

Profitability of Momentum and Contrarian Strategies: Evidence From Colombo Stock Exchange

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Abstract:-

This paper examines the profitability of momentum and contrarian strategies in the Colombo Stock Exchange (CSE) around 1 to 12 months horizon covering the period from October 1991 to 2005. The study finds that momentum strategies are highly profitable in the CSE. When testing between pre-and post-automation periods of the CSE, the study finds evidence that momentum strategies are more profitable during post-automation period of the CSE.

Keywords: Momentum Strategies, Contrarian Strategies, Colombo Stock Exchange

1. Introduction

Stock returns are related to past performance and, therefore, cross-section of stock returns is predictable based on past returns. For an example, DeBondt and Thaler (1985, 1987) reported that stocks with poor three-to-five year past returns (losers) earn higher average returns than stocks that performed well (winners) in the past. Buying past losers and selling past winners are called the contrarian strategy. Contrary to the contrarian strategy, Jegadeesh and Titman (1993) reported forming portfolios based on past three to twelve months they showed that past winners on average continue to outperform past losers over the next three to twelve months.

Return reversals and continuations are only two of many patterns in anomalies in stock markets. Although these two anomalies have been well tested in the developed capital markets, a comprehensive study has not been carried out in developing markets to test these anomalies.

Examining momentum and contrarian strategies in the CSE around 1 to 12 months horizon is important in several ways. One of the reasons is that, this study is done in the CSE, which is one of the rapidly developing stock markets and from its outset has held a preemption position among Asian stock exchanges. The second is lack of past research in the area of medium term return predictability in developing markets. Most of the studies have been done based on developed markets and none of the studies has been carried out in the South Asian region. Last, the study implies that incorporating all share price index which shows a 0.039 percent average daily return during the sample period, momentum strategy shows much higher returns during the sample period. Consequently, investors especially portfolio managers can make profitable investment strategies based on this information to make money at a zero cost or lower rate.

The rest of this paper is organized as follows: Section 2 reviews the literature. Basic methodology and data are described in Section

3. Section 4 contains empirical results for the momentum and contrarian strategies. Section 5 is the conclusion of the paper.

2. Literature Review

Both momentum and contrarian strategies have been well tested in the USA. They have shown that stock returns both in short- and long-run can be predicted from past returns. De Bondt and Thaler (1985) investigated return patterns over long period of time and find that contrarian strategies are profitable over 3 to 5 year horizon and low return in the subsequent 3-5 years. Hence they recommended to make profitable contrarian strategies buying past losers and selling past winners. They attributed this return behavior as investor overreaction to formation period information. Chan (1988), Ball and Kothari (1989) argued that the winner-loser results are due to failure to risk-adjust returns. Further Gunaratne and Yonesawa (1997) reported that extreme losers outperform the extreme winners by 11 percent per annum in terms of risk adjusted abnormal returns during the subsequent period at Tokyo Stock Exchange. Thereafter Jegadeesh (1990) and Lehmann (1990) provided evidence of short term return reversals. They reported that low returns stocks outperform extreme high returns stocks over a subsequent holding period providing room for creating profitable contrarian strategies in the short run. Lo and Mackinlay (1990) argued that a large part of the abnormal returns documented by Jegadeesh and Lehman is attributable to delayed stock price reaction to common factor. Chang, Mcleavey and Ruhee (1995) reported short term contrarian strategies are profitable in the Japanese market after adjusting systematic risk and firm size.

In contrast Jegadeesh and Titman (1993) documented that strategies which buy past period winner stocks and sell past period loser stocks (momentum strategy) generate significant positive returns (about 1percent per month) for 3 to 12 months holding period. The extended study of Jegadeesh and Titman (2001) reconfirms that momentum effect is not a result of data mining effect. Also, Conrad and Kaul (1998), Lee and Swaminathan

(2000), Chodia and Shivakumar (2002) have found significant momentum profits in the NYSE over 3 to 12 months holding period.

