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On Stock Return Patterns Following Large Weekly Price Movements: The Case of Hong Kong

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ON STOCK RETURN PATTERNS FOLLOWING LARGE WEEKLY PRICE MOVEMENTS: THE CASE OF HONG KONG

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Abstract

In this paper, I examine the short-run and long-run performance of the largest 49 stocks in Hong Kong market which experience weekly price movements of more than ±10% between 1999 and 2007. For both decline and increase events, one-week significant reversal is documented. But such reversal in returns diminishes very quickly within two or three weeks. From a long-run perspective, I find that large price increases are followed by negative performance, which is consistent with the overreaction hypothesis. However, large price declines are also followed by negative cumulative abnormal returns, which supports the underreaction hypothesis. Such findings indicate that the reaction of investors in the Hong Kong market is marked by a distinct asymmetry. Generally, investors in Hong Kong overreact to good news and underreact to bad ones, which is in support of the overoptimism hypothesis. Furthermore, for decline (increase) events, underreaction (overreaction) is documented to be stronger for larger firms and glamour firms than for smaller firms and value firms.

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1. Introduction

There are three main hypotheses related to investor behaviors following extreme events in the area of finance. The Efficient Market Hypothesis (EMH) is one of the most famous theories in finance, which states that in equity markets where prices react to information efficiently and incorporate news quickly and accurately, investors should be unable to predict future returns and make abnormal profits. A market reaction consistent with this hypothesis would be one where all information contained in a shock is incorporated immediately in equity prices. The Overreaction Hypothesis (OH) suggests that investors will overreact to the arrival of new information and correct their behavior later. As a result, a positive (negative) shock should be followed by a decline (increase) in prices. The Underreaction Hypothesis (UH), on the other hand, suggests that market participants will underreact to the arrival of new information and correct their behavior later. As a result, a large price increase (decline) should be followed by further increase (decline) in prices.

For years, the notion of informationally efficient equity markets has been challenged by many academic researchers and they have long been exploring these hypotheses by examining patterns in stock returns. Many studies document a strong return reversal in the short run and argue that the stock market overreacts to information and irrationally misprices winners or losers. In the U.S. market, for example, Lehmann (1990) documents that stocks with the lowest returns over the prior week or month tend to outperform those with the highest returns over the prior period.

The overreaction hypothesis, first applied by DeBondt and Thaler (1985) in finance, is examined extensively in both U.S. market as well as those outside the U.S. In interpreting the documented phenomenon, DeBondt and Thaler (1985) argue that in

both the winners and losers portfolios, investors essentially overreacted. In the case of loser stocks, investors overreacted to bad news, driving the stocks' share prices down disproportionately. After some time, investors realized that their pessimism was not entirely justified, and these losers began rebounding as investors came to the conclusion that the stock was underpriced. The exact opposite is true with the winners portfolio: investors eventually realized that their exuberance wasn't totally justified.

However, some contradictory evidence is presented for both short run and long run. Zarowin (1990) attributes the documented reversal phenomenon to the size effect and argues that if winners and losers are formed using firms of the same size, the return discrepancy disappears. Jagadeesh and Titman (1993) suggest that prices underreact to information and this underreaction produces profitable “momentum” profits which are from a strategy where one goes long a portfolio consisting of stocks that have performed very well in the past and goes short a portfolio consisting of stocks that have very poor performance in the past. In the long run, Gutierrez and Kelley (2008) find long-lasting continuations in returns rather than the previously documented reversal.

To explain the documented “anomalies”, many explanations have been put forward in the literature. For instance, Lo and Mackinlay (1990) suggest that when some stocks react more quickly than others, a contrarian strategy may still produce profits even if neither stock overreacts to information. In other words, a lead-lag relationship among returns is an important factor which contributes to contrarian profits. Conrad and Kaul (1993) argue that an explanation of contrarian profits may lie on bid-ask biases and infrequent trading, while Cox and Peterson (1994) document evidence consistent with the bid-ask bounce and liquidity as explanation of price reversals. Fama and French (1996) argue that a three-factor model captures the long-term return reversals documented by DeBondt and Thaler (1985) but is unable to explain the evidence of return continuations presented in Jagadeesh and Titman (1993). Daniel, Hirshleifer and Subrahmanyam (1998) assume that investors are overconfident and the

subsequent arrival of information which either confirms or disconfirms investor private information will lead to asymmetric reaction.

Bowman and Iverson (1998) argue that the overreaction and underreaction hypotheses are derived from basic human biases in information processing. So, if they are substantive, they should manifest themselves in many other markets, besides the U.S. one. Thus, this paper tries to contribute to the stream of research by investigating the behavior of stock returns in a market outside that of the U.S. Stock return patterns following large one week movements are examined by using the most recent weekly data in Hong Kong stock market from 1999 to 2007. Specifically, I select the largest 49 firms listed on the Hong Kong Stock Exchange.[1] Such stocks represent the majority of the market capitalization in Hong Kong, more than 70% out of the total market capitalization. For example, in the end of 2007, the largest firms together have a market capitalization of 14,624 billion Hong Kong dollars, representing 71.21% out of the total market capitalization of 20,536 billion Hong Kong dollars[2]. They are all highly liquid and available to investors, representing more than 50% of the total trading volume and more than 70% of the total trading value. For each stock, I calculate the abnormal returns over the period of two weeks prior to and up to 52 weeks after the defined events. Cumulative abnormal returns are used to explore the phenomenon of overreaction or underreaction. Usually, price increases and declines are associated with good news and bad news respectively. Thus, we can examine how investors react to the arrival to new information.

An investigation of stock return patterns in the Hong Kong market is of intrinsic value for several reasons. Firstly, Hong Kong has one of the largest stock exchanges in the world by market capitalization. This market ranked nine at the end of 2004 and six at the end of 2006 in terms of its size. It is the second largest in the Asia-Pacific region after the Tokyo Stock Exchange. Secondly, as Otchere and Chan (2003) noted, there

[1] See Appendix I for a reference.
[2] See Appendix II for the total market size and the market capitalization of the selected firms between 1999 and 2007.

are some unique institutional factors differentiating the Hong Kong market from the U.S market. For example, relatively few regulatory constraints exist in this market. Neither dividends nor capital gains are taxed in the individual level. Individuals and corporations are taxed a relatively low rate. Such favorable tax policy means that when we study the topic of market efficiency in Hong Kong, we could expect little tax-induced distortions. Although explicitly considering such issues is beyond the scope of this paper, such differences are worth noting.

Another factor that makes it worthwhile to examine overreaction or underreaction in this market is the change in short-selling restrictions. Short-selling of securities was generally not permitted in Hong Kong until January 1994, and only seven securities were eligible when the short-selling program began. However, this program has expanded since then, and by 26 November 2007, 567 highly liquid and capitalized stocks were available for short selling. The ability of selling short a stock is essential to any contrarian (momentum) strategy since one must be able to sell short the winners (losers) in order to exploit the market's overreaction (underreaction) phenomenon and earn excess profits (if any). The 49 firms examined in this paper are all highly liquid with a large capitalization. It is feasible for investors to sell short such stocks if the overreaction (underreaction) phenomenon is documented and confirmed in Hong Kong.

