Research

CAN MOMENTUM PORTFOLIOS EARN MORE IN THE KARACHI STOCK EXCHANGE?

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Abstract

In this study, we attempt to show empirical evidence of momentum profits in Karachi Stock Exchange (KSE) using monthly stocks returns data of 609 stocks over the period June 2004 to March 2014. Using Jegadeesh and Titman (1993) methodology, we find that investors can earn positive returns by holding a zero-investment momentum portfolio i.e. buying past winners stocks and selling past losers stocks. These results are robust to excluding small stocks (share price< PKR 5) as well as to using different sample periods. Further research in this area might consider factors such as risk, size, liquidity, book-to-market value, transaction costs, and trading volume to see which of these factors can explain momentum profits in KSE.

Keywords: Momentum Returns, Pakistan, Winners and Losers, Mean Reversion

JEL Classification: G 100

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Introduction

Modern financial theory suggests efficiency of markets and presumes that assets prices exhibit random walk and are unpredictable (Mandelbrot, 1966; Samuelson, 1965). However, evidences against the random walk hypothesis are also documented (Fama and Blume, 1966; Fama, Fisher, Jensen, and Roll, 1969; Jensen, 1986; Jensen, and Bennington, 1970; and Owen, 1986). Opponents of the efficient market hypothesis believe that smart investors can earn excess risk adjusted returns. Young (1971) found that monthly returns are negatively auto-correlated which exemplifies the non-random pattern in stock returns where the negative sign indicates price reversal pattern. On the other hand efficient market hypothesis postulates that current assets' prices are fully based on all available information which are unpredictable. Given that, individual stocks and whole market could follow any direction therefore, neither technician[3] nor fundamentalists[4] could beat the market (see e.g., Fama, 1970; Samuelson, 1965). However, the market efficiency proposition was opposed by others on the basis of empirical evidences by showing that prices are predictable in many manners including the momentum (see for further details Mackinlay, 1999). It is documented that over a short period of time (daily, weekly and monthly) securities' and market returns are serially positively auto-correlated, in addition, others have documented that over long period of time (three and above years) returns show negative correlation (see e.g., Fama and French, 1988; Poterba and Summers, 1988). Moreover, it is argued that these predictable patterns could help investors to accumulate higher than normal expected returns regardless of the issue whether the predictability exists due to as explained[5] by the loyalists, revisionists and/ or heretics. Moreover all of the three views as explained by Boudoukh, Richardson, and Whitelaw (1994) in their study that markets are inefficient, or risk premium are unstable and helps in returns predictability, or that bubbles, fads, and overreaction

3-Technical analysts believe in the presence of useable patterns in the asset past prices for the future profitable investment

4-Fundamental analysts investigate business fundamentals e.g., earnings, dividends, future prospects and the like to make profitable investment decisions.

5- See for more details Boudoukh, Richardson, and Whitelaw (1994)

account for returns predictability could be argued to exist in the peculiar Pakistani stock market. Investors' response to information could be either in form of over -or under-reaction due to investors' human limitations or investors limited focus and interest in certain market and assets (Barberis, Shleifer and Vishny, 1998). When investors behave in relatively more optimistic manner to certain positive information, say for example expected innovative product development by a firm, and then they become willing to offer increased buying prices which depict their overreaction; however the increased prices might settle down at required or correct level progressively. In the case of under reaction, after the initial prices hike due to positive information prices continue to rise to reach to its fair level.

In the real world sources of information are not the same for the different investors and hence their reactions to information vary due to differences in time to behave and nature or degree of intensity of behaviors. Moreover, investors only partially accommodate new information in order to display their anchoring and adjustment behavior. In contrast to momentum strategy, contrarian strategy postulates that the past losers will be the future winners and thus suggests taking long position on poor performing stocks and short on positive performing stocks. The empirical evidences confirming the positive outcome of the contrarian strategy signifies the existence of investors' overreaction.

DeBondt and Thaler (1985, 1987) showed that long-term past winners (three- to five-years) were outperformed by long-term past losers over the next three to five years. Interestingly, return reversal for shorter periods of one week to one month are also reported in some studies (see e.g., Jegadeesh, 1990; Lehmann, 1990). Opposite to these findings, Jegadeesh and Titman (1993) reported that over investment horizon of three- to- twelve months, firms with lower past returns continue to be outperformed by firms with higher past returns over the same period. This behavior of stock returns is known as momentum and investor try to exploit this characteristic of stock prices and by selling past losers and buying past winners. Rouwenhorst (1998) used data on one dozen European stock markets and found the evidence to support the momentum strategy both in the individual and cross-country cases. However, Liu and Lee (2001) investigated Japanese (Tokoyo) stock market and concluded that over medium

term horizon (3 to 12 months) momentum strategy fail to earn relatively higher returns, in fact, they documented that momentum generated portfolios lost about 0.5% per month over the next equal period.

