

Profitability of Short Run Contrarian Strategy: Evidence from Hong Kong Stock Exchange

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Abstract

This paper investigates the profitability of short run contrarian strategy in Hong Kong Stock Exchange covering a time horizon from 2000 to 2009. I report significant positive contrarian profits with 4—, 6— and 8—week formation period. The profits decrease as either formation period or holding period lengthens. When controlled for bid-ask spread, most of those profits diminish. Past winner stocks are prone to behave reversely and generate negative returns across the whole sampling period. This paper also finds that for smallest 30% stocks, 4—week formation strategy shows the strongest profitability regardless the existence of bid-ask spread. Hong Kong stock market is concluded to be in weak form efficiency.

Introduction

The assumption that stock markets are efficient, or at least in weak-form or semi-strong form, has been prevailing for many years, and numerous financial studies are based on such an assumption. The efficient market hypothesis (EMH) (Fama 1970), however, encountered a heavy blow from DeBondt and Thaler (1985), in whose study the return of US stocks exhibits anomaly, or as cited latter, overreaction. This overreaction behavior of stocks implies previous loser stocks tend to become winner while previous winner tend to become loser in a certain period of time. DeBondt and Thaler (1985) are also among the earliest researchers to suggest the probability of earning contrarian profits by taking advantage of price reversal phenomenon. They note that using 3 to 5 years data, contrarian strategy, which consists in buying past loser and selling past winner, yields statistically significant positive profits as high as nearly 8% per year across the holding period.

There comes a growing body of literatures shedding light on contrarian strategy afterwards. In those studies the profitability of contrarian strategy is inevitably associated with overreaction phenomenon. Studies have covered various stock markets and time horizons. For example, Dissanaïke (1997) claims strong evidences of overreaction and positive profits of median term contrarian strategy for UK; Chang et al. (1995) find similar results for Japan; Bang, Chaturvedula and Rastogi (2009) for India; Kryzanowski and Zhang (1992) for Canada; Brailsford (1992) and Guant (2000) for Australia.

The overreaction hypothesis is not free of challenges, and thus in the mean time the profitability of contrarian strategy is also questioned. Although DeBondt and Thaler (1985) have proven that US stocks exhibit obvious evidences of overreaction, Chan (1988) and Ball, Kothari and Shanken (1995) argue time varying risks rather than overreaction are responsible for the reversal performance of winner and loser portfolios. They claim that the beta of losers are likely to be much larger than that of winner, and therefore results in large differences in returns. But Zarwin (1990) and Spyrou et al (2005) hold that risk differences fail to fully explain overreaction phenomenon. Zarowin (1990) claims when firm size is controlled in the test, overreaction disappears. Investors cannot earn any significant profits simply by applying contrarian strategy. By analyzing individual stocks, he also suggests when loser stocks are smaller, they outperform winner stocks, while when winner stocks are smaller, they outperform loser. However, Zarowin (1990) is criticized for his biased methodology, and Chopra et al. (1992) use improved methodology and prove the overreaction phenomenon still exists after controlling the size effect. Albert and Henderson (1995) find similar results in favor of overreaction phenomenon. Their researches reveal that overreaction phenomenon seems more significant among small firms than large firms, which perhaps because it is easier for investors to have rational evaluation for large stocks. However, using UK data, Dissanaïke (1997) restricts his research into only large stocks and then finds strong evidence of overreaction. He claims using large stocks has the advantage to overcome the bias caused by bid-ask spread among small firms, and thus rebuts that overreaction occurs mostly in small

stocks. Conrad and Kaul (1993) reject the overreaction hypothesis of DeBondt and Thaler (1985) by arguing the effect of bid-ask spread should be taken account of. Small firms, especially those with low stock prices, tend to have large bid-ask spread, leading to high chances of non-trading. The bid-ask spread and infrequent trading could result in errors in calculating single period returns. Nevertheless, as shown by Loughran and Ritter (1996), the bid-ask spread effect is overstated because of some slips in Conrad and Kaul's methodology. Overreaction has also been found even with a much shorter time horizon. Another paper from Becker et al (2008) even provides empirical test with intraday returns. They report overreaction to bad news for large stocks in S&P500, and even more pronounced overreaction phenomenon for blue chips in DJIA as well as in German XETRA DAX. They record the daily open and close prices and then measure the deviation of daily high and low prices.