The results of this study are summarized as follows: For both decline and increase events, one-week significant reversals are documented. But such reversals in returns diminish very quickly within two or three weeks. From a long-run perspective, I find that large price increases are followed by negative performance, which is consistent with the overreaction hypothesis. However, I further find that large price declines are also followed by negative cumulative abnormal returns, which supports the underreaction hypothesis. Such findings indicate that the reaction of investors in the Hong Kong market is marked by a distinct asymmetry, which is consistent with the argument in Daniel, Hirshleifer and Subrahmanyam (1998). Market participants

generally overreact to good news while underreact to bad news, which is in support of the overoptimism hypothesis in the Hong Kong market.

Several tests of robustness of the results are performed. Firstly, periods of high market sentiment is controlled. Then, I investigate the interdependence of large price movements with one another. Thirdly, I explore the impact of firm size, the size of the initial price movement, market-to-book ratio, and industry membership on the reactions of the stock prices.

The remainder of this paper is organized as follows. Section 2 gives a brief introduction to the existing body of relevant literature. Section 3 describes the data sample and methodology. Section 4 presents and discusses the performance results. Section 5 concludes.

2. Literature Review

There have been extensive empirical studies examining patterns in stock prices. Regardless of the different methodologies used in such studies, many researchers proffered the Overreaction Hypothesis or Underreaction Hypothesis as explanations of the phenomena they documented. Specifically, they examined whether observed anomalous movements in stock prices can be explained by the corrections of investors' disproportionate reactions to new information. Some document return reversals and thus are in favor of the Overreaction Hypothesis, while others document momentum in returns and vote for the Underreaction Hypothesis. Cross-sectional aspects such as market capitalization, bid-ask spread, growth opportunity, etc., are often employed to explain over- and underreaction.

2.1 Literature on overreaction and return reversals

DeBondt and Thaler (1985) are deemed as the first to develop the overreaction hypothesis, which states that a given stock's price goes up (down) too much because of recent good (bad) news associated with the stock but eventually when investors realize they have overreacted, the stock price reverses direction and returns to its fundamental value. This is regarded as a violation of the Efficient Market Hypothesis (EMH) since it would indicate that stock prices are predictable in the long run. In a later paper, DeBondt and Thaler (1987) further suggest that the extreme price reversals are not due to seasonality, size effect, or changes in risk as measured by beta.

Zarowin (1990) replicates the work of DeBondt and Thaler (1985), controlling for size differences between winners and losers. When winner and loser portfolios are formed using firms of the same size, the return discrepancy disappears. Furthermore, when losers are smaller, they outperform the winners; when winners are smaller, they outperform the losers. Therefore, he concludes that the tendency for losers to outperform the winners is due to the fact that loser firms are typically smaller than winners.

Atkins and Dyl (1990) find that in the short run, the stock market overreacts, especially when considering stocks exhibiting large price declines. However, they report that traders are unable to profit from the realized price reversals because of the magnitude of the bid-ask spread and thus conclude that when transaction costs are taken into account, the market is efficient.

Lehmann (1990) uses weekly returns to rank stocks and finds that portfolios of stocks with positive returns in one week typically experience negative returns in the following week, while those with negative returns in one week typically display

positive returns in the following week. Furthermore, in contrast with the finding of Atkins and Dyl (1990), he suggests that arbitrage profits from trading on these patterns persist even after adjusting for the bid-ask spread and transaction costs.

Instead of ranking stocks by their performance in a given time period and choosing the top and bottom performers, other studies evaluate the Overreaction Hypothesis by establishing a trigger return value and examining the subsequent performance of the stocks meeting the criteria. Bremer and Sweeney (1991) examine the reversal pattern of large stock price decreases. They document that stocks experiencing a one-day return of less than -10% tend to rebound for a cumulative 2.2% increase in price over the following two days.

Chopra, Lakonishok and Ritter (1992) conduct a comprehensive examination of the Overreaction Hypothesis. They use the empirically determined price of beta risk and calculate abnormal returns using a comprehensive adjustment for price. They document a significant overreaction effect which cannot be attributed to size or beta.

Cox and Peterson (1994) argue that if liquidity is an important factor in the reversal process, one would expect stronger reversals in less liquid markets and for smaller firms. If the reversal is caused by investors' overreaction, then we should observe that the greater the one-day decline, the greater the reversal. They document significant reversals for days one to three, which is consistent with results from previous work. Also, they document the fact that the degree of reversals declines through time. What's more, they find that small firms reverse more than larger firms and most of the reversals can be explained by the bid-ask spread. The results suggest that larger initial declines do not necessarily lead to greater subsequent reversals and thus do not support the Overreaction Hypothesis.

Jagadeesh and Titman (1995) examines the contribution of stock price overreaction and delayed reaction to the profitability of contrarian strategies. They find evidence

that stock prices overreact to firm-specific information, but react with a delay to common factors. Besides the stock market overreaction explanation, they also support the role of liquidity in explaining stock price reversals.

In a more recent paper, Benou and Richie (2003) examines the long-run reversal pattern for a sample of large U.S. firms that experience significant stock price declines of more than 20 percent during a specific month. They find evidence largely consistent with the Overreaction Hypothesis and document that the magnitude and trend of that reversal differs substantially across industries.

2.2 Literature on underreaction and return continuations

Jagadeesh and Titman (1993) find the strategy of buying winners and selling losers generate significant positive returns over 3- to 12-month holding periods. They argue that the profitability of this strategy is not due to systematic risk or delayed stock price reactions to common factors.

Hong and Stein (1999) assume two types of investors that either rely exclusively on their own private information (newswatchers) or rely exclusively on past price information (momentum trader) and develop a model that predicts initial underreaction to information and a subsequent overreaction.

Benou (2003) examines the behavior of ADR prices following months in which they experienced a decline of 15% or more. Evidence shows that the ADR returns do not exhibit a reversal pattern and tend to be characterized by momentum. Such findings are supportive of the Underreaction Hypothesis rather than Overreaction Hypothesis.

Gutierrez and Kelley (2008), by constructing a portfolio that is long stocks in the

highest decile of the prior week's return and short stocks in the lowest decile, document long-lasting continuations in returns rather than the previously documented reversal. They find that the subsequent momentum profits are strong enough to offset the initial reversal and to produce a significant momentum effect over the full year following portfolio formation. Thus, they argue that, ex post, extreme weekly returns are not too extreme.

