

# **Momentum Effect: Empirical Evidence from Karachi Stock Exchange**

**By**

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## **Abstract:**

*The objective of this study is to analyze the momentum effect in Karachi Stock Exchange. The study constructed 16 momentum strategies by following equal weighted, full rebalancing and Decile techniques. We used stock prices of 300 companies listed on Karachi Stock Exchange from 1999 to 2007. The Returns of zero-cost momentum portfolio were positive only in 1 out of 16 strategies; and a decreasing trend in losses reported in 15 strategies was observed, so analysis was extended to Long Period Analysis”, Here we find some evidence of momentum effect which remained significant even after changing the sample. The evidence of momentum effect in Karachi stock exchange an emerging market stands distinct in the literature.*

**Key Words:** Momentum effect, Stock Returns, Zero-cost momentum portfolio, Winner stock, loser stock.

## 1. Introduction

Capital market efficiency and the prediction of future stock prices are the most thought-provoking and ferociously debated areas in finance. The followers of traditional financial theory strongly believe that the markets are efficient in pricing the financial instruments. This view became popular after Fama's work on the Efficient Market Hypothesis. But before 1990's, wide-ranging financial literature documented that stock prices, to some extent, are predictable. Many psychologists, economist and the journalists are of the view that general tendency of individuals is to overreact to the information. De Bondt and Thelar (1985) studies this view of experimental psychology that whether such behavior matters at the market level or not. They found out that stock prices will overreact to information, and suggested that contrarian strategies buy the past losers and sell the past winners, earn abnormal returns. They extended the holding period from 3 to 5 years and provide the evidence of long term returns reversal. Jegadeesh (1990) and Lehmann (1990) supported the evidence of return reversal in short term, i.e. from one week to one month. They suggested that the contrarian strategies having holding period of one week to one month earned the significant abnormal return. Lo and Mac Kinalay (1990) objected on the ground that a major portion of this abnormal return, reported by Jegadeesh (1990) & Lehmann (1990), is due to the delayed reaction of stock prices to common factors rather than to overreaction. Some other researchers pointed out some other reasons of this abnormal stock returns i.e. short-term pressure on stock prices and absence of liquidity in the market rather than overreaction.

Despite of this literature on contrarian strategies, the early literature on market efficiency emphasized on the relative strength strategy, buy past winner and sell past looser. Levy (1967) worked on relative strength strategy and reported that the stock with its current price substantially higher than average prices of last twenty seven weeks will earns abnormal returns. As concern to the practice, a large number of practitioners still apply relative strength rule for stock trading. Grinblat (1989) and Titman (1991) analyzed the sample of mutual fund and found that mutual funds have a tendency to buy the stock that has shown an increase in its price over last quarter. Copeland and Mayers (1982) and Stikle (1985) also suggested the abnormal returns realized by the relative strength strategy. Jegadeesh & Titman (1993) analyzed this contradiction

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between practitioners and academic literature and pointed out some possibilities. One possibility is that the abnormal returns earned by practitioners are fake or un-correlated to their tendency towards the buying past winners. Second possibility is the difference of time period used in both analyses. Contrarian strategies used the trading strategies either based on very long holding period, 3 to 5 years, or very short period, one week to one month. However, time period used in the case of abnormal return realized by practitioners is three months to twelve months. Then Jegadeesh & Titman (1993) documented this strategy and found momentum effect in American Financial Markets by considering 16 medium temporal horizons. As this was a very serious question on the market efficiency hypothesis. Some researchers objected this empirical statement of momentum effect and refer it to snooping data. G.W. Schwert (2002) reported the momentum effect as temporary phenomena and it should disappear as it becomes visible to the investor's community.

As I tested the momentum effect on the stock returns of companies listed on Karachi Stock Exchange, cultural and institutional differences were expected to affect the results as compared to the western countries. Hofstede (1999) analyzed that Asians tend to score low in "individualism" test as compared to the western countries test takers. Individualism hasn't any direct relationship with the momentum effect but it relates to "overconfidence" and "conservatism". Danial, H and Subrahmanyam (1998) and Barbris, Shlifer, and Vishny (1998) suggested that the "overconfidence" and "conservatism" are the determinants of relative strength/momentum strategies.