Given all the criticisms and methodology refinements in the last two decades, however, the overreaction theory proposed by Debondt and Thaler (1985) still seems to hold. And the profitability of contrarian strategy, short term or long term, is still attracting researchers all over the world. As for Hong Kong stock market, some previous studies have documented the existence of overreaction and profitability of contrarian strategy, but they differ from each other in many aspects. Fung (1999) concludes overreaction exists among large stocks. Composing loser and winner portfolios with respective three large stocks, he found the "loser" portfolio outperforms the "winner" portfolio by almost 10% in the subsequence 12 months after the formation period, and contrarian strategy will generate positive profits. Otchere and Chan (2003) find small but statistically significant overreaction using weekly returns from Hong Kong Stock Exchange. With data covers only from March 1996 to June 1998, they document that large stocks tend to be more likely to show overreaction phenomenon than small stocks, and for the winner stocks, price reversal is more noticeable than the loser stocks. However, they conclude that investor can not earn excess profits from contrarian strategies. Ramiah, et al. (2011) find evidence of substantial contrarian profits with monthly data during the period from 1992 to 2006. They also report the returns for dually traded stocks, and conclude that contrarian profits in Hong Kong are mainly driven by dually-traded stocks.

Despite of above researches, this paper still makes a number of contributions. First, this paper uses the latest data that covers period from 2000 to 2009 for Hong Kong stock market. With more updated data available, this paper will be more convincing in capturing the behavior of Hong Kong stock market. Second, this paper takes firm size into consideration and reports the performance of full sample, small and large subsample. This has rarely been done by other studies for Hong Kong stock market. Third, this paper explores the role of bid-ask spread, which can be interpreted as transaction costs or pricing bias. Fourth, this paper also discusses the magnitude effect in various contrarian strategies and finds out an observable trend for contrarian profits.

Data and methodology

The data in this paper is collected from Datastream. It includes weekly closing prices of all stocks listed in Hong Kong Stock Exchange from the last weekend of December 1999 to the last weekend of February 2010, totally 531 weeks. But as the returns are calculated as $R_{i,t} = \ln(P_{i,t} / P_{i,t-1})$, only 530 weeks are left for study afterwards. There are 1,347 stocks available in February 2010. In the end of 1999, however, only 190 stocks are eligible for the test. Inactive stocks are also included so as to reduce survivor bias.

The methodology in this paper follows the basic frameworks of Debondt and Thaler (1985) and Jegadeesh and Titman(1993), which are the standard methodologies in this type of research.

The winner, loser and contrarian portfolios are constructed as follows:

At the end of week t , all stocks with a return history of at least 52 weeks are ranked in an ascending order based on their past J -week returns, where J takes 4, 6, 8 and 10. In this paper I use non-overlapping data, thus there is no overlap between any two formation periods. Then the stocks are assigned into 10 equally weighted portfolios with the highest decile portfolio is referred as “Loser” and the lowest as “Winner”. In each week t , I also calculate the contrarian strategy (L-W) which can be interpreted as an arbitrage portfolio of selling the past winner and buying the past loser. Those portfolios are held for the subsequent K -week, where K takes 2, 4, 6 and 8, and the average returns across K weeks for winner and loser and L-W portfolios are reported. During these K weeks, portfolios are not rebalanced. These J -and K -weeks combinations provide us with 16 investment strategies.

Conrad and Kaul (1993) and Ball, Kothari, and Wasley (1995) argue that the profitability of contrarian strategies could be overstated by the bias that arises from bid-ask spread, nonsynchronous trading and the illiquidity of markets. Lehmann (1990) claims that if both bid and ask prices are used for computing portfolio returns, the short run contrarian strategy profit might be largely magnified, because it is possible that shorting winner and longing loser is done at the bid (ask) price, while the transaction at the end of holding period is done at the ask (bid) price. Similarly, Jegadeesh and Titman (1995) also find that dealer-inventory related market microstructure effects, in particular the bid-ask spread, explain much of the short-horizon return reversals. In order to investigate if bid-ask spread has played any significant role in the contrarian strategy testing, I skip one week between formation period and holding period. Similar treatment is employed by Jegadeesh (1990), Jegadeesh and Titman (1993) and Rouwenhorst (1998).