2.3 Literature on markets outside that of the U.S.

In terms of markets outside that of the U.S., there are numbers of studies investigating issues related to the overreaction and underreaction of investors. Brailsford (1992) and Allen and Prince (1995), using Australian data, find evidence of significant price reversals for only winner portfolio. Da Costa (1994) examines the overreaction phenomenon in Brazilian market and documents price reversals in two-year returns which are of a greater magnitude than those in the U.S. Richard (1997), by ranking the stock market indices of 16 countries, documents that the international stock market indices tend to display positive autocorrelation in the short-run. However, when the holding period is extended to one year, the ranking period losers begin to outperform ranking period winners. Following the methodology of DeBondt and Thaler (1985), Baytas and Cakici (1999) examine a sample of stocks from seven developed countries: the U.S., Canada, Japan, the U.K., Germany, France and Italy. They document long-run overreaction in all markets except the U.S. Bremer, Hiraki, and Sweeney (1999), using Japanese weekly stock returns, observe a short-term reversal pattern and find that the reversal for losers is related to trading volume, as losers with high volume in one week have a larger reversal in the following week.

3. Data and Methodology

3.1 Sample and data description

This paper examines a sample of the largest companies listed on the Hong Kong stock market. The selected 49 companies represent the majority of the market capitalization in the market, more than 70% out of the total market capitalization.

Hong Kong Stock Exchange (HKEx) fact books list 50 leading companies in market capitalization for each year during 1999-2007. There are 22 local companies appearing consistently among the Top 50 during the nine years. Due to the access of more and more H shares, some local companies appearing among the Top 50 in early years disappeared in recent years.[3] On the other hand, some H shares, such as China Construction Bank Corporation, Industrial and Commercial Bank of China Ltd., Bank of China Ltd., and Ping An Insurance (Group) Co. of China Ltd., become members among the Top 50 recently with high rankings.

To choose representative companies with large market capitalization in Hong Kong stock market, for local companies, I select those appearing among the Top50 for at least five times during the nine years and the resulting number of companies is 44. For the new H shares with large market capitalization, I select those being listed on Hong Kong stock market for at least four years and the selected companies are: PetroChina Co. Ltd., China Petroleum & Chemical Corporation (formerly, Sinopec Corporation), China Telecom Corporation Ltd., China Life Insurance Co. Ltd., and Ping An Insurance (Group) Co. of China Ltd.. The appendix I lists all the 49 companies in the sample.

[3] H shares refer to the shares of companies incorporated in mainland China that are traded on the Hong Kong Stock Exchange.

Prior research finds reversals in weekly returns. As Roll (1984) noted, when using returns formed with transaction prices, part of the documented reversal is due to the spurious negative correlation induced by bid-ask bounce. Following Kaul and Nimalendran (1990), I eliminate this spurious reversal by using quote data instead of transaction prices. Weekly returns are based on the midpoint of the final bid and ask quotes from Friday to Friday from 1999 through 2007. Stocks priced below five dollars at the end of event week t are excluded. The data comes from the Bloomberg Financial Service database.

With mid-point returns in hand, I define the return on a stock at week t as being a "large price decline" if it is below -10% and the return on a stock as being a "large price increase" if it is above 10%. The choice of the trigger value ±10% is because that earlier studies on U.S. market often use a threshold of 20% for monthly data when examining return patterns following large price movements. But in Hong Kong market, stock prices fluctuate more dramatically than that in the U.S. and it is easy for them to go up and down by 5% within a week. Even though monthly trigger values of 20% translate to average weekly trigger values of about 4.6%, for weekly data in Hong Kong, a threshold of 10% is more reasonable. To ensure that there are 52 weeks before and after each event, events are defined from 2000 to 2006.[4] This results in a sample that consists of 562 events, among which 247 are "decline" events and 315 are "increase" events. Table 1 provides a summary description of events across years and months.

From Table 1, we can see that in earlier years just following the Asia Financial Crisis, events happened more frequently than in later years. This may indicate that the Hong Kong stock market becomes more stable as time goes by after the crisis because of fewer extreme events in later years. Increase events distribute more evenly across months. Fewer decline events happened in December than in other months.

[4] Because of the asset pricing model estimation, I need 52 weeks before each event even though I'm not considering the stock price reaction that far before.

The data sample combines a total of 20990 returns in the period between January 1999 and December 2007. Figure 1 shows the return distribution of the whole data sample.

Figure 2 provides the return distribution of the events, themselves. The average return of a decline is -13.4% with a standard deviation of 3.51%. The lowest one week return, -35.59%, took place in September 2001 for the firm China Resources Enterprise. The group of increases has an average return of 13.88% and a standard deviation of 4.56%. The largest event occurred in December 1999 for the firm Pacific Century Cyberworks with a 60.61% return in one week.

3.2 Methodology

To measure abnormal returns of the sample, I use two different benchmarks-the market model and the capital asset pricing model (CAPM). The use of the different benchmark models enhances the robustness and validity of the results.

The first model is commonly used in measuring abnormal returns. As Brown and Warner (1985) noted, the market model performs well in detecting abnormal performance of securities under a wide variety of conditions. Here, the Hang Seng Index (HSI) is used as the market index.

The CAPM takes into account the possible effects of interest rate fluctuation. The level of interest rates plays an important role in a rational investment decision. Investors behave in response to the change of interest rates. If the interest rate increases, investors are more likely to invest a greater portion of capital into fix-income securities and less in stocks.

The parameters of the models are estimated using data from t=-52 to t=-1.[5] The abnormal returns for each event are then calculated from t=-2 to t=4 using the two benchmark models discussed above. Then the average abnormal returns for the sample from t=1 up to t=52 are cumulated over different periods to form cumulative abnormal returns (CARs).

4. Empirical Results and Analyses

4.1 Performance of weekly extreme stocks

I begin by evaluating the performance of stocks with extreme weekly returns over a relatively short horizon-two weeks prior to and four weeks after the event. Table 2 provides the average weekly abnormal returns for a large decline. Both the market model and the CAPM provide qualitatively similar results.[6]

An average large abnormal decline of at least -10.17% is measured in the week of the event, which is in line with the definition of a "large price decline". The two weeks prior to the event show significantly negative abnormal returns between -1.0% and -1.4%. The reversal in the first week following the event is strong, averaging around 0.8%. Since I am using mid-point returns, bid-ask bounce is clearly not the sole source of the documented reversal. This result is consistent with Lehmann (1990), who documents one-week return reversal in the U.S. market using weekly data. Lo and MacKinlay (1990) and Jegadeesh and Titman (1995) identify nonsynchronous trading, inventory management by dealers, and investor overreaction to firm-specific

[5] Other estimation horizons are also used, such as t=-52 to t=-5. Results remain qualitatively similar and thus I just report results estimated from t=-52 to t=-1.
[6] Thus, in later tables, only results from the market model are reported.

news as possible sources of the reversal.[7] Consistent with all three of these hypotheses, I find that the reversal in returns diminishes very quickly: though the AR for the second week is also positive, it's insignificant. Then for the next two weeks, abnormal returns become negative, insignificant for week 3 but significant for week 4.

Table 3 reports the abnormal returns for large price increase. Similarly, I find significantly negative abnormal returns for the two weeks prior to an increase, ranging between -0.7% and -1.1%. Reversal is also evident in the first week following the event but for the next three weeks, abnormal returns are all insignificant and without a clear pattern. Due to the strong reversal in the first week and the negative though insignificant abnormal return in the third week, the CAR for the [1:4]-week interval is negative but insignificant.