This study in the Karachi Stock Exchange (KSE), which is the largest stock market of Pakistan, is an endeavor to add and contribute to the scanty investigated area in Pakistan. The capital market in Pakistan has some unique characteristics. History of KSE with regards to returns and trading activities is full of surprises. These and other reasons suggest that Pakistani stock market also depart from the perfect market and/ or efficient market presumption as is the case of stock markets of many developing countries. This study specifically explores the objective to search for empirical evidence of the existence of momentum strategy in the KSE. The results of the study are expected to have influential impact on the investors' decision making behavior in KSE and have implications in general on investment decisions, risk management techniques, and could influence assets' valuation.

The following text Section 2, briefly describes the literature and, Section 3, explains the data, sample and methods of analysis. Section 4, discusses the results and Section 5 concludes the study.

Literature Review

Malkiel (2008) documented several empirical glimpses to provide valid reason to oppose the notion of market efficiency. He stated that patterns and anomalies in the capital assets' market exist and that these can be exploited to earn excess risk-adjusted returns. Boudoukh, Richardson, and Whitelaw (1994) summarized three different views about stock returns predictability by three different groups so called loyalists, revisionists and Heretics. Loyalists believe that stocks markets are inefficient; revisionists argue that risk premium of small firms stocks vary and due to this returns become predictable; and heretics believe that price bubbles, overreaction and market fads are responsible for the predictable nature of stocks returns.

Several studies have provided evidences that daily, weekly, and monthly average stocks' and market returns tend to exhibit positive

serial autocorrelation or the existence of short-run momentum in markets. For monthly returns differences Lo and Mackinley (1999) evidenced that the unit root variance is linear and exhibited a pattern. They reported that log variances of weekly prices were one fourth of the variances of monthly prices, but this pattern was not present in the stocks which were rarely traded. This suggests that this momentum pattern could be used in the evaluation of the stock prices. However the transactions costs are needed to be considered as the frequency of trading can increase these. It can also be argued that small investors in fact will face higher transaction costs due to increased frequency in the trading if they accommodate momentums into their investment decisions. Malkiel (2008) stated that momentum might not be profitable but suggest that capital markets are inefficient.

Lakonishok, Shleifer, and Vishny (1994) stated that under reaction give rise to momentum strategy as in this case, for a short while, investors' anchoring behavior generates positive autocorrelations of returns. Fama (1998) stated that like under reaction behavior, overreaction towards stock prices due to information availability also exist. Lakonishok, Shleifer, and Vishny (1994) argued that when similar type of news over a longer period of time, perhaps three to five years, consistently appear then investors start overreacting to the stock prices. Daniel, Hirshleifer, and Jegadeesh and Titman (1994) determined that not the investors' delayed response but their over reactions to news make stocks returns predictable. Inconsistent with the prevailing economic state, the evidences of negative autocorrelations (three to five years; monthly; and weekly horizons) as documented by DeBondt and Thaler (1985 &1987), Jegadeesh (1990), and Lehmann (1990) etc is contributed to investors' overreaction by Cooper (1999). Daniel, Hirshleifer, and Subrahmanyam (1998, 2001) argued that knowledge of private information cause investors to overreact and change book-to-market ratio but in the long run reversal to mean also occur. The investors' characteristic self attribution maintains the overreaction they believe that successes are due to their efforts and failures are due to extraneous factors.

Thus momentum in stocks returns is generated. However in the long-run stock prices adjust to its fundamentals due to Bayesian updating by agents. Another explanation of overreaction is put forward by Barberis, Shleifer, and Vishny (1998), according to their view investors extrapolate small sample results to large sets of random cases and then lead to reversals. It is further added that conservatism results in underreaction and cause momentum. Hong and Stein (1999) stated that slow information diffusion is the cause of momentum and feedback traders create overreaction and buy more as they make decisions on the basis of past returns believing that if the past momentum traders have made use of news later on when positions are reversed causes momentum. The use of simplistic models and ignoring other information in the analysis of stocks generate bubbles and momentum (Hong, Kubik, and Stein, 2005). They added that continuous use of a single model with consistent positive expected returns could induce investors to overreact to changes in the forecasts. However according to Gutierrez and Kelley (2006) the illiquidity reason is the plausible explanation for the negative serial autocorrelation.

