989) describe the fluctuation remains steady in stock markets while the major news occurs instead of the great fluctuations in the stock markets without major news, appearing the market inefficiency. Dietrich *et al*. (2001) investigate the reaction of the capital markets to the financial statement announcements, considering the efficiency and bounded rationality in the market, and they conclude that the adverse disclosure of financial statements has less impact on the stock prices when financial disclosure follows market efficiency. We employ the press ranking index and the bull and bear intensity of CMoney as the research variable in this section. We assign positive values for good news and negative values for bad news, controlling for bull and bear intensity. The empirical result is shown in Table 4.

Table 4
The Empiric Result of Overreaction Following the Bull and Bear Intensity

Panel A	Forming Period – 5 days						
	Average CAR of holding period Bull and bear intensity – Positive				Average CAR of holding period Bull and bear intensity – Negative		
Holding Period	CAR(W)	CAR(L)	CAR(L-W)	Holding Period	CAR(W)	CAR(L)	CAR(L-W)
1	0.21% ***	-0.01%	-0.22% ***	1	0.06% **	-0.07% **	-0.13% ***
2	0.30% ***	0.06%	-0.24% **	2	0.04%	-0.08% *	-0.05% **
3	0.38% ***	0.14% **	-0.24% **	3	0.02%	-0.08%	-0.06%
4	0.46% ***	0.23% ***	-0.23% *	4	-0.01%	-0.10% *	-0.09%
5	0.51% ***	0.32% ***	-0.19%	5	-0.04%	-0.12% *	-0.08%
10	1.04% ***	0.47% ***	-0.57% **	10	-0.26% ***	-0.40% ***	-0.14%
20	1.04% ***	1.56% ***	0.52% *	20	-1.57% ***	-0.47% ***	1.10% ***
30	0.03%	3.39% ***	3.36% ***	30	-3.58% ***	0.08%	3.63% ***

Panel B	Forming Period – 10 days						
	Average CAR of holding period Bull and bear intensity – Positive				Average CAR of holding period Bull and bear intensity – Negative		
Holding Period	CAR(W)	CAR(L)	CAR(L-W)	Holding Period	CAR(W)	CAR(L)	CAR(L-W)
1	0.05% *	-0.04%	-0.09% **	1	0.15% ***	0.00%	-0.15% **
2	0.00%	-0.04%	-0.04%	2	0.12% *	0.05%	-0.07%
3	-0.04%	-0.06%	-0.02%	3	0.24% **	0.11% *	-0.13%
4	-0.05%	-0.07%	-0.02%	4	0.35% ***	0.12% *	-0.23% *
5	-0.05%	-0.08%	-0.03%	5	0.40% ***	0.10%	-0.30% **
10	0.02%	-0.42% ***	-0.43% ***	10	0.49% **	0.12%	-0.37% *
20	-0.77% ***	-1.04% ***	-0.27% *	20	0.71% ***	0.46% **	-0.25%
30	-2.30% ***	-1.13% ***	1.17% ***	30	0.08%	1.59% ***	1.51% ***

Panel C   Forming Period – 15 days

Holding Period	Average CAR of holding period Bull and bear intensity – Positive (Good news)			Holding Period	Average CAR of holding period Bull and bear intensity – Negative (Bad news)		
	CAR(W)	CAR(L)	CAR(L-W)		CAR(W)	CAR(L)	CAR(L-W)
1	0.07% **	-0.07% **	-0.13% ***	1	0.22% ***	0.00%	-0.22% ***
2	0.06%	-0.08% *	-0.13% **	2	0.29% ***	0.08% *	-0.21% **
3	0.05%	-0.08%	-0.13% **	3	0.32% ***	0.15% **	-0.18%
4	0.06%	-0.12% *	-0.16% **	4	0.33% **	0.20% **	-0.13%
5	0.04%	-0.16% **	-0.20% **	5	0.35% **	0.24% **	-0.18%
10	-0.05%	-0.50% ***	-0.45% ***	10	0.67% ***	0.37% ***	-0.30% *
20	-1.07% ***	-0.90% ***	0.17%	20	1.31% ***	1.09% ***	-0.22%
30	-2.90% ***	-0.57% ***	2.23% ***	30	0.29%	2.55% ***	2.25% ***