In 2000, Chui, Titman, and Wei were the first to analyze the momentum effect on the Eight Asian Stock market's return from 1976 to 2000. They constructed 6-6 months value weighted strategy, in which winners and losers stocks were ranked as top and bottom 30% respectively. They reported very low momentum effect in Asian markets (Sig only in Hong Kong), except Indonesia and Korea. I expected no momentum effect or very low, if and statistically insignificant.

## 2. Literature Review

Jegadeesh & Titman (1993) conducted the study by analyzing the AMEX & NYSE stocks from 1965 to 1989. They formed 32 strategies with the formation and holding period from 3 months to 12 months (with and without one week gap in formation and holding periods). They reported the positive returns against each 32 zero-cost momentum portfolio. All of these returns were statistically significant except 3/3 months strategy (The strategy with 3 months formation period as well as 3 months holding period). They reported the momentum effect in American Stock's markets with average monthly return of 1 %. Further, they reported that these average returns of these portfolios are not due to their idiosyncratic risk or delayed reaction of stock prices to common factors. They reported average monthly returns of 0.095 (t-statistics .0307) in 6/6 strategy.

Conrad and Kaul (1998) changed the time period and investigated the momentum effect in American Stock's markets from 1962 to 1989. Further, they decreased the strategies from 3-12 months to 1-36 weeks (where one week is the formation period and 36 weeks were the holding period). They reported the positive returns of zero-cost momentum portfolio with statistically significance, except 1-1 week. So, they confirmed the momentum effect documented by Jegadeesh and Titman (1993).

Chan, Jegadeesh & Lakonishok, J. (1996) used the primarily listed stock on the NYSE, NASDAQ & AMEX but they used only 6-month/6-months strategy, the most representative strategy. They reported the zero-cost momentum return of 0.088 over the first two quarters and the return was not less than 0.154 over the first four quarters. But, these returns were -0.06 and 0.012 respectively in the year two and three, following the date of formation. These results are consistent with the above discussion by JT (1993) on the contradiction between practitioners and the proponents of contrarian strategy.

Lee and Swaminathan (2000) objected on the study conducted by Chan, Jegadeesh & Lakonishok, J. (1996, 1999) keeping in view the Fama and French three factor model. They were of the view that NASDAQ should be excluded from the analysis because NASDAQ firm

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are smaller and it is more difficult to involve in the trading of relative strength strategies. Then, they conducted the study on the data from 1965 to 1995 using all listed firms of NYSE and AMEX. They constructed 16 different strategies, i.e. 3-3, 3-6, 3-9, 3-12; 6-3, 6-6, 6-9, 6-12; 9-3, 9-6, 9-9, 9-12; 12-3, 12-6, 12-9, 12-12; and reported positive and statistically significant returns for all of the constructed strategies. Korajczyk and Sadka (2004) also reported the momentum effect after incorporating the risk and transaction cost.

Rouwenhorst objected that all of the studies to support the momentum effect were conducted on the same data set and this effect may be due to the snoopy data. Then Rouwenhorst (1998) decided to conduct the study in an international context. He selected 2190 European companies and used the sample data ranging 1980-1995. He constructed 32 different strategies; 16 strategies without one month gap between formation period and holding period and 16 strategies with one month gap between formation period and holding period, and reported the positive and statistically significant returns from momentum portfolio. One interesting aspect of their study was that the worst and best performing portfolios were same as reported by Jegadeesh and Titman (1993). Results of remaining 16 strategies, with a gap of one month after formation period were also same as reported by the Jegadeesh and Titman (1993) in their original study on American Stock Market's returns. Further, he extended the analysis on individual countries and found a strong momentum effect in Holland, Denmark, Belgium and Spain. At the end, he also analyzed the momentum effect even after incorporating the firm's size. He also reported the reversal in second year as by JT (1993). De Bondt, S. and Weber (1998) reported the momentum effect in Frankfurt Stock Exchange (FSE) with the sample from 1961 to 1991, but they used a different methodology. They supported momentum effect by reporting the cumulative excess returns of all zero-cost momentum portfolios, where the excess return is the difference between zero-cost momentum portfolio and the index return. Dijk and Huibers (2002) examined 15 European countries by taking the sample from 1987 to 1999. They changed the formation and holding periods; Formation period was fixed by 12 months and holding period was of 1, 3, 6 and 12 months. They observed the momentum in all of the constructed strategies by reporting the positive and statistically significant results of all zero-cost momentum portfolios. Risk adjusted returns, reported by Dijk and Huibers (2002) were also positive. Rouwenhorst (1999) was against the first to investigate the emerging markets with respect to momentum effect. He