Fama and French (1988) contrary to the shorter holding periods, for longer investment horizons documented the pattern of negative autocorrelation in the average returns of stocks. They showed that 25% to 40% variation in returns in attributable to serial negative autocorrelation. Poterba and Summers (1988) also documented the mean reversion phenomenon in the stock returns and it is explained that investors sentiments and changes in them generate kinds of swings in the assets' prices (DeBondt and Thaler, 1985). The stocks mean reversion phenomenon translates into investment strategy so called contrarian strategy. According to this strategy investors shall buy stocks which are poorly performing for a while and sell those performing better for a while. Interestingly market efficiency can also produce mean reversion for example volatility in the interest rates which can cause flight in and out of capital from the stock market (Malkiel, 2008). Fluck, Malkiel, and Quandt (1997) tested the contrarian strategy but could not support the view if the strategy could earn

relatively more profits. They found that stocks with poor returns history earned more than stocks with good returns history in the following period but in the next period average returns for both groups were similar.

Some authors have explained that the probable reason of the resultant abnormal returns associated with the momentum or mean reversal phenomenon could be the underlying risks and if the risk/s is/are accounted for then these returns might no more be observable. Jegadeesh and Titman (1993) analyzed momentum returns but found no evidence of the notion that systematic risk could explain them. Fama and French (1996) employed their three factor model and reported that momentum returns were independent of the three factors (systematic risk, size, and book-to-market).

Griffin, Ji and Martin (2003) tried to explain momentum returns with the help of macroeconomic factors but they found no evidence to support this view.

Shiller (1984) view could be another reason of the momentum returns. He argued that social norms and attitudes guide investors. He explained that along with the risk, investors are incompetent and are liable to be influenced socially and ultimately could make erroneous judgments. Hence this aspect of the investors' psychology can affect the whole market.

Naranjo and Porter (2007) suggested that momentum strategy works better for managers who tend to move with the market. It is also argued that risk averse investors are the momentum investors who react to strong trading signals.

Chan, Jegadeesh and Lakonishok (1996) found evidence in support of the view that individual hold back their responses and partially display their behaviors to new information as such they are anchored to significant events of the past. If information about expected earnings come to the market, investors under react to them

and upward movement of prices persist even after the initial prices increase; if information are happened to be negative prices of stock keep moving downward after the instant prices decrease at the appearance of these bad news.

Data and Methodology

Data for this study is acquired from the official website of the KSE on 609 stocks for the period from June 2004 to March 2014. The daily stock prices data is used to compute monthly returns. In this study momentum portfolios are formed using the methodology of Jegadeesh and Titman (1993). All stocks are ranked into deciles using their past P-month returns (P equals one, two, three up to 24 months returns) and ten portfolios are formed (portfolio number one being the lowest performer 'loser' and number ten highest past performer 'winner'). These portfolios are held for S period (S equals one, two, and three up to 24 months) where in each case P and S are equal.. Further to account for the possible bouncing effect of bid-ask and lagged reaction effect on the performance and holding period returns another set of portfolios is also constructed by skipping one month each between formation and holding periods i-e., between P & S. In the light of the momentum strategy, each month, portfolios with positive returns are bought and those with negative returns are sold out and this position is maintained for S months. The portfolios in the strategies examined are with overlapping holding periods. Overlapping periods can better account for temporal shifts in market risk as well as helps in using all available information (see Jegadeesh and Titman, 1993).

In line with the view of Zarowin (1990) that a small change in price of relatively low price stocks could be substantial in impact therefore to avoid the bias so created we form a sample by excluding stocks with price lower than PKR 5. Moreover, the year 2008 is considered abnormal as the KSE 100 index was frozen in wake of severe market crash. The KSE 100 Index was 13,666 on January 1, 2008 and reached to 15,676 on April 18, whereas it experienced a steep fall

thereafter. The Index was 5,865 on Dec 31, 2008. This fluctuation in the market could have impact on the results and therefore we also present results for different sub-periods.

For all formation and holding period portfolios, we use the ***asm***[6] Stata program, written by Shah (2014).

Results and Discussion

Table 1 shows results of portfolios formed immediately at the end of period P and Table 2 reports results when one month period is skipped between the ranking and holding periods that is post ranking portfolio formation is delayed for one month period of time. From the left, the first column shows formation and holding periods. Column 1 to 4 reports results for the periods June 2004 to March 2014, June 2004 to March 2014 excluding year 2008, June 2004 to December 2014, and January 2009 to March 2014. The three sub-columns in each of these five columns report number of observations (Obs. i.e. unit is one month) of the T-statistics and average periodic returns (Winners – Losers) for the buy and sell strategy for whole sample (All Stocks) and sample excluding stocks with price less than 5 PKR (Less small stocks). Annual returns of the most successful strategies and their associated information are reported in Table 3.