Test Results

1. Test results of full sample

Table1 reports the equally weighted average weekly returns of the loser, winner and L-W portfolio, of 16 various strategies. The first column shows different combinations of formation period and holding period (FP-HP). For example, 6--2 strategy means formation period is 6 weeks and holding period is 2 weeks. The rest part of Table1 displays the mean (Mean), standard deviation (Std.Dev), and t-test value (t-value) of stock returns for loser, winner and L-W portfolios.

For 4—, 6—, and 8— week formation periods, contrarian strategies of buying past loser and selling past winner yield statistically significant positive returns. The contrarian profits for 4—2, 4—4, 4—6, 6—2, and 6—4 strategies are significantly positive at 1% level, while those for 4—8, 6—2, 6—4, 8—2, and 8—4 are significantly positive at 5% level. Winner portfolios behave inversely for most of 4—, 6—, and 8— week formation periods. For 4—4, 6—2, 6—8, 8—2, and 8—4 strategies winner portfolios experience statistically negative returns on at least 10% significance level. The return reaches the lowest point of -1.31% per week when winner portfolio is formed based on past 8 weeks performance and held for the next 2 weeks. For loser portfolios, however, no significant trends of movement are observed throughout the whole test period. The results indicate that for short run contrarian strategies, with formation period shorter than 8 weeks, investors could exploit the return reversals and achieve significantly positive returns. When the formation period expands to 10 weeks, such opportunities disappear automatically. Within the profitable contrarian strategies, as holding period grows longer, the profitability also fades away. The results show that the largest profitability lies between 4 to 8 weeks formation period and 2 to 6 weeks holding period, which generate positive average returns with magnitudes ranging from 0.23% to nearly 1%. When formation period becomes as long as 10 weeks, no significant track of performance for any portfolio is detected.

<Insert Table1 here>

Table2 presents the profitability of all 16 contrarian strategies with one week lag between formation period and holding period to alleviate the bid-ask spread mentioned above. The result shows that with the delaying holding period, most of contrarian strategies lose their profitability. Only 6—2 and 8—2 strategies are still significant at 10% level. The magnitudes of average contrarian profits also fall below 0.7%. But the winner portfolios still report negative average returns with statistical significance at 5% level for 4—8 and 6—2 strategies and 10% level for 4—4 and 8—2 strategies.

The results from Table1 and Table2 suggest the profitability of short run contrarian strategies largely comes from bias that arises from bid-ask spread, nonsynchronous trading or the illiquidity of markets. Because Hong Kong stock market ranks among

the top most effectively traded markets in the world, as here for Hong Kong stock exchange, bid-ask spread may be responsible for such bias. Atkins and Dyl (1990) take bid-ask spread as a representative of minimum transaction cost. Table2 indicates that if bid-ask spread is considered, the opportunity of exploiting the market mispricing to earn a positive arbitrage profit is prone to vanish for most of cases. This means the market efficiency is still likely to hold.

As further check, I also recalculate all the strategies with just one day lag. Lehmann (1990) and Kang, al .et (2002) apply similar treatment for short run momentum and contrarian strategies. Different from previous documents, however, in this paper the one-day-lag contrarian strategies are not materially different from no lag contrarian strategies.

<Insert Table2 here>

2. The role played by firm size

So far contrarian strategies with 4—week formation period have shown the strongest sign of positive profits and therefore in this section, this paper will take a close investigation on 4—week formation period strategies. Rouwenhorst (1998), Jegadeesh and Titman (1993) employ similar treatment and construct similar 6—month strategies in their studies on short run return continuation.

It has long been arguing that firm size plays a crucial role in the reversal of stock returns since Zarwin (1990) reported that past winner tend to be larger than past loser in market capitalization. In order to examine the impact of firm size on the performance of contrarian strategy in Hong Kong stock market, in this section the full sample is divided into three catalogues, the large, the middle, and the small. At the last week of each ranking period, all stocks are ranked based on their market values, and then the largest 30% stocks are grouped as Large Cap, the smallest 30% as Small Cap, and the rest as Middle Cap. Because the test result for the Middle Cap is not significantly different from those of full sample, here I only report the results for Large Cap and Small Cap.