Panel D   Forming Period – 20 days

Holding Period	Average CAR of holding period Bull and bear intensity – Positive (Good news)			Holding Period	Average CAR of holding period Bull and bear intensity – Negative (Bad news)		
	CAR(W)	CAR(L)	CAR(L-W)		CAR(W)	CAR(L)	CAR(L-W)
1	0.09% ***	-0.06% *	-0.15% ***	1	0.23% ***	-0.05%	-0.38% ***
2	0.02%	-0.01%	-0.03%	2	0.26% ***	0.08%	-0.16% *
3	-0.05%	0.06%	0.11%	3	0.21% **	0.10%	-0.11%
4	-0.12% **	0.06%	0.18% **	4	0.24% *	0.21% *	-0.03%
5	-0.21% ***	0.07%	0.28% ***	5	0.21%	0.31% **	-0.10%
10	-0.25% **	-0.42% ***	-0.27%	10	0.43% **	0.29% *	-0.14%
20	-0.81% ***	-1.34% ***	-0.53% ***	20	0.44% *	0.01%	-0.43%
30	-2.10% ***	-2.15% ***	-0.05%	30	0.22%	0.38%	0.16%

Panel E   Forming Period – 30 days

Holding Period	Average CAR of holding period Bull and bear intensity – Positive (Good news)			Holding Period	Average CAR of holding period Bull and bear intensity – Negative (Bad news)		
	CAR(W)	CAR(L)	CAR(L-W)		CAR(W)	CAR(L)	CAR(L-W)
1	0.21% ***	-0.01%	-0.22% ***	1	0.00%	-0.05% *	0.05%
2	0.30% ***	0.06%	-0.24% **	2	-0.07% *	-0.04%	0.03%
3	0.38% ***	0.14% **	-0.24% **	3	-0.15% **	-0.04%	0.11% *
4	0.46% ***	0.23% ***	-0.24% *	4	-0.20% ***	-0.04%	0.16% **
5	0.51% ***	0.32% ***	-0.19%	5	-0.27% ***	-0.04%	0.23% ***
10	1.04% ***	0.47% ***	-0.57% **	10	-0.79% ***	-0.01%	0.78% ***
20	1.04% ***	1.56% ***	0.52% *	20	-2.63% ***	0.47% ***	3.03% ***
30	0.03%	3.39% ***	3.36% ***	30	-4.99% ***	1.40% ***	6.40% ***

Note: 1. According to De Bondt and Thaler (1985) for the research of portfolio structure, 4 panels split into by CAR of forming period, and the winner portfolio is on top 25% return, and the loser portfolio is at the bottom of 25% returns. There five different forming periods separated into 5, 10, 15, 20 and 30 days. According to the value as positive and negative of bull and bear intensity of T-R (R = 5, 10, 15, 20, 30) days, two panels divided as bull (good news) and bear (bad news).

2. CAR(W) represents CAR in winner portfolios, CAR(L) represents CAR in Loser portfolios, CAR(L-W) represents differences in CAR between the loser and winner portfolios. 3. * indicates 10% level of significance. ** indicates 5% level of significance. *** indicates 1% level of significance.

3.* indicates 10% level of significance. ** indicates 5% level of significance. *** indicates 1% level of significance.