Both momentum and contrarian strategies have also found to work in international markets. Rouwenhorst (1998) examined stock returns during 1980-1995 in twelve European markets. He finds that an internationally diversified portfolio of past medium term winners outperforms a portfolio of medium term losers by 1% per month. Similarly, Chui, Titman and Wei (2000) examined the profitability of momentum strategies in East and South East Asian countriesⁱ. They find positive momentum profits over the entire sample period in all countries except Indonesia, Japan and Korea

Shen, Szakmany and Sharma (2005) examined momentum strategies in 18 developed capital markets using country indices instead of individual security returns. They find momentum profits for medium term horizons which contrarian profits are observed for long holding periods of two to five years. Nijman, Swinkels, and Verbeek (2002) find momentum profits in 18 European countries except Sweden and Austria.

There are some research evidences on short and medium term contrarian strategies. Lehmann (1990) examined the profitability of short term trading strategies in the NYSE and AMEX. He finds sizable return reversals in one week time to make short period contrarian strategies profitable. Chang et al (1995) examined the short term abnormal returns to contrarian investment strategies applied to the Japanese stocks listed on the Tokyo Stock Exchange (TSE). They find statistically significant contrarian profits only in the first year after the portfolio formation. Bildik and Gulay (2002) find significant contrarian profits in the Istanbul stock exchange. Their analysis of contrarian strategies show that holding period returns of past period losers outperform the past period winners in all 1 – 12 months strategies.

In most of the studies, researchers have used one month time lag between end of the

portfolio formation period and beginning of the holding period in order to avoid the potential micro structure biases, thin trading problem and bid-ask spread (Jegadeesh and Titman, 1993; Lee and Swaminathan, 2000; Nijman, Laurens and Mamo, 2002; Chui, Titman and Wei, 2000).

Since 1980's momentum and contrarian strategies have been documented evidences for financial markets across developed countries. In fact, there is lack behind the theoretical and empirical evidences in developing markets. This study provides empirical evidence in the CSE deriving two hypotheses.

3. Data and Methodology

Data:Data used in the study are extracted from the SEC data-library covering the sample period nearly 15 years from October 1991 to June 2005. The sample of the study includes all the voting stocks in the main board and the second board of the CSE. In consistent with the Bildik and Gulay (2002) stocks which have less than 12 months data are excluded from the sample. This sample includes even delisted stocks, and hence the total sample includes 256 companies. Using individual stock returns average percentage monthly returns are computed adjusting for dividends, right issues and bonus issues on the basis of reinvestment assumption.ii

Methodology: The strategies implemented in the study are based on the stocks returns over the past 3, 6, 9 and 12 months and hold the selected stocks for the same 3, 6, 9 and 12 months. This gives total of 16 strategies. Computations are done in two ways. One without a time lag between formation period and the holding period and second, with one month time lag between end of the formation period and beginning of the holding period avoiding possible micro structure biases, thin trading problem and bid-ask spread.

In order to increase the power of statistical tests, the strategies examined include portfolios with overlapping holding periods. Therefore, in any given month t , the strategies hold a series of portfolios that are selected in

the current month as well as in the previous $K-1$ months, where K is the holding period. For example, the monthly return for a three-month holding period is based on equally weighted average of portfolio returns from this month's strategy, last month's strategy, and the strategy from two months ago.

The study uses the same methodology that of Jegadeesh and Titman (1993). At the end of each month, from October 1991 to June 2005, all eligible stocks are ranked in the sample based on past J month returns, for example, month -5 to month 0 , if J is defined as six, and then group the stocks into five equally weighted portfolios based on these ranks. Portfolio P1 represents the stocks with the highest ranking period returns and Portfolio P5 represents the stocks with the lowest ranking period returns. The top quintile portfolio is called the "winners" quintile and the bottom quintile is called the "losers" quintile. In each month t , the strategy buys the winner portfolio and holds this position for K months. Each portfolio is held for K months following the ranking month, for example, month 1 to month 3, if K is defined as three ($K3$). Hence, under this strategy, the weights on $1/K$ of the stocks in the entire portfolio in any given month are revised and carried over the rest from the previous month. The profits of the above strategies were calculated for a series of momentum portfolios (P1-P5) that were rebalanced monthly to maintain equal weights. Average of rebalance momentum profits is presented in the paper.