<Insert Table3 here>

Table3 shows the average market capitalizations for the full sample, the winner and the loser portfolios at the end of each year from 2000 to 2009. Clearly, winner portfolio is significant larger in capitalization than loser portfolio in every period. The only exception is 2002, when giant Intel (HKG) contributes to the average firm size of loser portfolio, and if this outlier is moved, the average capitalization of loser portfolio falls to only 1004.26, significantly smaller than the corresponding winner portfolio capitalization of 3373.10. The first column presents the average size of all stocks in each period, which is larger than loser and winner portfolio in most cases. This finding indicates that the differences in performance between winner and loser portfolios may be caused by size effect as discussed above.

<Insert Table4 here>

Panel A of Table4 presents the performance of short run contrarian strategy with 4—week formation period in Small Cap. Winner portfolio is reported to experience negative average returns with statistical significance of 1% level in the holding periods. In the first two weeks the average return for winner portfolio drops as much as 1.98% per week. Loser portfolio also behaves reversely in the holding periods, but only the average return for 2—week holding period is significantly positive at 0.83%. As expected, contrarian strategy of buying loser and selling winner yields positive profits ranging from 1.15% to 2.81%. Regardless various holding periods, short run contrarian strategies indicate an opportunity to earn arbitrage profits although as holding periods lengthen the magnitude of such profits decreases. Panel B shows the performance of the same contrarian strategies with one week lag between formation period and holding period. It turns out that most of results are basically identical with Panel A except that the magnitudes of returns are slightly smaller, implying that bid-ask spread cannot account for the existence of contrarian profits for small stocks. Compared with test results from full sample, the results from Table4 indicate that for small firms there are strong evidences of reversal performance of past winner stocks and positive profits for short run contrarian profits even taking account of bid-ask disturbances which have indeed broadened the contrarian profits.

<Insert Table5 here>

In Table5, same tests are implemented for Large Cap stocks. Results in Panel A are generated without any lag between formation period and holding period, while results in Panel B come from tests with one week lag between formation period and holding period to reduce bid-ask spread disturbance. Panel A reports similar outcomes as previous tests. Winner portfolio still sticks with negative average returns around 1% per week in all four holding periods, and the corresponding contrarian strategies result in positive average returns of 1.09% for 4—2 strategy, 0.92% for 4—4 strategy, 0.68% for 4—6 strategy and 0.69% for 4—8 strategy. All results are at 1% significance level. Similarly, none of returns for loser portfolio proves to be statistically significant. For Panel B, however, the situation is quite different. Contrarian strategies are likely to yield negative returns as winner portfolio tends to maintain its position in all holding periods. Yet only 4—4 strategy reaches week statistical significance at 10% level. Evidences of reversal performance for winner and positive profitability of contrarian portfolios are in contract to many studies. For example, Benou and Richie (2003) argue that due to high liquidity and many analysts following those stocks, large cap is not supposed to show any signs of overreaction or momentum, because news will be disseminated rather fast. This finding suggests when controlled the bid-ask spread, winner and loser portfolios may show continuous instead of reversal performances, which is interesting and requires further study.

3. The magnitude effect

Above results present that for different strategies, the magnitude of mean return also varies. For example, from Table4 and Table5 we notice that the contrarian profits of small stocks are almost twice as large as those of large stocks. Table6 reports the differences of contrarian profits between small stocks and large stocks.

<Insert Table6 here>

For 4—2 case, compared with those in large cap, contrarian strategy in small cap earns an extra average return as large as 1.72% per week, and this number becomes even large (1.96%) when the holding period lags one week after formation period. Although as holding period becomes longer, the magnitude of contrarian profit difference declines, it remains statistically significant for various contrarian strategies.

Another noticeable feature for 4—week formation period strategy is that as holding period shortens, that magnitude of contrarian profit gets larger. To examine if this trend is statistically significant, I calculate the differences between contrarian profits for various strategies. Table7 lists the results. The first column shows the interval between two holding periods and the column Difference means the gap between the two corresponding contrarian profits. For example, in the first row of Table7, HP 2—4 indicates the Difference 0.031 is calculated as the contrarian profit of 2—week holding period strategy minus the contrarian profit of 4—week holding period strategy. The following two column reports the standard deviation and t-test value for the Difference. Panel A presents the results for the full sample, the small cap and the large cap with no skipping between formation period and holding period. Panel B repeats the same methodology with skipping one week between formation period and holding period.