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examined the sample of 1705 companies from 20 emerging countries from 1982 to 1997. He reported the momentum effect in 17 out of 20 countries with a slightly change in methodology, i.e. ranking the stock portfolios; top 30%, middle 40%, and bottom 30%. The momentum was lower in emerging markets as compared to developed markets (Rouwenhorst, 1999; Jigadeesh and Titmann 1993).

Momentum effect was studied in American Stock Market's returns, European Stock Market's returns and in the Emerging Stock Market's returns, as discussed in above mentioned literature. Then, in 2000, Chui, Titman, and Wei were the first to analyze the momentum effect on the Eight Asian Stock market's return from 1976 to 2000. They constructed 6-6 months value weighted strategy, in which winners and losers stocks were ranked as top and bottom 30% respectively. They reported very low momentum effect in Asian markets (Sig only in Hong Kong), except Indonesia and Korea. However, a strong reversal effect was observed in the Asian Stock Market's returns. Griffin, Ji, and Martin (2003) analyzed the worldwide momentum effect by constructing 6-6 strategy and collected the data from following regions: Africa, Asia, Europe, and the United States. They found momentum effect in almost all of the studied countries of the world except the Asian countries having the weakest momentum effect. Faten Zoghلامي (2011) studies almost 100 companies listed on the Tunisian stock markets. He constructed 16 relative strength strategies and reported the average monthly return of 0.0243 in zero-cost momentum portfolio. Further he reported the effect of size and market factors on momentum profits.

As Asian markets were studied with only one strategy and the sample was upto 2000 (Chui, Titman, and Wei, 2000), we intended to focus on Karachi Stock Exchange. So, we will take a sample from Karachi Stock Exchange from 1999 to 2008. Rest of the paper is as follows; section 111 represents the methodology, section 1V presents the data analysis and discussion, and section V will show the conclusion of the study.

### 3. Methodology

In the first section, we constructed the momentum strategies and for the selection of momentum strategies, we analyzed the following techniques;

1. Weighted Relative Strength Strategy versus Decile,
2. Full versus Partial Rebalancing,
3. Equally-Weighted versus Value-Weighted Portfolio.

Further discussion on the formation and holding periods, and the methods of calculating average monthly returns in all of the constructed strategies for our analysis has been placed in last part of this section.

#### 3.1.Momentum Effect strategies construction:

In order to test the momentum effect in Pakistani Stock Market's returns, 16 momentum strategies (3-3, 3-6, 3-9, 3-12; 6-3, 6-6, 6-9, 6-12; 9-3, 9-6, 9-9, 9-12; 12-3, 12-6, 12-9, 12-12) were constructed with some special following considerations;

##### 3.1.1. Weighted Relative Strength Strategy versus Decile

For ranking stock in each portfolio (winner's portfolio, losers' portfolio and momentum portfolio), literature suggested two methods i.e. WRSS and Decile Strategy. In WRSS, stock is ranked by comparing its performance with average sample performance. Momentum Portfolio is constructed by;

Momentum Portfolio
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- |  |
|--|
| <ul style="list-style-type: none"><li>• Long position in the stock tht has performed above sample average;</li><li>• Short position in the stock tht has performed below sample average;</li></ul> |
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Weight of asset  $i$  is calculated as;

$$W_i = \pm \frac{1}{N} (R_i - AR)$$

Where: AR = the average (arithmetic mean) of returns of all of the sample,

$R_i$  = Return of the evaluated asset,

N = the number of stock in entire sample.