Motivated by Gutierrez and Kelley (2008), besides examining short term performance following extreme events, I also examine the performance over a longer horizon up to 52 weeks. Table 4 and Table 5 provide weekly cumulative abnormal returns (CARs) for large price declines and increases, respectively. For decline events, I measure highly significant, negative CARs for almost all the periods. The CARs reach as high as -5.16% for the [4:52]-week interval. This long-term performance analysis strongly supports the Underreaction Hypothesis rather than the Overreaction Hypothesis. For increase events, highly significant, negative CARs are also documented. Such results are quite consistent with the Overreaction Hypothesis, indicating that large price increases are followed by CARs in the opposite direction.

To summarize, for such extreme events, I document strong reversals in the first week following the events. However, the documented reversals diminish so quickly that they reverse direction within two or three weeks. From long-term perspective, for both decline and increase events, CARs are significantly negative up to 52-week horizon. Thus, I find that investors in Hong Kong stock market underreact to bad

[7] Prices quoted by dealers are found to be inversely related to their inventory, which is mean reverting.

news but overreact to good ones, which supports an overoptimistic hypothesis in Hong Kong market and is also consistent with the argument of Daniel, Hirshleifer and Subrahmanyam (1998) that investors are generally overconfident and the subsequent arrival of information which either confirms or disconfirms investor private information will lead to asymmetric reaction.

Figure 3 shows the combined CARs for the two kinds of events. Except for the event week, both curves display a steady negative trend. What's more, from the graph, we can tell that the effect of the event is stronger in the first half of the year (26 weeks) following the event than in the next half of the year, because the curves drop more dramatically in the first few weeks and then become smoother later on.

4.2 Analysis of market sentiment

As Ising et al. (2006) noted, the observed phenomenon might be due to a general market disturbance which is corrected in the subsequent weeks. Thus, in this part, I analyze the relationship between market sentiment and post-event performance.

I define a market return which falls below -5% or exceeds 5% as an indicator for strong market sentiment at the time of the event. To form the events sample, I only include those corresponding to a moderate market return which is greater than -5% and less than 5%. Table 6 provides the results for decline events without a strong market sentiment. We can see that for the two weeks prior to the event, the abnormal returns are highly significantly negative, similar to the results for the overall sample but more pronounced in magnitude. The one-week reversal is quite evident. I document insignificant negative ARs for the second and third weeks and significant negative AR for the four week at 0.1 level. For the period from week one to week four, the CAR is -0.58% and insignificant. For a longer horizon, 52 weeks following the

event, the CAR is -4.61% at 0.01 significance level. Therefore, I find that the documented underreaction for decline events cannot be explained by market sentiment alone.

Table 7 summarizes the results for increase events. Again, they resemble those of the overall sample, but more pronounced in magnitude. Significantly negative ARs are found for the two weeks prior to the event. First-week reversal is strong. Then the next three weeks exhibit insignificant ARs and so does the [1:4]-week interval. The CAR for the long [1:52]-week is significantly negative with a value of -5.71%.

Thus, for both decline and increase events, I find no evidence supporting the hypothesis that the documented over- and underreaction patterns can be attributed to market sentiment.

4.3 Analysis of interdependence

Within the whole sample of 562 events, in 84 cases another event occurs in the week following the decline or increase. The following event is of an opposite sign in 51 cases. A decline is followed by an increase in 22 cases and an increase is followed by a decline in 29 cases. The interdependence analysis here is to explore serial correlation of large price movements with one another, and to see how the exclusion of subsequent events could affect the initial results.

Table 8 provides the abnormal returns for decline events without a subsequent event in the following week. Evidence shows that significantly negative abnormal returns exist in the two weeks prior to the event, similar to the result for the whole sample. But due to the missing event in week one, the short term reversal is stronger. For the first and second weeks following the event, significantly positive abnormal returns are

found, with a value of 0.98% in the first week and 0.62% in the second week. This is quite interesting and even surprising since there are more cases of subsequent reversal events than subsequent momentum events, but the exclusion of subsequent events increases the magnitude of short-term reversal. The reason is that in the initial sample, even there are more reversal events than momentum events following declines, the momentum events are more economically significant. Thus, when the cases with subsequent events are excluded from the sample, stronger reversal is observed. The CAR for [1:4]-week interval is significantly positive due to the evident and strong reversal. The CAR for [1:52]-week interval is less pronounced in magnitude than for the whole sample, though it is still significant.

Table 9 reports the results for increase events without a corresponding event in the following week. Interestingly, less pronounced negative abnormal returns in the prior two weeks are observed. But for the event week, the first week and second week after the event, the documented abnormal returns are more evident. The CAR for [1:4]-week interval is slightly significantly negative and the CAR for [1:52]-week interval is much more pronounced in magnitude, with a value of-6.05%.

The two groups with a contrarian movement in the week following the event show a different picture. Table 10 shows that for decline events followed by an increase, the abnormal return for week one is significant at 0.01 level, with a value of 10.08%. The CAR for [1:4]-week interval is 11.06%, highly significant and positive. The CAR for the long [1:52]-week interval is slightly significant.

Table 11 reports the results for increase events with a decline in the following week. Different from the results for the overall sample, the abnormal returns for the prior two weeks are insignificant, though still negative. The AR in week one is highly significant with a value of -13.07%. Due to the evident reversal in the first week, the CAR for [1:4]-week interval is significantly negative. However, the CAR for the long [1:52]-week interval is negative but insignificant with a value of -3.73%.

4.4 Analysis of stock characteristics

Previous studies suggest that there are various factors that could influence the return pattern following large price movements. Evidence from the U.S. market shows that firm size matters. For large firms, stock price reversals are documented to be more pronounced. In addition, Benou and Richie (2003) suggest that the intensity of the price reversal depends on the size of the initial price movement. Furthermore, many researchers, such as Fama and French (1998) and Conrad, Cooper, and Kaul (2003), paid much attention on the different behavior of value and glamour stocks. The book-to-market ratio is commonly used to measure the market's expectation regarding the firm's ability to generate high cash flow in the future.

Thus, in this part, I analyze the influence of firm size, the size of the initial price movement, and the growth opportunities on the CAR for the [1:26]-week interval for large price declines and increases.

Table 12 reports the results of the cross-sectional regression analyses for decline events. In model 1, only the return of the event week, R0, is included in the regression. The coefficient on R0 is significant and negative, indicating that smaller initial decline is associated with larger decline in the long-run. This is quite consistent with the Underreaction Hypothesis. Note that in all the three regressions, the coefficients on R0 are significantly negative, and the inclusion of other variables does not change this fact.

In model 2, the log of firm size is included as an independent variable and the coefficient on it is significantly negative at 0.1 level. This means that for larger firms, underreaction is stronger than for smaller firms. This is quite intuitive since investors often have an optimistic attitude towards larger firms. When bad news comes, investors underreact in the short-run and correct their disproportionate reactions in the

long-run.