The results of Table 1 & 2 show that the sample stocks confirm existence of momentum and that the strategy to buy past winners and sell past losers is profitable. These results, in general, are consistent across the different samples and periods.

In column 1 of Table 1 & 2 we find that buy & sell strategy produced higher significant returns for all formation and holding periods. In Table 1, the most successful among the 24 strategies is 2 months formation and holding with 15.42% annual returns and 3 months formation and holding with 16.6% annual returns in case of all stocks and less small stocks, respectively. However, when we skip

6-ASM is abbreviated term for*Attaullah Shah Momentum* portfolios program.

the holding period for one month, as shown in Table 2, the most successful strategies are 2 months formation and holding with annual yield of 15.54% & 15.9% respectively.

In column 2, in immediate formation when the abnormal period (year 2008) is dropped the returns of the last five and seventh last formation and holdings period becomes insignificant in all stock case and for the last three formations and holding periods in less small stock case. Whereas in formation skipped by one month out of the 24 last nine formation and holding period returns are insignificant for all stocks and only last three formation and holding period returns are insignificant for less small stock sample. The insignificance results suggests that the buy and sell strategies at these periods do not prove profitable. In the immediate formation, the most successful strategies 3 months formation and holding period produce 14.08% and 15.8% annual returns. In the case of formation skipped for one month, the most successful buy and sell strategies are 2 months formation and holding period (14.88% & 15.9%) in both the all stock and less small stock cases.

For the sample period from June 2004 to December 2007, the 5 and 6 month formation and holding period are insignificant in all stock sample and 6 month formation and holding period in sample excluding small stock as shown in column 3 of Table 1. Similarly in Table 2, 5 month formation and holding period and 5 and 6 month formation and holding period are insignificant. The most successful strategy in this period, in the two tables is 2 month formation and holding period with annual yields 20.4%, 19.74%, 20.16%, and 19.92%.

In total of 22 different strategies, returns associated with formation and holding periods beyond 14 and 16 month in column 4 of Table 1 and 13 and 14 month in Table 2 turns insignificant or produce significantly negative returns. The most successful buy and sell strategies in these cases are 4 & 9 month formation and holding period with annual returns of 14.25%, 15.78% & 15.6%, 17.47% respectively.

The returns pattern in Table 2 'skip' relative to that in Table 1 'immediate' suggests that delaying portfolio formation for one month period of time favors the winners relative to the losers and results in overall relatively higher returns. One can infer that probably returns of portfolios revert to mean at the first month that is the month next to the ranking period. Ignoring the transaction costs, in general the results suggest that investors can earn significantly higher returns by adopting strategy to buy past good performing stocks and selling past poor performing stocks in the Karachi stock market. However, relative to individual investors, large investors are expected to earn better profits by adopting this strategy.

These results are similar to those reported by Naranjo and Porter (2007) for emerging and developed markets. They analyzed the momentum profits based on data set from 1990 to 2004 for 18 emerging markets and found that only 5 were statistically significant. They excluded from the sample stocks with market capitalization under the 25^{th} percentile of all NYSE stocks, arguing that this would avoid problems like illiquidity. However, although this exclusion criterion may be suitable for big markets, for emerging markets this screening seems to include too few stocks, creating a sample less representative with more concentration in big stocks.

Bekaert, Erb, Harvey, and Viskanta (1997) stated that past winners could not consistently over-perform in emerging stock markets, although they observed and reported that winners perform better when the investable indexes are examined. The results are also in line with those reported by Rouwenhorst (1999) that in emerging market stocks exhibit momentum. Hart, Slagter and Dijk (2002) analyzed data of 32 emerging markets to report significant momentum profits in 6 countries. In some of the sample country cases the numbers of stocks were few and inappropriate for the analysis. In the case of Brazil and Turkey contrary to expected momentum returns, the reversal phenomenon is reported by Bonomo and Dall'Agnol (2003) and Bildik and Gülay (2002) respectively. In case of Japan it is reported that past winners underperform to past losers during a holding period of up to

next two months, suggesting that momentum strategy does not perform positively in the shorter investment horizons (Chang, McLeavey, and Rhee, 1995). Similar results are reported for medium period horizon in the same market by Liu and Lee (2001).