While in Decile strategy, stocks are ranked on the basis of their historical performance as follows;

Momentum Portfolio
<ul style="list-style-type: none"><li>• Long position in top portfolio (in decending order of all portfolios);</li><li>• Short position in bottom portfolio (in decending order of all portfolios);</li></ul>

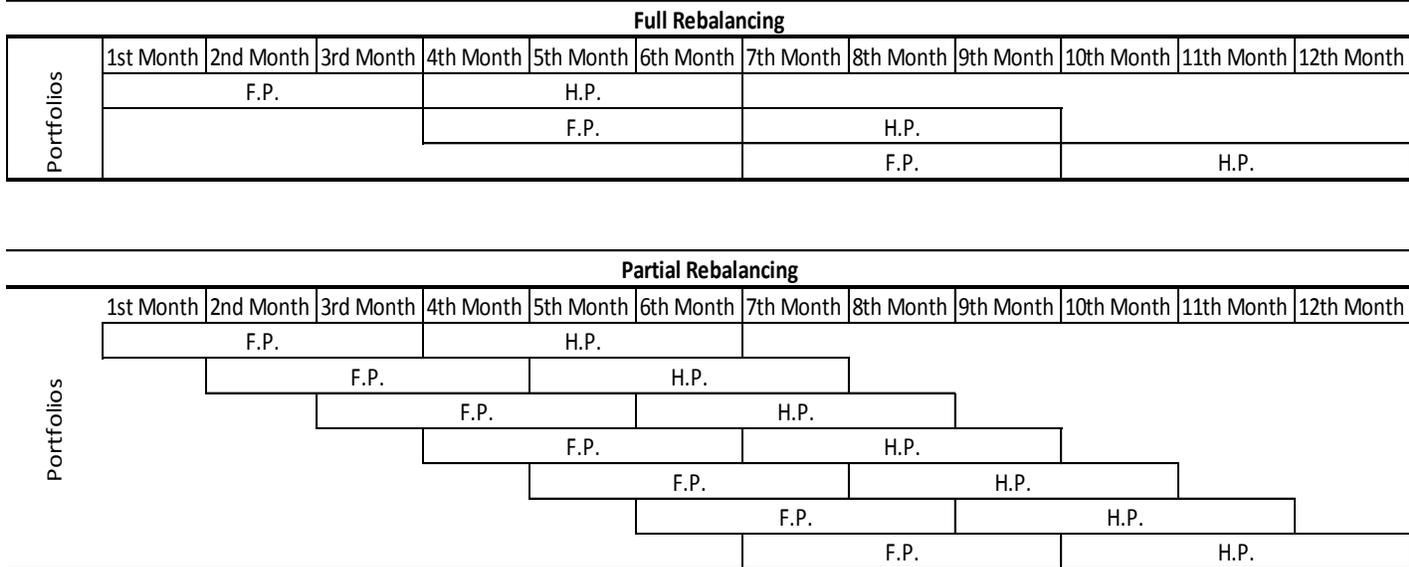
I selected the “Decile Strategy” due to one severe problem in WRSS, i.e. weighting scheme.

### 3.1.2. Full versus Partial Rebalancing

Second important consideration is to decide about rebalancing technique. In full rebalancing, each portfolio is reshaped at end of each formation/period, while partial rebalancing technique rebalances each portfolio at beginning of each months as follows;

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Figure #1



F.P. (For Formation/Period) & H.P. (For Holding/Period)

We used full rebalancing method because this method is more viable to private investor because he doesn't follow the market on monthly basis.

### 3.1.3. Equally-Weighted versus Value-Weighted Portfolio

The Next important consideration is regarding the weights assigned to each portfolio. In equally-weighted method, portfolios are constructed irrespective of the market capitalization. On the other hand, portfolios are weighted on the basis of market capitalization in value-weighted portfolio. By using the value-weighted portfolio method, it becomes very difficult to conclude that either effect is in entire sample or only in stock having large capitalization. So, we selected equally-weighted portfolio for our study.