In model 3, the log of market-to-book ratio is included. Since this is a proxy variable for growth opportunities, significantly negative coefficient on it indicates that underreaction is stronger for glamour firms than for value firms. This is also very straightforward since market participants often trust glamour firms with a high market-to-book ratio. The inclusion of this ratio does not change the sign on firm size.

In a word, for decline events, I find significant influence of R0 on the abnormal returns of the following 26 weeks. For larger firms and glamour firms with a high market-to-book ratio, underreaction is documented to be stronger than for smaller firms and value firms. This means that investors in Hong Kong market are very optimistic even when bad news comes.

I repeat the cross-sectional analyses for increase events and Table 13 reports the corresponding results. Similar to the results in the case of decline events, the return of the event week, R0, has significant influence on the abnormal returns of the following 26 weeks. Larger price spikes at the event week are associated with long-term reversals, and the larger the price spike the larger the reversal, consistent with the overreaction hypothesis. For larger firms and glamour firms, overreaction is stronger since the coefficients on market capitalization and market-to-book ratio are both significantly negative. This is quite plausible since investors with high expectation regarding the firm's future growth might behave more sensitively to good news. When good news comes to larger and glamour firms, investors overreact to the information and make the stock price too high. Later on, the stock price returns to its fundamental value and the overreaction is eliminated.

In addition to the variables discussed above, the industry membership was previously documented as a factor that might influence the return patterns. Thus, in a further step, I include the industry membership of each firm into the regression using model 3(see

the Appendix I for a reference of the industry membership for each firm). In the sample, firms are divided into six industry groups: real estate/construction, energy, consumer/retail, finance/insurance, travel/media, and telecom/technology. The results are reported in Table 14. Since the coefficients on other variables are qualitatively similar as in previous tables, I just report the coefficients on the membership. For both decline and increase events, I find no evidence that industry membership influences the documented over- and underreaction patterns.

5. Conclusions

In this paper, I examine a sample of the largest 49 firms in Hong Kong stock market which experience a weekly price change of more than ±10%. Cumulative abnormal returns are calculated up to 52 weeks following the events. Results show that investors in Hong Kong market overreact to good news while underreact to bad ones.

For both decline and increase events, one-week significant reversal is documented. But such reversal in returns diminishes very quickly within two or three weeks. From a long-run perspective, I find that large price increases are followed by negative performance, which is consistent with the overreaction hypothesis. However, large price declines are also followed by negative cumulative abnormal returns, which supports the underreaction hypothesis. Such findings indicate that the reaction of investors in the Hong Kong market is marked by a distinct asymmetry. Generally, investors in Hong Kong overreact to good news and underreact to bad news, which is in support of the overoptimism hypothesis. Furthermore, for decline (increase) events, underreaction (overreaction) is documented to be stronger for larger firms and glamour firms than for smaller firms and value firms. Industry membership does not have power in explaining post-event performance.

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Appendix I

The companies in the sample and their corresponding industry category

HKEx fact books list 50 leading companies in market capitalization for each year during 1999-2007. There are 22 local companies appearing consistently among the Top 50 during the nine years. Due to the access of more and more H shares, some local companies appearing among the Top 50 in early years disappeared in recent years. On the other hand, some H shares become members among the Top 50 recently with high rankings. To choose representative companies with large market capitalization in Hong Kong stock market, for local companies, I select those appearing among the Top50 for at least five times during the nine years and the resulting number of companies is 44. For the new H shares with large market capitalization, I select those being listed in Hong Kong stock market for at least four years and the resulting number is 5.

Firms in the sample are divided into six industry groups: real estate/construction, energy, consumer/retail, finance/insurance, travel/media, and telecom/technology.

Code	Company	Industry Category
Local Shares:		
1	Cheung Kong (Holdings) Ltd.	Real Estate/Construction
2	CLP Holdings Ltd.	Energy
3	Hong Kong and China Gas Co. Ltd.	Energy
4	Wharf (Holdings) Ltd.	Consumer/Retail
5	HSBC Holdings PLC	Finance/Insurance
6	Hongkong Electric Holdings Ltd.	Energy
8	Pacific Century Cyberworks	Real Estate/Construction
10	Hang Lung Development	Real Estate/Construction
11	Hang Seng Bank	Finance/Insurance
12	Henderson Land	Real Estate/Construction
13	Hutchison Whampoa	Consumer/Retail
16	Sun Hung Kai Properties	Real Estate/Construction
17	New World Development	Real Estate/Construction

19	Swire pacific ‘A’	Consumer/Retail
20	Wheelock and Co	Real Estate/Construction
23	Bank of East Asia	Finance/Insurance
53	Guoco Group	Finance/Insurance
66	MTR Corporation Ltd.	Travel/Media
69	Shangri-La Asia	Travel/Media
83	Sino Land Co. Ltd.	Real Estate/Construction
87	Swire pacific ‘B’	Consumer/Retail
97	Henderson Investment	Real Estate/Construction
101	Hang Lung Properties Ltd.	Real Estate/Construction
144	China Merchants Holdings (International) Co. Ltd.	Travel/Media
179	Johnson Electric Holdings	Telecom/Technology
267	CITIC Pacific	Finance/Insurance
291	China Resources Enterprise	Consumer/Retail
293	Cathay Pacific Airways Ltd.	Travel/Media
330	Esprit Holdings Ltd.	Consumer/Retail
363	Shanghai Industrial Holdings	Consumer/Retail
388	Hong Kong Exchanges and Clearing Ltd.	Finance/Insurance
494	Li & Fung Ltd.	Consumer/Retail
511	TVB	Travel/Media
551	Yue Yuen Industrial Holdings	Consumer/Retail
683	Kerry Properties Ltd.	Real Estate/Construction
762	China Unicom Ltd.	Telecom/Technology
883	CNOOC Ltd.	Energy
906	China Netcom Group Corporation (Hong Kong) Ltd.	Telecom/Technology
941	China Mobile Ltd.	Telecom/Technology

992	Lenovo (formerly Legend) Holdings	Telecom/Technology
1038	Cheung Kong Infrastructure	Real Estate/Construction
1199	COSCO Pacific	Travel/Media
2388	BOC Hong Kong (Holdings) Ltd.	Finance/Insurance
2888	Standard Chartered PLC	Finance/Insurance
H Shares:		
386	China Petroleum & Chemical Corporation	Energy
728	China Telecom Corporation Ltd.	Telecom/Technology
857	PetroChina Co. Ltd.	Energy
2318	Ping An Insurance (Group) Co. of China Ltd.	Finance/Insurance
2628	China Life Insurance Co. Ltd.	Finance/Insurance

Appendix II

The size of the selected firms and the total size of Hong Kong market

For the years between 1999 and 2007, the HKEx Fact Books estimate the total size of the whole market as well as the market capitalization of the largest firms. The size of the Hong Kong market and the size of the largest firms are both growing rapidly, but the percentage of the latter out of the whole market is decreasing. However, the largest firms still represent more than 70% of the total market capitalization.