<Insert Table7 here>

For the full sample, the differences of contrarian profits for HP 2—4 and HP 4—6 are positive with statistical significance at 10% level. In the case of Small Cap, such differences are positive at 1% significance level for all three stages. When considering the cases in Panel B, however, only the difference of HP 4—6 in Small Cap is marginally significant at 10% level. The result implies there indeed exists a trend that the contrarian profits of 4—week formation period strategies are increasing as holding period shortens. But this trend works out best for small stocks and only partially for the full sample. If we take account for bid-ask spread, this trend fades away.

Summary and Conclusion

This paper investigates the profitability of short run contrarian strategy in Hong Kong stock exchange. Using weekly data from last weekend of December 1999 to the last weekend of February 2010, total 531 weeks, I find strong evidence of statistically significantly positive profits by buying past loser and selling past winner as well as the reversal performance of past winner portfolio. Such contrarian strategy works better with shorter formation periods, such as 4, 6, and 8 weeks, and shorter holding periods, such as 2 and 4 weeks. As either formation or holding period lengthens, the magnitudes of contrarian profits decrease accordingly. When I control the bid-ask effect by skipping one week between formation period and holding period, the profits diminish in most of cases. Only 6—2 and 8—2 strategies remain significant at 10% level. It suggests that as previous studies claim, short run contrarian strategy profit might be largely magnified if bid-ask spreads exist (Lehmann (1990), Conrad, Gultekin, and Kaul (1997)).

To capture the impact of firm size on the profitability of contrarian strategies, I construct three categories based on the market value of each stocks, and focus on Small Cap and Large Cap. For the 4—week formation period strategy, which is taken as the representative strategy, Small Cap subsample shows the strongest evidence of positive contrarian profits. Even when bid-ask impact is considered, such evidence does not fade away. In the case of Large Cap, however, profitability of contrarian strategies diminishes after controlling bid-ask spreads. Also the contrarian profits in small cap is significantly larger than that in large cap. This finding is consistent with previous studies that price continuance or reverse are more common among smaller stocks rather than larger ones. However, contrast to most documents, this paper reports the existence of positive contrarian strategies in short run, while other literatures find that in most markets, US, Europe and etc., momentum strategy works out in short run and contrarian strategy successes in median or long run instead. This inconsistency may imply that Hong Kong stock exchange differs from other markets by some unique features, such as the composition and trading frequency of Hong Kong exchange, the location of Hong Kong, or even the power of Chinese culture. This finding may be of some help to discover new perspectives for further research on Hong Kong stock market.

Although for short term, some anomaly is found and certain contrarian strategies do show significant profitability, as a whole, this paper concludes Hong Kong stock exchange is in weak form efficiency. Because this anomaly may not be enough to reject EMH, as Dimson and Mussavian (1998) argue that EMH does not have to rule out every minor market inefficiency.

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Table1
Profitability of short run contrarian strategies

FP--HP	Loser			Winner			L -W		
	Mean	Std.Dev.	t-value	Mean	Std.Dev.	t-value	Mean	Std.Dev.	t-value
4—2	0.0019	0.0417	0.5068	-0.0056	0.0328	-1.9546*	0.0075	0.0291	2.9320***
4—4	-0.0004	0.0285	-0.1776	-0.0048	0.0237	-2.3537**	0.0043	0.0140	3.5275***
4—6	-0.0010	0.0234	-0.4869	-0.0040	0.0209	-2.1719*	0.0030	0.0115	2.9537***
4—8	-0.0015	0.0211	-0.8036	-0.0038	0.0202	-2.1666*	0.0023	0.0104	2.5832**
6—2	0.0016	0.0397	0.3673	-0.0068	0.0304	-1.9951**	0.0084	0.0267	2.8164***
6—4	0.0014	0.0287	0.4379	-0.0042	0.0261	-1.4405	0.0056	0.0184	2.7283***
6—6	-0.0009	0.0245	-0.3138	-0.0036	0.0225	-1.4156	0.0027	0.0138	1.7493*
6—8	-0.0025	0.0229	-0.9842	-0.0048	0.0215	-2.0030**	0.0023	0.0131	1.5550
8—2	-0.0036	0.0381	-0.7249	-0.0131	0.0216	-4.7043***	0.0095	0.0307	2.4092**
8—4	-0.0023	0.0265	-0.6690	-0.0075	0.0181	-3.2149***	0.0052	0.0165	2.4495**
8—6	-0.0009	0.0242	-0.2880	-0.0042	0.0213	-1.5231	0.0033	0.0151	1.6863*
8—8	-0.0018	0.0201	-0.6865	-0.0044	0.0208	-1.6339	0.0026	0.0145	1.3898
10—2	-0.0102	0.0463	-1.5579	-0.0075	0.0325	-1.6237	-0.0027	0.0308	-0.6286
10—4	-0.0007	0.0309	-0.1549	-0.0036	0.0268	-0.9460	0.0029	0.0220	0.9370
10—6	-0.0015	0.0225	-0.4774	-0.0041	0.0251	-1.1457	0.0026	0.0179	1.0085
10—8	-0.0026	0.0209	-0.8706	-0.0041	0.0203	-1.4183	0.0015	0.0135	0.7845