Firstly, this section is categorized by positive and negative average bull and bear intensity, comparing with the difference of holding period between all panels. The findings appear the longer the holding period is, the greater the reverse range is, under both the positive average bull and bear intensity and the negative average bull and bear intensity. It is consistent with De Bondt and Thaler (1985) supporting that the longer the forming period, the greater the reverse range and the result of the previous section. Furthermore, the observations are categorized by holding period, comparing with the difference of positive and negative of average bull and bear intensity between all panels. According to the two panels categorized by average bull and bear intensity of *T-1~T-5* days, the negative average bull and bear intensity (hereafter bad news) and reverse time without categorizing is even (on around the 14th day during the observing period), but the positive average coverage (hereafter good news) and the reverse time will delay (on around the 17th day during the observing period). Furthermore, the difference between loser and the winner of good news is higher than the difference between loser and the winner of bad news at the beginning, but they reverse from the 17th day during the holding period. It shows that the difference between the loser and winner of good news is greater than the bad news, but it is less than that of bad news afterwards. However, the difference between the two panels with t-stat test is obviously different from zero. According to the three panels categorized by average bull and bear intensity of *T-1~T-30* days, the reverse time of bad news is as fast as uncategorized, but the reverse of good news delays (on around the 18th day during the observing period). The difference between loser and the winner of good news is lower than the difference between loser and the winner of bad news, suggesting that the difference of bad news between loser and winner during the holding period is greater than good news as well as the difference between two panels since the t-stat test is obviously different from zero. As far as the empirical result is discovered in this section, both the reverse time is faster and the level is greater for the bad news than for the good news.

Adopting new information to explore the reaction in the market in the past discovers that bad news influences stock price excessively than does the good news. Taking Gosnell *et al*. (1994) as an empirical example, the tested and verified results support that investors are appalled by the bad news rather than the good news, by measuring the average abnormal returns. Hence, the reverse time of holding period afterwards is faster as well as the reverse range is greater. Conversely, the investors facing the good news delay the reverse time as well as the reverse level, which is less than the reaction when facing the bad news.

3.5 Robustness Test – Size Effect

Apart from the forming period influencing the returns of winner and loser during the holding period, the press release frequency of company reported by media will also be important, according to De Bondt and Thaler (1985). The literature suggests that firm size is a significant and valuable factor. Generally speaking, the information for the large firms is more transparent and the liquidity of information for small firms is lower. According to Hong, Lim, and Stein (1999), the speed of the information publication is slower for small firms owing to less coverage of financial analysts. However, the lower transparency of company information and the level of disclosure can result in the asymmetric problem between the companies and investors. Particularly, the asymmetric problem is more serious for the small-cap investors. Accordingly, a company with better information disclosure, liquidity, and corporate governance will attract more small individual investors, hence supporting the firm size effect indirectly on investment decisions.

Following the classifying approach of Chopra, Lakonishok and Ritter (1992), most CARs in Table 5 are significantly different from zero, and the average CARs of the extreme portfolios with high press coverage, CAR(L-W), are positive (0.52%, 1.07%). It proposes that the average difference between the loser and the winner for the large companies is greater than the small companies regardless of the forming period. But the difference for the small companies surpasses that for the large companies gradually. In contrary, the average is negative (-0.29%, -0.51%) for the extreme portfolios of low press coverage, CAR(L-W). It shows that the low average difference between the loser and the winner for the large companies is less than that for the small companies regardless of the forming period. But comparing with high press coverage, the findings show the difference of small companies surpasses the time sooner than the large companies. Moreover, the speed of news releases of the small companies is slower so that the return reverse is also slower than the large companies. The information asymmetry of the small companies is more serious than that of the large companies, along with the longer holding period, the reverse range of the small firms will surpass that of the large companies.

Furthermore, most CARs are significantly different from zero, from the perspective of exposure intensity[3], and the average of CARs(L-W) of the stronger extreme portfolios of exposure intensity is inferior to the results associated with the previous press coverage. On average, the CARs(L-W) of extreme portfolios of strong exposure intensity are larger than those of weak exposure intensity. Additionally, as mentioned previously, the time of returns reverse for the small firms is slower than that for the large companies because of the slower speed of information dissemination for the small companies. Hence the information

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[3] Due to the limited space and similar result of press coverage, related tables and figures are deleted.

asymmetry for the small firms is more serious than for the large firms. Therefore, the reverse range with longer holding period for the small firms will surpass that for the large companies.