Year	Total size of the largest firms(HK$ billion)	Total size of the whole market(HK$ billion)	Percentage
1999	4,152	4,728	87.82%
2000	4,299	4,795	89.65%
2001	3,350	3,885	86.22%
2002	3,015	3,559	84.71%
2003	4,460	5,478	81.42%
2004	5,207	6,629	78.55%
2005	6,388	8,113	78.73%
2006	10,225	13,248	77.18%
2007	14,624	20,536	71.21%

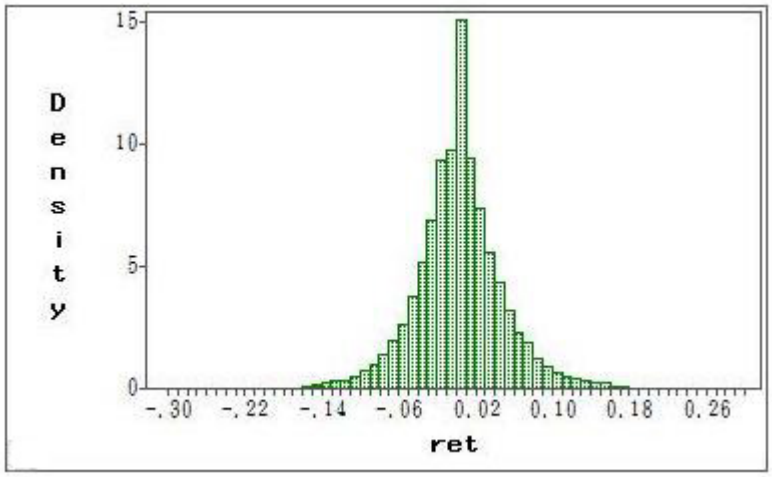

Figure 1. Return distribution of the overall sample

Each week from 1999 to 2007, weekly returns for the selected companies are formed from the mid-points of the quoted bid and ask prices from Friday to Friday. Stocks priced below five dollars at the end of event week are excluded. This figure provides an overview of the return distribution within the overall data sample.

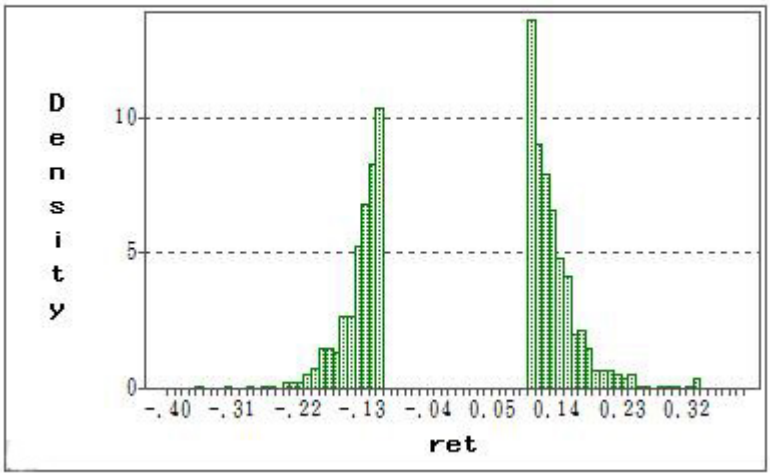

Figure 2. Return distribution of events (declines and increases)

Each week from 1999 to 2007, weekly returns for the selected companies are formed from the mid-points of the quoted bid and ask prices from Friday to Friday. Stocks priced below five dollars at the end of event week are excluded. I define the return on a stock as being a "large price decline" if it is below -10% and the return on a stock as being a "large price increase" if it is above 10%. To ensure that there are 52 weeks before and after each event, events are defined from 2000 to 2006. This figure provides an overview of the return distribution of the events.

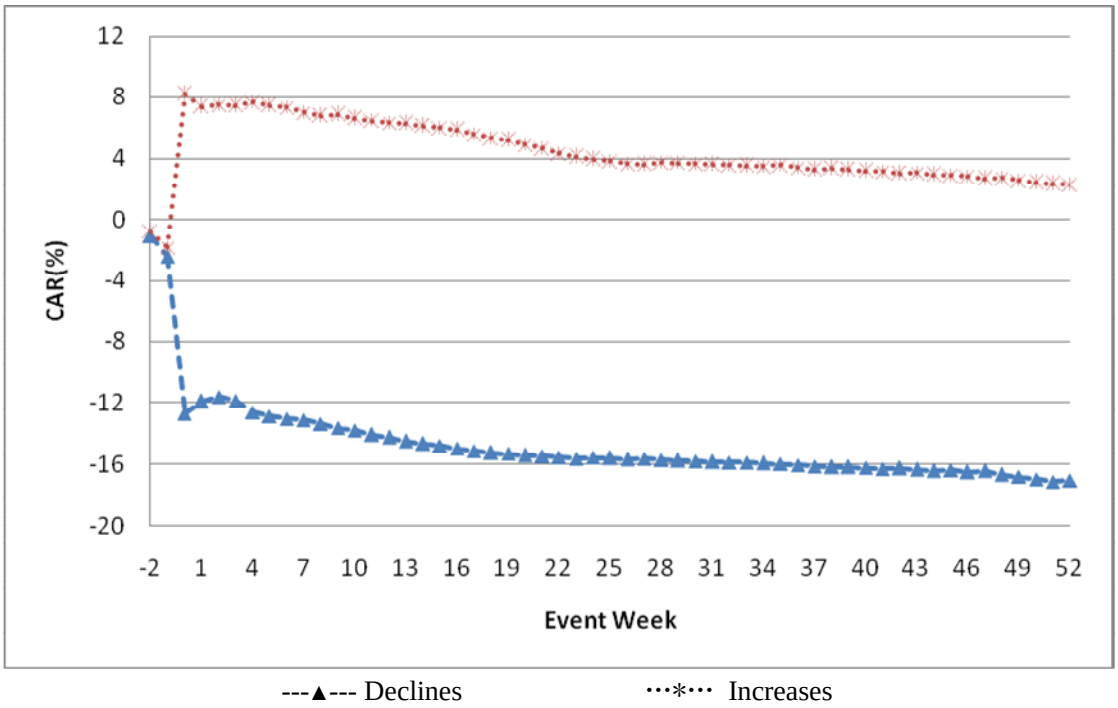

Figure 3. CAR for large stock price decreases and increases over the period of 2 weeks prior to and 52 weeks after the focal event

Table 1-14

Table 1

Distribution of events across time: “declines” (panel A), “increases” (Panel B)