At the end of week t, all stocks are ranked in an ascending order into 10 deciles based on their past J-week returns. The stocks with the highest previous performance (decile 10) are assigned to Winner portfolio and the stocks with the lowest previous performance (decile 1) Loser portfolio. The strategy of buying past loser and selling past winner is noted as L-W portfolio. All portfolios are equally weighted and held for the subsequent K weeks. This table shows the performances of all those portfolios for the period January 2000 to February 2010. 16 strategies are reported with the mean (Mean), standard deviation (Std.Dev), and t-test value (t-value) of returns for loser, winner and L-W portfolios.

*, **, and *** indicate statistical significance at 10%, 5% and 1% level, respectively. (two-tailed test)

Table2
Profitability of short run contrarian strategies with one week lag between FP and HP

FP--HP	Loser			Winner			L-W		
	Mean	Std.Dev.	t-value	Mean	Std.Dev.	t-value	Mean	Std.Dev.	t-value
4—2	-0.0012	0.0340	-0.3873	-0.0021	0.0313	-0.7791	0.0010	0.0214	0.5258
4—4	-0.0026	0.0265	-1.1214	-0.0036	0.0242	-1.6990*	0.0010	0.0139	0.8241
4—6	-0.0022	0.0218	-1.1481	-0.0029	0.0221	-1.5073	0.0007	0.0114	0.7241
4—8	-0.0026	0.0205	-1.4284	-0.0035	0.0205	-1.9325**	0.0009	0.0103	0.9928
6—2	-0.0030	0.0421	-0.6426	-0.0091	0.0372	-2.1838**	0.0061	0.0317	1.7116*
6—4	-0.0027	0.0273	-0.8899	-0.0045	0.0298	-1.3437	0.0018	0.0193	0.8107
6—6	-0.0034	0.0245	-1.2502	-0.0044	0.0237	-1.6423	0.0009	0.0152	0.5542
6—8	-0.0029	0.0203	-1.2893	-0.0039	0.0227	-1.5334	0.0010	0.0146	0.5960
8—2	-0.0014	0.0351	-0.3111	-0.0070	0.0276	-1.9632*	0.0056	0.0256	1.6932*
8—4	0.0003	0.0265	0.0924	-0.0017	0.0231	-0.5732	0.0020	0.0183	0.8594
8—6	0.0002	0.0222	0.0599	-0.0009	0.0233	-0.3119	0.0011	0.0156	0.5520
8—8	-0.0025	0.0202	-0.9729	-0.0037	0.0222	-1.3023	0.0012	0.0135	0.6881
10—2	-0.0014	0.0381	-0.2583	-0.0005	0.0365	-0.0977	-0.0009	0.0231	-0.2715
10—4	0.0017	0.0212	0.5605	-0.0014	0.0227	-0.4384	0.0031	0.0161	1.3574
10—6	-0.0013	0.0200	-0.4660	-0.0040	0.0216	-1.3155	0.0027	0.0126	1.5176
10—8	-0.0004	0.0186	-0.1590	-0.0018	0.0202	-0.6358	0.0014	0.0106	0.9349

At the end of week t, all stocks are ranked in an ascending order into 10 deciles based on their past J-week returns. The stocks with the highest previous performance (decile 10) are assigned to Winner portfolio and the stocks with the lowest previous performance (decile 1) Loser portfolio. The strategy of buying past loser and selling past winner is noted as L-W portfolio. All portfolios are equally weighted and held for K weeks with one week between formation period and holding period. This table shows the performances of all those portfolios for the period January 2000 to February 2010. 16 strategies are reported with the mean (Mean), standard deviation (Std.Dev) and t-test value (t-value) of returns for all loser, winner and L-W portfolios.