Table 5
The Overreaction Following the Scale Effect with News Release

Panel A   Forming period-5 days

	Press coverage – High			Press coverage – Low	
Holding period	Large company CAR(L-W)	Small company CAR(L-W)	Holding period	Large company CAR(L-W)	Small company CAR(L-W)
1	0.19% ***	-0.42% ***	1	-0.08% *	-0.45% ***
2	0.53% ***	-0.43% ***	2	0.17% **	-0.57% ***
3	0.80% ***	-0.39% ***	3	0.41% ***	-0.52% ***
4	0.93% ***	-0.29% **	4	0.58% ***	-0.41% ***
5	1.04% ***	-0.17%	5	0.66% ***	-0.30% **
10	0.59% ***	-0.27% *	10	0.42% **	-0.08%
20	0.81% ***	-0.08%	20	0.23%	0.72% ***
30	1.54% ***	1.58% ***	30	0.83% ***	1.78% ***

CAR(L-W)of considering extreme portfolio		CAR(L-W)of considering extreme portfolio	
Average value 0.52%	Value P0.00***	Average value -0.29%	Value P 0.01 ***

Panel B   Forming period -30 days

	Press coverage – High			Press coverage – Low	
Holding period	Large company CAR(L-W)	Small company CAR(L-W)	Holding period	Large company CAR(L-W)	Small company CAR(L-W)
1	-0.02%	-0.03%	1	-0.09% *	0.01% *
2	0.09%	0.09%	2	0.01%	0.01%
3	0.27% **	0.14% *	3	0.07% *	-0.01%
4	0.42% ***	0.13%	4	0.15% **	-0.06%
5	0.64% ***	0.17%	5	0.21% ***	-0.04%
10	1.96% ***	0.42% **	10	0.90% ***	0.03%
20	5.40% ***	2.29% ***	20	3.40% ***	2.25% ***
30	9.26% ***	7.93% ***	30	5.83% ***	8.20% ***

CAR(L-W)of considering extreme portfolio		CAR(L-W)of considering extreme portfolio	
Average value 1.07%	Value P0.00 ***	Average value -0.51%	Value P 0.03**

Note: 1. CAR(W) represents CAR in winner portfolios, CAR(L) represents CAR in Loser portfolios, CAR(L-W) represents differences in CAR between the loser and winner portfolios

2. *indicates 10% level of significance. ** indicates 5% level of significance. *** indicates 1% level of significance.

3. According to De Bondt and Thaler (1985) for the research of portfolio structure, 4 panels split into by CAR of forming period, and the winner portfolio is on top 25% return, and the loser portfolio is at the bottom of 25% returns. There two different forming periods separated into 5 and 30 days. According to the value of press coverage of T-R (R= 5, 30) days from high to low, three panels divided as high, medium and low. Finally, large company and small company according to company value are separated by high panel and low panel.

Finally, most CARs observed are different from zero remarkably in Table 6. Regardless of the forming period and the bull and bear intensity, the average of CAR(L-W)s of the extreme portfolios is negative. The absolute value of CAR(L-W)s of the extreme portfolios with bad news is larger than that with good news, showing that the average difference of loser and winner for the small companies is larger than that for the large companies. The speed of information dissemination of small companies is slower and the time of return reverse is also slower than the large companies. However, as the information asymmetry for the

small companies is more serious than that for the large companies, the reverse range of the small firms exceeds that of the large companies.

Table 6
The Overreaction Following the Scale Effect with Bull And Bear Intensity

Panel A	Forming period- 5 days				
Bull and bear intensity - Positive (good news)			Bull and bear intensity - Negative (bad news)		
Holding Period	Large company CAR(L-W)	Small company CAR(L-W)	Holding Period	Large company CAR(L-W)	Small company CAR(L-W)
1	0.00%	-0.17% **	1	-0.20% **	-0.41% ***
2	0.23% ***	-0.16% **	2	-0.30% **	-0.35% **
3	0.42% ***	-0.13% *	3	-0.38% **	-0.29% *
4	0.54% ***	-0.12% *	4	-0.50% ***	-0.25% *
5	0.67% ***	-0.15% **	5	-0.60% ***	-0.04%
10	0.26% **	-0.46% ***	10	-1.08% ***	-0.25% ***
20	0.11%	-0.07% **	20	-1.41% ***	-0.33% ***
30	0.86% ***	1.60% ***	30	0.31%	0.68% ***

CAR(L-W)of considering extreme portfolio			CAR(L-W)of considering extreme portfolio		
Average value	-0.10%	Value P 0.02 **	Average value	-0.75%	Value P 0.00 ***