Hypotheses

If the pattern of the past period stock returns continues in the same direction over the next period, then it forms momentum strategies by selling past period losers (low return stocks) and buying past period winners (high return stocks) and hold this position through the next period. Therefore the null hypothesis (H_0) and the alternative hypothesis (H_1) can be developed as follows:

$$H_0: E(R_{W, t+J} - R_{L, t+J}) = 0$$

$$H_1: E(R_{W, t+J} - R_{L, t+J}) \neq 0$$

Where, $R_{W, t+J}$ is winners' returns in the next period (holding period), $R_{L, t+J}$ is losers' returns in the next period (holding period), $t+J$ is holding period (months), and J represents number of months

The null hypothesis explains that winners and losers have the same expected returns in the holding period. The alternative hypothesis explains that expected returns of winners are higher than that of losers in the holding period.

If the pattern of the past period stock returns changes to the opposite direction in the next period, then contrarian strategies can be formed by selling past period winners (high return stocks) and buying past period losers (low return stocks) and holding this position through the next period. Therefore the null hy-

pothesis (H0) and the alternative hypothesis (H1) can be developed as follows:

$$H_0: E(R_{L, t+J} - R_{W, t+J}) = 0$$

$$H_1: E(R_{L, t+J} - R_{W, t+J}) \neq 0$$

The null hypothesis explains that losers and winners have the same expected returns in the holding period. The alternative hypothesis explains that losers expected returns are higher than the winners expected returns in the holding period.

4. Empirical Results

Table 1 summarizes results from several price momentum portfolio strategies. Each month stocks are ranked and grouped into five portfolios on the basis of their returns over the previous 3, 6, 9 and 12 months. Results are reported for the top quintile portfolio of extreme winners (P1) and extreme losers (P5) together with zero cost momentum portfolios (P1-P5).

The other intermediate portfolio results are omitted to reduce the complication of the presentation.

Table 1
Momentum and Contrarian Strategies, 1991-2005

	K=3			K=6			K=9			K=12		
	P ₁	P ₅	P ₁ -P ₅	P ₁	P ₅	P ₁ -P ₅	P ₁	P ₅	P ₁ -P ₅	P ₁	P ₅	P ₁ -P ₅
J=3	0.42	0.65	-0.23 (-1.04)	0.54	0.46	0.08 (-0.6)	0.62	0.27	0.35 (-1.36)	0.71	0.2	0.51 (-5.06)
J=6	0.69	0.42	0.27 (-1.2)	0.9	0.28	0.62 (-4.3)	0.92	0.15	0.77 (-6.02)	0.93	0.19	0.74 (-6.83)
J=9	0.9	0.48	0.42 (-1.96)	1.06	0.3	0.76 (-5.27)	1.03	0.22	0.81 (-7.39)	1.03	0.28	0.75 (-8.47)
J=12	0.12	0.32	0.8 (-3.37)	1.26	0.25	1 (-7.13)	1.21	0.2	1.01 (-9.72)	1.15	0.24	0.91 (-10.13)

J=Formation Period, K= Holding Period P₁-Winners portfolio P₅-Losers portfolio P₁-P₅ - Momentum or contrarian portfolio

According to Table 3-months/3-months strategy shows contrarian profits where past period losers outperform past period winners by 0.23 percent per month. Apart from that all the other strategies reported in the Table reflect momentum profits where past period winners outperform past period losers. All these returns are statistically significant except for the 3-months/6-months, 3-months/9-months and 6-months/3-months strategies. The most successful momentum strategy selects stocks based on their returns over the past 12 months and then holds the portfolio for 9 months. This strategy yields 1.01 percent per month.

Because the bid-ask bounce and thin trading problem can attenuate the continuation effect, Table 2 reports the average returns if the portfolio formation is delayed relative to ranking by one month. For the shorter ranking and holding intervals, delaying the portfolio formation indeed increases the payoff to buying winners and selling losers. These findings are consistent with the findings of Rouwenhorst (1998) and Jegadeesh and

Titman (1993).

According to the Table all the strategies show momentum profits and except 3-months/3-months strategy all the strategies are statistically significant. When there is a time lag between the formation period and the holding period, the most successful momentum strategy selects stocks based on their returns over the past 6 months and then holds the portfolio for 12 months. This strategy yields 1.14% per month.

Table 3 documents the returns of the 3,6,9, and 12 months strategies in two sub periods as before the automation of cse activities (up to June 1997) and after the automation of cse activities. The results in the Table indicate that all the four strategies are resulting from momentum profits for both sub periods.