Table – 1:

T-test of Winners minus Losers Monthly Returns

	1			2			3			4		
	June 2004 to Mar 2014			June 2004 to Mar 2014 Excluding Year 2008			June 2004 to Dec 2007			Jan 2009 Dec 2014		
Formation-Holding Periods	Obs.	ALL STOCKS Mean (Winners - Losers)	Less SMALL STCKS Mean (Winners - Losers)	Obs.	ALL STOCKS Mean (Winners - Losers)	Less SMALL STCKS Mean (Winners - Losers)	Obs.	ALL STOCKS Mean (Winners - Losers)	Less SMALL STCKS Mean (Winners - Losers)	Obs.	ALL STOCKS Mean (Winners - Losers)	Less SMALL STCKS Mean (Winners - Losers)
1	117	0.0119***	0.0127***	105	0.0114***	0.0123***	42	0.0128**	0.011*	62	0.0103*	0.013**
2	115	0.0257***	0.0263***	104	0.0228***	0.0244***	40	0.034***	0.0329***	60	0.0164**	0.0204***
3	113	0.038***	0.0415***	103	0.0352***	0.0395***	38	0.041***	0.044***	58	0.0337***	0.0387***
4	111	0.0485***	0.0516***	102	0.0433***	0.0472***	36	0.0367***	0.042***	56	0.0475***	0.0526***
5	109	0.044***	0.0504***	101	0.0407***	0.0483***	34	0.0208	0.0321*	54	0.0534***	0.058***
6	107	0.0444***	0.0487***	100	0.041***	0.0473***	32	0.0177	0.0215	52	0.0547***	0.0605***
7	105	0.0448***	0.0516***	99	0.044***	0.054***	30	0.0319***	0.0419***	50	0.057***	0.0631***
8	103	0.0555***	0.0593***	98	0.0551***	0.0631***	28	0.0541***	0.0535***	48	0.07***	0.0749***
9	101	0.0698***	0.0725***	97	0.0684***	0.0748***	26	0.0654***	0.0644***	46	0.0958***	0.1***
10	99	0.072***	0.0714***	96	0.0672***	0.0718***	24	0.0783***	0.0751***	44	0.0908***	0.0943***
11	97	0.0737***	0.0805***	95	0.0664***	0.077***	22	0.0825***	0.0937***	42	0.0942***	0.105***
12	95	0.0766***	0.089***	94	0.0672***	0.0825***	20	0.0929***	0.0977***	40	0.0912***	0.116***
13	93	0.0783***	0.0883***	93	0.0646***	0.0774***				38	0.0851***	0.0976***
14	91	0.0766***	0.0972***	91	0.0548***	0.0783***				36	0.0641**	0.0919***
15	89	0.074***	0.0993***	89	0.0425***	0.0703***				34	0.0253	0.0693**
16	87	0.0725***	0.118***	87	0.0297**	0.0789***				32	-0.0138	0.0813**
17	85	0.0743***	0.115***	85	0.025*	0.07***				30	-0.0431	0.0466
18	83	0.0761***	0.113***	83	0.021	0.0635***				28	-0.0601	-0.00599
19	81	0.0849***	0.114***	81	0.028*	0.0596***				26	-0.0496	0.0104
20	79	0.086***	0.117***	79	0.0194	0.053***				24	-0.0708	-0.017
21	77	0.092***	0.128***	77	0.0173	0.049**				22	-0.0948*	-0.00036
22	75	0.0841***	0.115***	75	0.00341	0.0335				20	-0.105*	-0.0197
23	73	0.0703***	0.105***	73	-0.0177	0.0157						
24	71	0.0728***	0.106***	71	-0.0193	0.0144						
No. of Firms		609	609		609	609		608	608		607	607
No. of Daily Returns		450314	429144		414513	394850		164855	158956		249658	235894

Columns with titles Less SMALL STOCKS exclude stocks with price below PKR 5. The portfolios are formed using past monthly returns and are held for the same number of month(s) as shown in the

column headed Formation-Holding Periods. The average periodic returns reported in columns headed as Mean (Winner-Losers) are calculated by subtracting average periodic returns of loser portfolio from the average periodic returns of winner portfolios. Marks ***, ** and, * shows significant at 1%, 5% and, at 10%.