*, **, and *** indicate statistical significance at 10%, 5% and 1% level, respectively. (two-tailed test)

Table3
Average market capitalization (in k\$)

Year	Full Sample	Loser	Winner
2000	6922.53	1718.86	8985.03
2001	14956.88	521.74	1036.60
2002	4541.71	16120.57	3373.10
2003	11318.57	239.80	1630.69
2004	12575.95	482.55	1299.04
2005	12547.53	881.87	1503.48
2006	14323.84	942.62	15974.19
2007	19779.09	2145.58	4791.39
2008	16459.58	4035.48	4606.18
2009	14370.06	1058.27	2253.90

Table4

Profitability of short run contrarian strategies (4—week formation period) for Small Cap

Panel A

FP—HP	Loser			Winner			L-W		
	Mean	Std.Dev.	t-value	Mean	Std.Dev.	t-value	Mean	Std.Dev.	t-value
4—2	0.0083	0.0423	2.2429**	-0.0198	0.0346	-6.5162***	0.0281	0.0330	9.7078***
4—4	0.0028	0.0318	0.9950	-0.0156	0.0229	-7.7983***	0.0184	0.0200	10.5042***
4—6	0.0019	0.0267	0.8258	-0.0121	0.0209	-6.6334***	0.0141	0.0154	10.3977***
4—8	0.0008	0.0236	0.3976	-0.0107	0.0205	-5.9475***	0.0115	0.0124	10.6165***

Panel B

FP—HP	Loser			Winner			L-W		
	Mean	Std.Dev.	t-value	Mean	Std.Dev.	t-value	Mean	Std.Dev.	t-value
4—2	0.0020	0.0380	0.6084	-0.0113	0.0325	-3.9851***	0.0134	0.0291	5.2360***
4—4	-0.0009	0.0298	-0.3329	-0.0109	0.0238	-5.2235***	0.0100	0.0192	5.9622***
4—6	-0.0004	0.0247	-0.1768	-0.0086	0.0220	-4.4697***	0.0083	0.0142	6.6495***
4—8	-0.0013	0.0223	-0.6595	-0.0086	0.0204	-4.7850***	0.0073	0.0111	7.5089***

This table deals with the smallest 30% stocks. At the end of week t , all stocks are ranked in an ascending order into 10 deciles based on their past 4—week returns. The stocks with the highest previous performance (decile 10) are assigned to Winner portfolio and the stocks with the lowest previous performance (decile 1) Loser portfolio. The strategy of buying past loser and selling past winner is noted as L-W portfolio. All portfolios are equally weighted and held for next 2, 3, 4, and 8 weeks. This table shows the performances of all those portfolios for the period January 2000 to February 2010. 4 strategies are reported with the mean (Mean), standard deviation (Std.Dev), and t-test value (t-value) of returns for all loser, winner and L-W portfolios. Panel A reports the profitability of 4—week formation contrarian strategies without lag between formation period and holding period. Panel B reports the profitability of 4—week formation contrarian strategies with one week lag between formation period and holding period to alleviate bid-ask impact.

*, **, and *** indicate statistical significance at 10%, 5% and 1% level, respectively. (two-tailed test)

Table5

Profitability of short run contrarian strategies (4—week formation period) for Large Cap

Panel A

FP--HP	Loser			Winner			L-W		
	Mean	Std.Dev.	t-value	Mean	Std.Dev.	t-value	Mean	Std.Dev.	t-value
4—2	-0.0005	0.0451	-0.1183	-0.0113	0.0325	-3.9851***	0.0109	0.0478	2.5965***
4—4	-0.0017	0.0276	-0.6886	-0.0109	0.0238	-5.2235***	0.0092	0.0293	3.5923***
4—6	-0.0018	0.0228	-0.9144	-0.0086	0.0220	-4.4697***	0.0068	0.0268	2.8988***
4—8	-0.0016	0.0195	-0.9614	-0.0086	0.0204	-4.7850***	0.0069	0.0231	3.4224***