### 3.2. Calculating the Average Monthly Returns

On the basis of these considerations, we collected monthly stock prices of the selected companies listed on Karachi Stock Exchange. we calculated the stock returns from stock prices by using continuous compounding returns;

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$$R_t = 100\% \times \ln\left(\frac{P_t}{P_{t-1}}\right)$$

We arranged the selected companies in descending order and selected top 10 and bottom 10 companies for calculating the average monthly returns. First portfolio with the stock having highest returns and last portfolio with the lowest stock return are known as Winner's stock and loser's stock in the literature as well as in our study. Next step is to construct the momentum portfolio; that is constructed on the basis of long position in winner's stock portfolio and short position in the loser's stock portfolio. Momentum effect is evaluated by calculating the average monthly returns in holding period (period starting immediately after formation period). The following 16 strategies were constructed;

Figure 2

Strategy-Wise Formation and Holding Periods	
Momentum Strategy	Respective Formation & Holding Periods
Strategy 1 (3/3)	Where: Formation Period=3 months and Holding Period=3 months
Strategy 2 (3/6)	Where: Formation Period=3 months and Holding Period=6 months
Strategy 3 (3/9)	Where: Formation Period=3 months and Holding Period=9 months
Strategy 4 (3/12)	Where: Formation Period=3 months and Holding Period=12 months
Strategy 5 (6/3)	Where: Formation Period=6 months and Holding Period=3 months
Strategy 6 (6/6)	Where: Formation Period=6 months and Holding Period=6 months
Strategy 7 (6/9)	Where: Formation Period=6 months and Holding Period=9 months
Strategy 8 (6/12)	Where: Formation Period=6 months and Holding Period=12 months
Strategy 9 (9/3)	Where: Formation Period=9 months and Holding Period=3 months
Strategy 10 (9/6)	Where: Formation Period=9 months and Holding Period=6 months
Strategy 11 (9/9)	Where: Formation Period=9 months and Holding Period=9 months
Strategy 12 (9/12)	Where: Formation Period=9 months and Holding Period=12 months
Strategy 13 (12/3)	Where: Formation Period=12 months and Holding Period=3 months
Strategy 14 (12/6)	Where: Formation Period=12 months and Holding Period=6 months
Strategy 15 (12/9)	Where: Formation Period=12 months and Holding Period=9 months
Strategy 16 (12/12)	Where: Formation Period=12 months and Holding Period=12 months

### **3.3. Other Issues in Strategies Construction**

In order to find the momentum effect in Pakistani Markets, we collected the monthly stock prices of 300 companies listed on Karachi Stock Exchange from Jan 1999 to Dec 2007. We found negative returns of zero-cost portfolio in 15 out of 16 strategies. There was a decreasing trend in momentum losses reported from zero-cost portfolio. This was a good indicator towards a very small momentum effect as reported by Griffin, Ji, and Martin (2003). They analyzed the worldwide momentum effect by constructing 6-6 strategy and collected the data from following regions: Africa, Asia, Europe, and the United States. They found momentum effect in almost all of the studied countries of the world except the Asian countries having the weakest momentum effect; aligned with Chui, Titman, and Wei (2000).

By evaluating the decreasing trend and reported results of Griffin, Ji and Martin (2003), the study extended to “Long Period Analysis”. Finally we sub divided the sample in two groups to check the momentum effect. We changed the sample after finding small evidence of momentum. Another sample of monthly stock prices of 50 companies listed on Karachi Stock Exchange was taken and analyzed the effect by taking eight most representative strategies, i.e. 6/3, 6/6, 6/9, 6/12 and 12/3, 12/6, 12/9, and 12/12.

### **3.4. Robustness Test**

The Momentum effect may be associated with the specific type of stocks on the basis of market capitalization, book to market value and trading volume. We ranked the stock with respect to market capitalization, book to market value and trading volume in case of strong momentum effect reported in Karachi Stock Exchange.

### **3.5. Risk Identification**

The Risk and return are associated with each other and we should identify the risk factors if momentum strategies reported the reasonable abnormal profit by having long position in past winners and short position in past losers in Karachi Stock Exchange. We have used CAPM and Fama and French 3 factor model to identify these risk factors.

### **4. Data Analysis and Discussion:**

This section presents the results of all 16 momentum strategies calculated from the monthly stock prices of 300 companies from 1999 to 2007. Strategies were constructed on the basis of equal weights and full re-balancing strategies. Stocks were ranked on the basis of average monthly returns of formation period and then ten companies from the top and ten from the bottom were selected as winners and losers stocks respectively. Table # 1 presents the results of the momentum strategies; where no momentum effect was supported except 12/9 strategy that allowed an average monthly return of 1.25 %, statistically significant but I can observe a decreasing trend in losses reported in zero-cost momentum portfolios (Figure # 3).