Each week from 1999 to 2007, I get stock price data for the selected companies from Bloomberg Financial Service database. Weekly returns are formed from the mid-points of the quoted bid and ask prices from Friday to Friday. Stocks priced below five dollars at the end of event week are excluded. I define the return on a stock as being a “large price decline” if it is below -10% and the return on a stock as being a “large price increase” if it is above 10%. To ensure that there are 52 weeks before and after each event, events are defined from 2000 to 2006. This provides a sample which consists of 562 events, among which 247 are “decline” events and 315 are “increase” events. This table shows a summary description of events across years and months.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Panel A													
2000	12	3	6	1	5	2	4	0	6	8	4	3	54
2001	1	0	8	3	0	9	0	11	17	4	1	2	56
2002	5	3	2	0	2	4	9	0	3	4	1	1	34
2003	4	0	3	6	1	0	3	0	5	1	0	0	23
2004	2	0	8	6	8	3	0	1	0	0	1	0	29
2005	3	0	1	12	0	0	0	1	6	0	0	1	24
2006	0	10	3	0	6	1	0	0	2	0	5	0	27
Total	27	16	31	28	22	19	16	13	39	17	12	7	247
Panel B													
2000	9	11	8	6	4	7	5	2	12	3	6	7	80
2001	8	1	0	6	1	2	1	0	10	9	14	7	59
2002	6	1	4	2	3	2	1	0	0	12	4	0	35
2003	1	0	3	1	5	4	3	12	10	5	2	1	47
2004	14	3	2	1	5	2	1	0	1	0	0	0	29
2005	3	1	5	0	0	6	4	1	1	0	2	2	25
2006	3	1	2	8	3	5	2	2	3	0	4	7	40
Total	44	18	24	24	21	28	17	17	37	29	32	24	315

Table 2

Weekly abnormal returns (ARs) surrounding large stock price declines

Each week from 1999 to 2007, weekly returns are formed from the mid-points of the quoted bid and ask prices from Friday to Friday. Stocks priced below five dollars at the end of event week are excluded. I define the return on a stock as being a "large price decline" if it is below -10%. To ensure that there are 52 weeks before and after each event, events are defined from 2000 to 2006. In both market model and CAPM model, the expected return is estimated using the 52-week data prior to each event. Then abnormal returns are calculated surrounding the events. Both models produce similar findings. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

	Market Model		**CAPM**	
Event Week	Abnormal Return(%)	t-stat	Abnormal Return(%)	t-stat
-2	-1.07***	-3.14	-1.05***	-2.97
-1	-1.32***	-3.81	-1.29***	-3.75
0	-10.29***	-31.78	-10.17***	-29.58
1	0.79**	1.99	0.81**	2.36
2	0.30	1.57	0.34	1.62
3	-0.28	-0.87	-0.27	-0.84
4	-0.75**	-2.45	-0.73**	-2.34
[1:4]	0.06	1.03	0.15	1.32

Table 3

Weekly abnormal returns surrounding large stock price increases

Each week from 1999 to 2007, weekly returns are formed from the mid-points of the quoted bid and ask prices from Friday to Friday. Stocks priced below five dollars at the end of event week are excluded. I define the return on a stock as being a "large price increase" if it is above 10%. To ensure that there are 52 weeks before and after each event, events are defined from 2000 to 2006. In both market model and CAPM model, the expected return is estimated using the 52-week data prior to each event. Then abnormal returns are calculated surrounding the events. Both models produce similar findings. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

	Market Model		**CAPM**	
Event Week	Abnormal Return(%)	t-stat	Abnormal Return(%)	t-stat
-2	-0.75**	-2.19	-0.73**	-2.16
-1	-1.08***	-3.23	-1.04***	-3.01
0	10.02***	35.57	10.14***	35.76
1	-0.83***	-2.68	-0.78**	-2.54
2	0.11	0.34	0.14	0.42
3	-0.06	-0.20	-0.06	-0.19
4	0.24	0.67	0.25	0.73
[1:4]	-0.54	1.46	-0.45	1.42

Table 4

Weekly cumulative abnormal returns (CAR) for large stock price declines

Each week from 1999 to 2007, weekly returns are formed from the mid-points of the quoted bid and ask prices from Friday to Friday. Stocks priced below five dollars at the end of event week are excluded. I define the return on a stock as being a "large price decline" if it is below -10%. To ensure that there are 52 weeks before and after each event, events are defined from 2000 to 2006. Expected return is estimated using the 52-week data prior to each event. This table reports the cumulative abnormal returns for decline events over different holding periods. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Event Week	CAR	t-stat
[1:13]	-1.83	-1.52
[4:13]	-2.63**	-2.04
[1:26]	-2.97**	-2.38
[4:26]	-3.78***	-2.93
[13:26]	-1.21	-0.86
[1:52]	-4.35***	-3.68
[4:52]	-5.16***	-4.02
[13:52]	-2.59*	-1.95
[26:52]	-1.43	-1.27

Table 5

Weekly cumulative abnormal returns (CAR) for large stock price increases

Each week from 1999 to 2007, weekly returns are formed from the mid-points of the quoted bid and ask prices from Friday to Friday. Stocks priced below five dollars at the end of event week are excluded. I define the return on a stock as being a "large price increase" if it is above 10%. To ensure that there are 52 weeks before and after each event, events are defined from 2000 to 2006. Expected return is estimated using the 52-week data prior to each event. This table reports the cumulative abnormal returns for increase events over different holding periods. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Event Week	CAR	t-stat
[1:13]	-1.95	-0.68
[4:13]	-1.17	-0.39
[1:26]	-4.56***	-2.83
[4:26]	-3.78**	-2.47
[13:26]	-2.65*	-1.72
[1:52]	-5.92***	-3.50
[4:52]	-5.14***	-3.16
[13:52]	-4.01**	-2.54
[26:52]	-1.36	-0.51

Table 6

Weekly abnormal returns (AR) surrounding large stock price declines without a strong market sentiment

Each week from 1999 to 2007, weekly returns are formed from the mid-points of the quoted bid and ask prices from Friday to Friday. Stocks priced below five dollars at the end of event week are excluded. I define the return on a stock as being a "large price decline" if it is below -10%. I define a market return which falls below -5% as an indicator for strong market sentiment at the time of event. To ensure that there are 52 weeks before and after each event, events are defined from 2000 to 2006. Expected return is estimated using the 52-week data prior to each event. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Event Week	AR(%)	t-stat
-2	-1.45***	-3.08
-1	-1.76***	-3.41
0	-13.92***	-25.35
1	1.08*	1.72
2	-0.13	-0.36
3	-0.57	-0.84
4	-0.96*	-1.67
[1:4]	-0.58	-0.93
[1:52]	-4.61***	-3.29

Table 7

Weekly abnormal returns (AR) surrounding large stock price increases without a strong market sentiment

Each week from 1999 to 2007, weekly returns are formed from the mid-points of the quoted bid and ask prices from Friday to Friday. Stocks priced below five dollars at the end of event week are excluded. I define the return on a stock as being a "large price increase" if it is above 10%. I define a market return which exceeds 5% as an indicator for strong market sentiment at the time of event. To ensure that there are 52 weeks before and after each event, events are defined from 2000 to 2006. Expected return is estimated using the 52-week data prior to each event. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Event Week	AR(%)	t-stat
-2	-0.87**	-1.98
-1	-1.02***	-2.73
0	10.65***	33.41
1	-0.96**	-2.15
2	0.14	0.36
3	-0.23	-0.59
4	-0.48	-0.80
[1:4]	-1.53	-0.92
[1:52]	-5.71***	2.27