Panel B

FP--HP	Loser			Winner			L-W		
	Mean	Std.Dev.	t-value	Mean	Std.Dev.	t-value	Mean	Std.Dev.	t-value
4—2	-0.0023	0.0355	-0.7506	0.0039	0.0334	1.3438	-0.0063	0.0479	-1.4953
4—4	-0.0030	0.0262	-1.3152	0.0025	0.0258	1.1122	-0.0055	0.0383	-1.6452*
4—6	-0.0023	0.0209	-1.2401	0.0024	0.0229	1.2173	-0.0047	0.0331	-1.6250
4—8	-0.0020	0.0196	-1.1928	0.0014	0.0208	0.7530	-0.0034	0.0295	-1.3240

This table deals with the largest 30% stocks. At the end of week t, all stocks are ranked in an ascending order into 10 deciles based on their past 4—week returns. The stocks with the highest previous performance (decile 10) are assigned to Winner portfolio and the stocks with the lowest previous performance (decile 1) Loser portfolio. The strategy of buying past loser and selling past winner is noted as L-W portfolio. All portfolios are equally weighted and held for next 2, 3, 4, and 8 weeks. This table shows the performances of all those portfolios for the period January 2000 to February 2010. 4 strategies are reported with the mean (Mean), standard deviation (Std.Dev), and t-test value (t-value) of returns for all loser, winner and L-W portfolios. Panel A reports the profitability of 4—week formation contrarian strategies without lag between formation period and holding period. Panel B reports the profitability of 4—week formation contrarian strategies with one week lag between formation period and holding period to alleviate bid-ask impact.

*, **, and *** indicate statistical significance at 10%, 5% and 1% level, respectively. (two-tailed test)

Table6

Difference of contrarian profits between Small and Large Cap (4—week formation period)

Panel A				Panel B			
FP-HP	Difference	Std.Dev.	t-value	FP-HP	Difference	Std.Dev.	t-value
4—2	0.0172	0.0515	3.8134***	4—2	0.0196	0.0523	4.2871***
4—4	0.0092	0.0343	3.0433***	4—4	0.0156	0.0378	4.6940***
4—6	0.0073	0.0291	2.8462***	4—6	0.0130	0.0330	4.4741***
4—8	0.0046	0.0246	2.1343*	4—8	0.0107	0.0302	4.0413***

The column Difference presents the result of the contrarian profit of small cap minus the contrarian profit of large cap. The following two column reports the standard deviation and t-test value for the Difference. Panel A presents the results with no skipping between formation period and holding period. Panel B repeats the same methodology with skipping one week between formation period and holding period.

*, **, and *** indicate statistical significance at 10%, 5% and 1% level, respectively. (two-tailed test)

Table 7
Difference between contrarian profits for 4—week formation period strategy
Panle A

HP	Full Sample			Small Cap			Large Cap		
	Difference	Std.Dev.	t-value	Difference	Std.Dev.	t-value	Difference	Std.Dev.	t-value
2—4	0.0031	0.0208	1.7854*	0.0097	0.0242	4.5621***	0.0016	0.0336	0.5521
4—6	0.0014	0.0086	1.7928*	0.0043	0.0124	3.9767***	0.0024	0.0161	1.7237
6—8	0.0006	0.0052	1.3923	0.0025	0.0083	3.4767***	-0.0001	0.0109	-0.1376

Panle B

HP	Full Sample			Small Cap			Large Cap		
	Difference	Std.Dev.	t-value	Difference	Std.Dev.	t-value	Difference	Std.Dev.	t-value
2—4	0.0000	0.0176	-0.0134	0.0033	0.0220	1.7265	-0.0007	0.0343	-0.2468
4—6	0.0003	0.0073	0.4459	0.0018	0.0114	1.7839*	-0.0008	0.0176	-0.5325
6—8	-0.0002	0.0051	-0.3936	0.0010	0.0086	1.2683	-0.0013	0.0143	-1.0242

The first column shows the interval between two holding periods and the column Difference means the gap between the two corresponding contrarian profits. For example, in the first row of Table 7, HP 2—4 indicates the Difference 0.031 is calculated as the contrarian profit of 2—week holding period strategy minus the contrarian profit of 4—week holding period strategy. The following two column reports the standard deviation and t-test value for the Difference. Panel A presents the results for the full sample, the small cap and the large cap with no skipping between formation period and holding period. Panel B repeats the same methodology with skipping one week between formation period and holding period.

*, **, and *** indicate statistical significance at 10%, 5% and 1% level, respectively. (two-tailed test)