Panel B	Forming period- 30 days				
Bull and bear intensity - Positive (good news)			Bull and bear intensity - Negative (bad news)		
Holding Period	Large company CAR(L-W)	Small company CAR(L-W)	Holding Period	Large company CAR(L-W)	Small company CAR(L-W)
1	-0.25% ***	-0.21% **	1	-0.01%	-0.08% **
2	-0.33% **	-0.24% *	2	0.10% *	-0.03%
3	-0.11%	-0.16%	3	0.18% **	0.04%
4	0.08%	-0.12%	4	0.23% **	0.09%
5	0.20%	-0.12%	5	0.28% ***	0.20% **
10	0.35%	-0.23%	10	0.70% ***	0.86% ***
20	1.27% **	1.85% ***	20	2.72% ***	3.47% ***
30	4.51% ***	5.86% ***	30	5.73% ***	7.02% ***

CAR(L-W)of considering extreme portfolio			CAR(L-W)of considering extreme portfolio		
Average value	-0.46%	Value0.00***	Average value	-0.72%	Value0.00 ***

Note: 1. According to De Bondt and Thaler (1985) for the research of portfolio structure, 4 panels split into by CAR of forming period, and the winner portfolio is on top 25% return, and the loser portfolio is at the bottom of 25% returns. There two different forming periods separated into 5 and 30 days. According to the value of bull and bear intensity of T-R (R = 5, 30) days from high to low, two panels divided as positive (good news) and negative (bad news). Finally, large company and small company according to company value are separated by bull panel and bear panel.

   2.CAR(W) represents CAR in winner portfolios, CAR(L) represents CAR in Loser portfolios, CAR(L-W) represents differences in CAR between the loser and winner portfolios

   3. * indicates 10% level of significance. ** indicates 5% level of significance. *** indicates 1% level of significance.

4. Conclusions

The notion of behavioral finance suggests that investors may appear irrational behavior while analyzing the related information in the markets and making the investment decisions, given either overreaction or underreaction to the stock price changes. The empirical results reveal that overreaction does certainly exist in the stock market of Taiwan, and the return reverse of the holding period is

greater along with the longer forming period. Moreover, the samples are controlled for press coverage, exposure intensity, and bull and bear intensity to evaluate press effect. The results show that the greater return reverse of the holding period is associated with the longer forming period. Meanwhile, individual stock can influence the magnitude of overreaction by media effect, apart from the factor of forming period and the higher press coverage and exposure intensity make the pace of return reverse faster. The result mentioned previously is consistent with availability heuristic stated by Tversky and Kahneman (1974). As a result, the investor's bias can be influenced by the media to alter further his/her behavior.

Based on the work of Andersen (1996), different types of messages can generate different random fluctuation process on transactions, which means different types of messages may generate the variations in either the market prices or heterogenetic turnovers. Yet the negative information generates more remarkable effect than does the positive information, which is consistent with the result of this study. If we take firm size into consideration, the size effect can enlarge overreaction. It is possibly due to the larger information asymmetry in the small companies so that the range of return reverse is larger for the small firms than for the large companies. In addition, the speed of message spreading for the small firms is inferior to that for the large companies, thus the time of return reverse is slower for the small firms than for the large companies.

However, the literature of investigating overreaction seems inadequate when the influences of media effect on the stock prices have been explored. Meanwhile, the issues of size effect are studied frequently in the literature and they report that several effects on overreaction are correlated to firm size. The result is valuable for corporate reference. For example, they can try to deliver a massage with sound perspectives and coverage of the company in order to stimulate stock prices or prevent from a drop in the stock prices (Daniel, Hirshleifer and Subrahmanyam, 1998). As far as the investor is concerned, the excess return is able to be acquired by contrary strategies on the overreaction to stock prices. There is a plenty of factors describing overreaction introduced in the past, such as risk factors, size effect, seasonal effect, and so on. This paper evaluates the media effect on the stock prices, and it suggests that media effect is able to explain overreaction. Accordingly, the results of this paper contribute to explain market overreaction from media effect and it is expected to provide another avenue for the future research.

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