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Table # 1:

		Momentum Strategies				
		Holding Period				
		J/K	3	6	9	12
Formation Period	3	Returns-Winner's Stock	-0.1020	-0.0025	0.0004	0.0027
		Returns-Loser's Stock	*-0.8977	*-0.3818	*0.07809	*0.5547
		Returns-Momentum Portfolio	0.5861	0.0409	0.0297	0.0253
		Returns-Momentum Portfolio	3.9824	4.5245	5.1255	5.3666
	6	Returns-Winner's Stock	-0.6881	-0.0435	-0.0293	-0.0226
		Returns-Loser's Stock	-4.9578	-5.3333	-4.5974	-4.1337
		Returns-Momentum Portfolio	-0.0097	-0.0049	0.0007	0.0008
		Returns-Momentum Portfolio	*-1.0123	*-0.8268	*0.1379	*0.1689
	9	Returns-Winner's Stock	0.0540	0.0347	0.0201	0.0249
		Returns-Loser's Stock	3.4178	3.8584	4.0892	5.3828
		Returns-Momentum Portfolio	-0.0637	-0.0396	-0.0196	-0.0234
		Returns-Momentum Portfolio	-4.2193	-4.7817	-3.8900	-4.7719
12	Returns-Winner's Stock	-0.0121	-0.0127	-0.0094	0.0214	
	Returns-Loser's Stock	*-1.7845	*-1.6698	*-1.0758	2.785444	
	Returns-Momentum Portfolio	0.0838	-0.0073	0.0248	0.0399	
	Returns-Momentum Portfolio	4.6154	*-0.7221	2.1135	4.1553	
12	Returns-Winner's Stock	-0.0959	-0.0054	-0.0342	-0.0184	
	Returns-Loser's Stock	-4.8441	*-0.4212	-3.7094	-2.0648	
	Returns-Momentum Portfolio	0.0140	0.0068	0.0046	-0.0080	
	Returns-Momentum Portfolio	1.1503	*0.6581	*0.6308	*-1.0083	
12	Returns-Winner's Stock	0.0862	0.0209	-0.0079	0.0125	
	Returns-Loser's Stock	4.6791	*1.81026	*-1.4481	*1.4741	
	Returns-Momentum Portfolio	-0.0722	-0.0141	0.0125	-0.0205	
	Returns-Momentum Portfolio	-3.6203	-1.9947	*1.1687	-2.8684	