Table – 2:

T-test of Winners minus Losers Monthly Returns – Holding Period Portfolio Formation Delayed by One Month

Formation-Holding Periods (in months)	1 June 2004 to Mar 2014			2 June 2004 to Mar 2014 Less Year 2008			3 June 2004 to Dec 2007			4 June 2009 to Mar 2014		
	Obs.	ALL STOCKS Mean (Winners-Losers)	Less SMALL STCKS Mean (Winners-Losers)	Obs.	ALL STOCKS Mean (Winners-Losers)	Less SMALL STCKS Mean (Winners-Losers)	Obs.	ALL STOCKS Mean (Winners-Losers)	Less SMALL STCKS Mean (Winners-Losers)	Obs.	ALL STOCKS Mean (Winners-Losers)	Less SMALL STCKS Mean (Winners-Losers)
1	116	0.012***	0.0124***	104	0.0117***	0.0129***	41	0.0146**	0.0151**	61	0.00979***	0.011***
2	114	0.0259***	0.0265***	103	0.0248***	0.0265***	39	0.0336***	0.0332***	59	0.0201***	0.0232***
3	112	0.0375***	0.0378***	102	0.0334***	0.0356***	37	0.0291**	0.0326**	57	0.0383***	0.0402***
4	110	0.0366***	0.0395***	101	0.0338***	0.0369***	35	0.0204*	0.0266*	55	0.0407***	0.0436***
5	108	0.0352***	0.0408***	100	0.0346***	0.04***	33	0.00775	0.0177	53	0.0481***	0.0512***
6	106	0.0335***	0.038***	99	0.0337***	0.04***	31	0.0104	0.0138	51	0.0467***	0.0544***
7	104	0.0392***	0.0445***	98	0.0398***	0.0478***	29	0.0292***	0.0369***	49	0.0526***	0.0589***
8	102	0.0546***	0.0574***	97	0.0553***	0.0614***	27	0.0551***	0.0547***	47	0.0745***	0.0788***
9	100	0.0646***	0.0658***	**96**	0.0642***	0.0677***	25	0.0696***	0.0691***	45	0.0877***	0.0912***
10	98	0.0685***	0.0681***	95	0.0642***	0.0676***	23	0.087***	0.082***	43	0.0857***	0.0919***
11	96	0.0681***	0.0758***	94	0.0637***	0.073***	21	0.0792***	0.0888***	41	0.0879***	0.103***
12	94	0.0694***	0.081***	93	0.0598***	0.0723***	19	0.0925***	0.0983***	39	0.0795***	0.104***
13	**92**	0.0751***	0.0862***	92	0.0599***	0.0729***				37	0.076***	0.0886***
14	90	0.0712***	0.0945***	90	0.0466***	0.0711***				35	0.0425	0.0744***
15	88	0.0662***	0.0927***	88	0.0343***	0.0619***				33	-0.0026 7	0.0438
16	86	0.0623***	0.107***	86	0.0198	0.0674***				31	-0.0442	0.0497
17	84	0.0638***	0.108***	84	0.0155	0.0622***				29	-0.0768**	0.0249
18	82	0.0689***	0.106***	82	0.0172	0.0578***				27	-0.0786**	-0.0205
19	80	0.0799***	0.108***	80	0.0221	0.0519***				25	-0.0668	-0.00796
20	78	0.0807***	0.111***	78	0.013	0.0455**				23	-0.0901*	-0.0272
21	76	0.085***	0.124***	76	0.011	0.0444**				21	-0.111**	-0.00733
22	74	0.0792***	0.103***	74	0.00011	0.0227				19	-0.119*	-0.0528
23	72	0.061***	0.0969***	72	-0.0244	0.00976				17	-0.21***	-0.11*
24	70	0.0722***	0.108***	70	-0.0181	0.0205				15	-0.182***	-0.122***
No. of Firms		609	609		609	609		608	608		607	607
No. of Daily Returns		450314	429144		414513	394850		164855	158956		249658	235894

The table is similar to Table-1 however the portfolios based on past monthly returns are formed after one month of these returns. Marks ***, ** and, * shows significant at 1%, 5% and, at 10%.

Table-3:

Results Summary

Highest annual returns cases across the different periods, different formation and holding periods, and full sample and sample excluding small stocks with number of observations and level of significance are reported.

Sample Period		June 2004 to Mar 2014	June 2004 to Mar 2014 (less Year 2008)	June 2004 to Dec 2007	Jan 2009 to Mar 14
All Stocks	Formation-Holding Period (months)	2	3	2	4
	Annual Returns in %	15.42***	14.08***	20.4***	14.25***
	No. of Obsn.	115	103	40	56
All Less Small Stocks (Share Price <5)	Formation-Holding Period (months)	3	3	2	4
	Annual Returns in %	16.6***	15.8***	19.74***	15.78***
	No. of Obsn.	113	103	40	56
Holding Period Portfolio Formation Delayed One Month					
All Stocks	Formation-Holding Period (months)	2	2	2	3
	Annual Returns in %	15.54***	14.88***	20.16***	15.32***
	No. of Obsn.	114	103	39	57
All Less Small Stocks (Share Price <5)	Formation-Holding Period (months)	2	2	2	3
	Annual Returns in %	15.9***	15.9***	19.92***	16.08***
	No. of Obsn.	114	103	39	57

Conclusions

This study attempted to show empirical incidence of the existence of momentum pattern in KSE. The results suggest that, as in the case of most of the developing countries, returns exhibit statistically significant time-series pattern. The results indicate that momentum in stock returns exists up to 24 months in KSE; however, month on month incremental returns decreases in many cases after a given month.