Table 8

Weekly abnormal returns (AR) surrounding large stock price declines without corresponding event in the following week

Each week from 1999 to 2007, weekly returns are formed from the mid-points of the quoted bid and ask prices from Friday to Friday. Stocks priced below five dollars at the end of event week are excluded. I define the return on a stock as being a "large price decline" if it is below -10%. To ensure that there are 52 weeks before and after each event, events are defined from 2000 to 2006. Expected return is estimated using the 52-week data prior to each event. This table provides abnormal returns for those decline events without any event in the following week. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Event Week	AR(%)	t-stat
-2	-0.94**	-2.46
-1	-1.57***	-4.38
0	-10.13***	-33.42
1	0.98***	2.59
2	0.62**	1.81
3	-0.15	-0.74
4	-0.30	-0.92
[1:4]	1.15**	2.03
[1:52]	-3.86**	-2.35

Table 9

Weekly abnormal returns (AR) surrounding large stock price increases without corresponding event in the following week

Each week from 1999 to 2007, weekly returns are formed from the mid-points of the quoted bid and ask prices from Friday to Friday. Stocks priced below five dollars at the end of event week are excluded. I define the return on a stock as being a "large price increase" if it is above 10%. To ensure that there are 52 weeks before and after each event, events are defined from 2000 to 2006. Expected return is estimated using the 52-week data prior to each event. This table provides abnormal returns for those increase events without any event in the following week. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Event Week	AR(%)	t-stat
-2	-0.43*	-1.71
-1	-0.68**	-2.06
0	10.17***	39.52
1	-1.12***	-3.35
2	-0.34*	-1.68
3	0.09	0.77
4	0.18	0.94
[1:4]	-1.19*	1.92
[1:52]	-6.05**	-4.83

Table 10

Weekly abnormal returns (AR) surrounding large stock price declines with contrarian event in the following week

Each week from 1999 to 2007, weekly returns are formed from the mid-points of the quoted bid and ask prices from Friday to Friday. Stocks priced below five dollars at the end of event week are excluded. I define the return on a stock as being a "large price decline" if it is below -10%. To ensure that there are 52 weeks before and after each event, events are defined from 2000 to 2006. Expected return is estimated using the 52-week data prior to each event. This table provides abnormal returns for those decline events with contrarian event in the following week. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Event Week	AR(%)	t-stat
-2	-1.75**	-2.06
-1	-2.43***	-3.31
0	-12.29***	-8.97
1	10.08***	13.45
2	0.67	1.28
3	0.82	1.44
4	-0.51	-0.96
[1:4]	11.06***	4.73
[1:52]	-7.94*	-1.82

Table 11

Weekly abnormal returns (AR) surrounding large stock price increases with contrarian event in the following week

Each week from 1999 to 2007, weekly returns are formed from the mid-points of the quoted bid and ask prices from Friday to Friday. Stocks priced below five dollars at the end of event week are excluded. I define the return on a stock as being a "large price increase" if it is above 10%. To ensure that there are 52 weeks before and after each event, events are defined from 2000 to 2006. Expected return is estimated using the 52-week data prior to each event. This table provides abnormal returns for those increase events with contrarian event in the following week. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Event Week	AR(%)	t-stat
-2	-1.66	-0.83
-1	-3.28	-1.19
0	11.30***	9.24
1	-13.07***	-11.65
2	-1.94	-0.87
3	-0.52	-0.31
4	0.15	0.08
[1:4]	-15.38**	-3.96
[1:52]	-3.73	-0.14

Table 12

Cross-sectional analysis of CAR for the [1:26]-interval for large price declines

Each week from 1999 to 2007, weekly returns are formed from the mid-points of the quoted bid and ask prices from Friday to Friday. Stocks priced below five dollars at the end of event week are excluded. I define the return on a stock as being a "large price decline" if it is below -10%. To ensure that there are 52 weeks before and after each event, events are defined from 2000 to 2006. Expected return is estimated using the 52-week data prior to each event. This table provides the results of multivariate regression using the following variables: the return of the event week R_0, the log of the firm size, the log of the market-to-book ratio. The t-statistics are in the parentheses and the reported coefficient estimates are multiplied by 100. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

	Model 1	Model 2	Model 3
Constant	-7.4**	-5.7**	-4.6*
	(-2.23)	(-2.08)	(-1.85)
R_0	-33.1*	-26.2*	-18.4*
	(-1.82)	(-1.77)	(-1.69)
ln(size)		-0.049*	-0.012
		(-1.73)	(-1.28)
$\ln(\frac{M}{B})$			-0.7**
			(-2.41)

Table 13

Cross-sectional analysis of CAR for the [1:26]-interval for large price increases

Each week from 1999 to 2007, weekly returns are formed from the mid-points of the quoted bid and ask prices from Friday to Friday. Stocks priced below five dollars at the end of event week are excluded. I define the return on a stock as being a "large price increase" if it is above 10%. To ensure that there are 52 weeks before and after each event, events are defined from 2000 to 2006. Expected return is estimated using the 52-week data prior to each event. This table provides the results of multivariate regression using the following variables: the return of the event week R_0, the log of the firm size, the log of the market-to-book ratio. The t-statistics are in the parentheses and the reported coefficient estimates are multiplied by 100. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

	Model 1	Model 2	Model 3
Constant	-2.1	-1.8	-1.4
	(-1.25)	(-0.94)	(-0.73)
R_0	-17.3*	-16.5*	-14.9
	(-1.71)	(-1.68)	(1.57)
ln(size)		-0.031**	-0.026**
		(2.39)	(2.15)
$\ln(\frac{M}{B})$			-0.68**
			(-2.34)

Table 14

Multivariate analysis of CAR for the [1:26]-interval for large price declines-industry effects

Each week from 1999 to 2007, weekly returns are formed from the mid-points of the quoted bid and ask prices from Friday to Friday. Stocks priced below five dollars at the end of event week are excluded. I define the return on a stock as being a "large price decline" if it is below -10% and the return on a stock as being a "large price increase" if it is above 10%. To ensure that there are 52 weeks before and after each event, events are defined from 2000 to 2006. Expected return is estimated using the 52-week data prior to each event. This table provides the influence of the industry membership of the firms. In my sample, firms are divided into six industry groups: real estate/construction, energy, consumer/retail, finance/insurance, travel/media, and telecom/technology. The dummy variable for energy is excluded to prevent a singular matrix. The t-statistics are in the parentheses. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

	Declines	Increases
Real Estate/Construction	-0.071	0.014
	(-0.83)	(0.22)
Consumer/Retail	0.019	0.026
	(0.15)	(0.41)
Finance/Insurance	-0.049	0.003
	(-0.52)	(0.08)
Travel/Media	0.116	0.087
	(1.27)	(1.45)
Telecom/Technology	-0.063	0.009
	(-0.78)	(0.11)