Except for 3-months/3-months strategy all the other strategies generate statistically significant profits. However in the first sub period momentum profits are mainly due to the fact that losers generate deep minus returns.

Table 2
Momentum and Contrarian Strategies, 1991-2005

	K=3			K=6			K=9			K=12		
	P ₁	P ₅	P ₁ -P ₅	P ₁	P ₅	P ₁ -P ₅	P ₁	P ₅	P ₁ -P ₅	P ₁	P ₅	P ₁ -P ₅
J=3	0.69	0.60	0.09 (0.23)	0.72	0.29	0.43 (3.34)	0.74	0.13	0.61 (5.85)	0.78	0.13	0.65 (6.63)
J=6	1.08	0.06	0.76 (3.70)	1.01	0.15	0.86 (5.93)	0.96	0.06	0.90 (7.15)	0.96	0.18	0.77 (7.76)
J=9	0.82	0.17	0.91 (4.47)	1.14	0.18	0.96 (6.63)	1.07	0.16	0.91 (8.63)	1.07	0.28	0.79 (9.12)
J=12	1.25	0.21	1.04 (4.73)	1.37	0.24	1.14 (4.14)	1.21	0.21	1.00 (9.93)	1.17	0.25	0.92 (10.34)

J=Formation Period, K= Holding Period P₁-Winners portfolio P₅-Losers portfolio P₁-P₅ - Momentum or contrarian portfolio

Table 03
Sub Period Returns of Momentum Portfolios,
1991-2005

This table presents average monthly returns in percentages for momentum and contrarian strategies. Portfolios are formed based on J -month lagged returns and held for K months. The values of K and J for the different strategies are indicated in the first column and second row of each column respectively. Momentum portfolios are formed after imposing a 1 month time lag between formation period and holding period. Each month t stocks are ranked in descending order on the basis of J months lagged returns and 5 equally weighted portfolios are formed. An equally weighted portfolio of stocks in the highest return portfolio is named as the winner (W) portfolio and an equally weighted portfolio of stocks in the lowest return portfolio is the loser (L) portfolio. The table shows momentum profits on sub sample basis. Total sample period is divided into two periods as before the automation of CSE activities (up to June 1997) and after the automation of CSE activities. The sample includes all the stocks in the main board and the second board of Colombo Stock Exchange excluding those has absolute return greater than 50 percent

Strategy	Portfolio	Oct 1991 to May 1997	June 1997 to June 2005
K=3,J=3	W	-0.32	1.06
	L	-0.41	0.84
	W-L	0.08 (0.29)	0.22 (0.79)
K=6,J=6	W	-0.19	1.56
	L	-0.74	0.54
	W-L	0.56 (2.45)	1.02 (5.26)
K=9,J=9	W	0.09	1.50
	L	-0.64	0.53
	W-L	0.73 (5.26)	0.96 (6.26)
K=12,J=12	W	0.08	1.58
	L	-0.73	0.59
	W-L	0.81 (6.44)	0.99 (7.67)

Contrast to that in the second sub sample (after the automation) momentum profits are mainly due to the fact that winners generate positively high returns and in this period losers are also

positive. This contradictory return behavior over the two sub sample periods may be due to the trading inefficiency before the automation of CSE and trading efficiency after the automation of the CSE. However these momentum profits in the both periods prove the pervasive character of the momentum profits in the CSE.

5. Conclusion

Average stock returns are related to past performance and consequently cross-section of stock returns is predictable on past returns. Number of past researchers has reported that

past winners outperform past losers also in the subsequent period not only in the US market. Momentum and contrarian strategies have become as most popular investment strategies in the last decade. However there is no enough evidence found in the developing markets.

This study extends research on intermediate horizon momentum strategies. The sample period covers nearly 15 years from October 1991 to June 2005. The sample of the study includes all the voting stocks in the main board and the second board of the CSE. The results reveal that intermediate period momentum strategies are profitable in the CSE. Momentum profits are highly significant and larger when there is one month time lag between portfolio formation period and holding period. Sub sample results indicate that momentum profits are steeper after the automation of the CSE activities. This may be due to

the operating efficiencies of the activities in the CSE. Both sub periods momentum profits indicate that momentum strategies are continuously profitable in the CSE.

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