Further research in this area is required and it is suggested that factors such as risk, size, liquidity, trading volume, and book-to-market value are considered to investigate which of these factors can

explain momentum profits in KSE. More importantly transaction costs need to be accounted for to see whether momentum strategy remain profitable after adjusting for such costs.

References

Andy, C. W., Titman, S., and John Wei, K. C. (2000). "Momentum, Legal Systems and Ownership Structure: An Analysis of Asian Stock Market", Working paper, University of Texas.

Barberis, N., Shleifer, A., and Vishny, R. A. (1998) . "model of investor sentiment", *Journal of Financial Economics*, 49, pp. 307–343.

Bekaert, G. Erb, C. Harvey, C. and Viskanta, T. (1997) . "What matters for emerging equity market investments", *Emerging markets quarterly*, summer, pp.17-46.

Bildik, R. and Guzhan Gulay, G. (2002) . "The Winners and Losers Effect: Evidence from the Istanbul Stock Exchange", EFMA 2002 London Meeting.

Bonomo, Marco and Ivana Dall'Agnol, (2003) . "Retornos Anormais e Estratégias Contrárias", *Revista Brasileira de Finanças*, 1, pp. 165-205.

Boudoukh, J., Richardson, M. and Whitelaw, R. (1994) . "A tale of three schools: Insights on autocorrelations of short-horizon stock returns", *Review of Financial Studies*, 7, pp.539-573.

Chan, Louis K.C, Jegadeesh, N. and Lakonishok, J. (1996) . "Momentum strategies", *Journal of Finance*, 51, pp.1681-1713.

Chang, R., McLeavey, D., and Rhee, S. (1995) . "Short-term abnormal returns of the contrarian strategy in the Japanese Stock Market", *Journal of Business Finance Account*. 22 (7), pp.1035–1048.

Chui, Andy C. W., Titman, S. and John Wei, K. C. (2003) . "Momentum, Legal Systems and Ownership Structure: An Analysis of Asian Stock Market", Working paper, University of Texas.

Daniel, K. D., Hirshleifer, D., and Subrahmanyam, A. (1998) . "Investor psychology and security market under and over-reactions", *Journal of Finance*, 53, pp. 1839-1886.

Daniel, K. D., Hirshleifer, D., and Subrahmanyam, A. (2001) . "Overconfidence, arbitrage and equilibrium asset pricing", *Journal of Finance*, 56, pp. 921–65.

DeBondt, W. and Thaler, R. (1985) . "Does the stock market overreact?", *Journal of Finance*, 40, 793–805.

DeBondt, W. and Thaler, R. (1987) . "Further evidence on investor overreaction and stock market Seasonality", *Journal of Finance,* 42, 557–581.

Fama, E. F. (1970) . "Efficient capital markets: A review of theory and empirical work", *Journal of Finance*, 25: 383–417.

Fama, E. F., and Blume, M. (1966) . "Filter Rules and Stock Market Trading Profits", *Journal of Business (Special Supplement),* pp. 226-241.

Fama, E. F., and French, K. R. (1988) . "Permanent and temporary components of stock prices", *Journal of Political Economy,* 96:246–73.

Fama, E. F., and French, K. R. (1998) . "Business Conditions and Expected Returns on Stocks and Bonds", *Journal of Financial Economics*, 25, pp. 23-50.

Fama, E. F., Fisher, L., Jensen, M. C., and Roll, R. (1969) . "The Adjustment of Stock Prices to New Information", *International Economic Review,* pp. 1-21.

Fama, E.F., and French, K. R. (1992) . "The cross-section of expected stock returns, *Journal of Finance*

Fluck, Z. Malkiel, B. G., and Quandt, R. E. (1997) . "The predictability of stock returns: A cross-sectional simulation", *Review of Economics and Statistics*, 79: 176–83.

Griffin, Ji, and Martin (2003) . "For a study of momentum around the world Market states and momentum, *Journal of Finance,*

Gutierrez, R. C., and Kelley, E. K. (2006) . "Evidence to the contrary: weekly returns have momentum", *Working Paper,* University of Oregon.

Hart, J. V. Slagter, E. and Dijk, D.V. (2002) . "Stock selection strategies in emerging markets", *Journal of Empirical Finance*, pp. 194-213.

Hong, H., and Stein, J. C. (1999). "A unified theory of underreaction, momentum trading and overreaction in asset markets", *Journal of Finance*, 54, pp. 2143–2184.

Hong, H., Kubik, J., and Stein, J. C. (2005). "Thy neighbor's portfolio: Word-of-mouth effects in the holdings and trades of money managers", *Journal of Finance*, 60, pp. 2801–24.

Jegadeesh, N. (1990). "Evidence of predictable behavior of security returns", *Journal of Finance*, 45, pp. 881–98.

Jegadeesh, N. and Titman, S. (1993) . "Returns to buying winners and selling losers: Implications for stock market efficiency", *Journal of Finance*, 48, pp.65–91.

Jegadeesh, N. and Titman, S. (2001). "Profitability of momentum strategies: An evaluation of alternative explanations", *Journal of Finance*. 56, 699-720.

Jegadeesh, N., and Titman, S. (1994). "Overreaction, delayed reaction, and contrarian profits", University of Illinois at Urbana Champaign, Working paper.

Jegadeesh, N., and Titman, S. (1995). "Overreaction, delayed reaction, and contrarian profits", *Review of Financial Studies*, 8, 973–993.

Jensen, M. C. (1986) . "The Performance of Mutual Funds in the Period 1945-1964", *Journal of Finance*, pp. 389-416.

Jensen, M. C., and Bennington, G. A. (1970) . "Random Walks and Technical Theories: Some Additional Evidence", *Journal of Finance*, pp. 469-482.

Lakonishok, J., Shleifer, R. and Vishny, R. (1994) . "Contrarian investment, extrapolation, and risk", *Journal of Finance*, 49, pp.1541-1578.

Lehmann, B. N. (1990). "Fads, martingales and market efficiency", *Quarterly Journal of Economics*, 105, pp. 1–28.

Liu, C. and Lee, Y. (2001). "Does the Momentum Strategy Work Universally? Evidence from the Japanese Stock Market", *Journal of Asia-Pacific Financial Markets*, 8, pp. 321-339.

Lo, A. W., and MacKinlay, A. C. (1990) . "When are contrarian profits due to stock market-overreaction?", *Review of Financial Studies*, 3, 175–208.

Lo, A. W., and MacKinlay, A. C. (1999) . *"A Non-random Walk Down Wall Stree"*, Princeton University Press, Princeton, NJ.

Malkiel, G. B. (2008). "Stock Market Predictability", *International Encyclopedia of the social and Behavioral Sciences*, pp. 15126-15133.

Mandelbrot, B. (1966). "Forecasts of Future Prices, Unbiased Markets, and Martingale Models." *Journal of Business (Special Supplement)*, pp. 242-255.

McQueen, G., Pinegar, M., and Thorley, S. (1996) . "Delayed Reaction to Good News and the Cross-Autocorrelation of Portfolio Returns", *The Journal of Finance, Vol. 51(3)*, Papers and Proceedings of the Fifty-Sixth Annual Meeting of the American Finance Association, San Francisco, California, January 5-7, 1996, pp. 889-919.

Naranjo, A. and Porter, B. (2007) . "Including emerging markets in international momentum investment strategies", *Emerging Markets Review*, 8, pp. 147-166.

Owen, J. (1986). "Analysis of Variance Tests for Local Trends in the Standard and Pdofs Index" *Journal of Finance*, pp. 509-514.

Poterba, J. M., and Summers, L. H. (1988). "Meanreversion in stock returns: Evidence and implications", *Journal of Financial Economics*, 22: 27–59.

Rouwenhorst, K. (1998) . "International momentum strategies", *Journal of Finance*, 53, 267–284.

Samuelson, P. A. (1965) . "Proof That Properly Anticipated Prices Fluctuate Randomly", *Industrial Management Review*, 6, pp. 41-49.

Shah, Attaullah (2014). "Stata Program for Momentum J-K Portfolios", Working Paper.

Shiller, R. J. (1984). "Stock prices and social dynamics", *Brookings Papers on Economic*, 457–510.

Young, W. E. (1971). "Random Walk of Stock Prices: A Test of the Variance-Time Function", *Econometrica*, pp. 797-812.

Zarowin, P. (1990). "Size, seasonality, and stock market overreaction", *Journal of Financial and Quantitative Analysis*, 25, pp. 113_125.