Figure 3

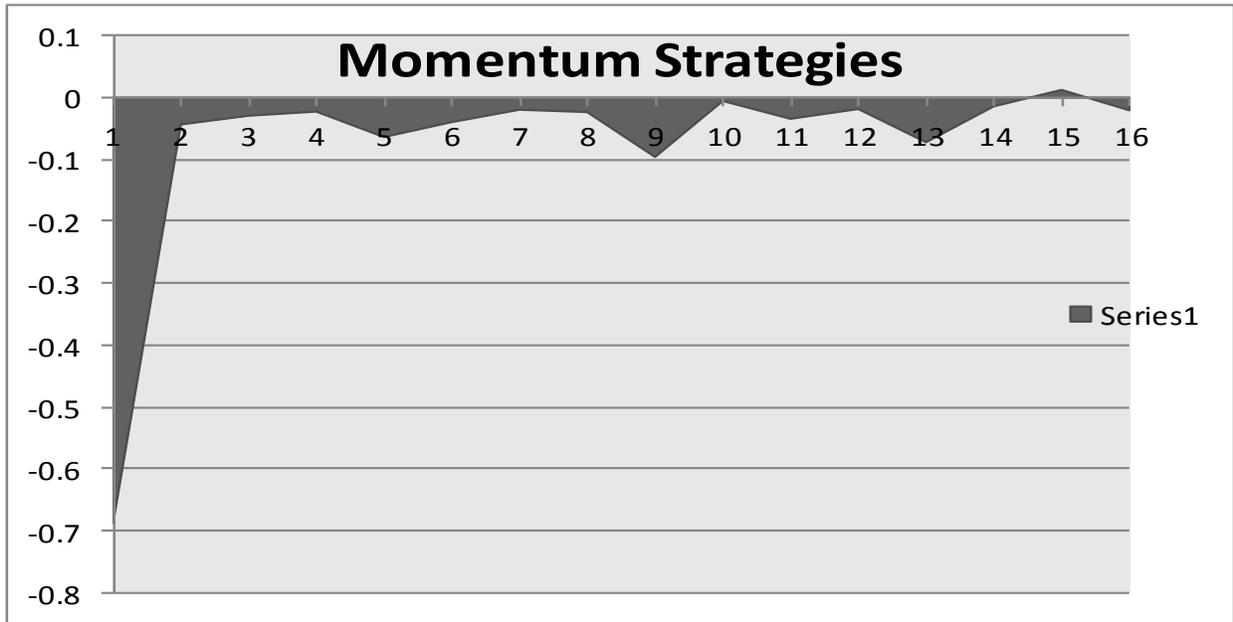


Figure 3 documented a decreasing trend except one 3/3 strategy. Very short formation with very short holding period strategies have documented abnormal results in momentum literature, i.e. one of the possibilities explained by Jegadeesh & Titman (1993) for the contrarian strategies suggested and supported by De Bondt and Thaler (1985, 1987).

This was a strong indicator towards a very slight momentum effect as reported by Griffin, Ji, and Martin (2003). They analyzed the worldwide momentum effect by constructing 6-6 strategy and collected the data from following regions: Africa, Asia, Europe, and the United States. They found momentum effect in almost all of the studied countries of the world except the Asian countries having the weakest momentum effect; aligned with Chui, Titman, and Wei (2000). So, I extended our analysis to “Long Period Holding Analysis” after observing this trend where returns tendency toward profits with long holding period.

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### 4.1. Long Holding Period Analysis:

By considering contrarian strategies (De Bondt 1985) and Chui, Titman, and Wei (2000), I extended our analysis by increasing the holding period by 24, 36 and 48 months with the formation period of 6 and 12 months as momentum was reported only in 1 out of 16 momentum

strategies, i.e. 12/9. Table # 2 presents the results of long in winners' stock, short in loser's stock and zero cost portfolio returns respectively.

Table # 2:

		Momentum Strategies			
		Holding Period			
		J/K	24	36	48
Formation Period	6	Returns-Winner's Stock	0.0037	0.0091	0.0120
		Returns-Loser's Stock	*1.1911	3.5645	8.7187
		Returns-Momentum Portfolio	0.0186	0.0156	0.0199
		Returns-Momentum Portfolio	5.1525	3.9694	9.6452
	12	Returns-Winner's Stock	-0.0149	-0.0065	-0.0079
		Returns-Loser's Stock	-4.6374	*-1.4275	-7.0539
		Returns-Momentum Portfolio	0.0054	0.0082	0.0112
		Returns-Momentum Portfolio	2.0605	3.8387	9.5768
		Returns-Winner's Stock	0.0178	0.0213	0.0258
		Returns-Loser's Stock	4.0147	5.3252	11.2489
		Returns-Momentum Portfolio	-0.0124	-0.0131	-0.0146
		Returns-Momentum Portfolio	-3.4328	-4.6501	-6.8034

Again all of the zero-cost momentum portfolio returns were negative and statistically insignificant (except one where negative returns were statistically significant in formation period of 6 months with holding period of 36 months). By increasing holding period there is decreasing trend in losses observed in zero-cost momentum portfolios, so it is serviceable to compare the returns in short term and long term holding periods.

## 4.2. Short term vs Long term Holding Period Analysis:

I analyzed zero-cost portfolio return differences between short term and long term horizon among the following strategies;

1. 6/24 vs 6/3,
2. 6/36 vs 6/6,
3. 6/48 vs 6/9,
4. 12/24 vs 12/3,
5. 12/36 vs 12/6,
6. 12/48 vs 12/9,

Table # 3:

Short term vs Long term Holding Period Analysis					
		Holding Period			
		J/K	24-3	36-6	48-9
Formation Period	6	Returns-Momentum Portfolio	0.0488	0.0331	0.0117
	12	Returns-Momentum Portfolio	0.0598	0.0010	-0.0271

Table # 3 shows the positive differences in all of the 6 selected strategies, which shows decreasing trends in losses as I increased the holding period but yet no evidence of momentum effect has been reported from Karachi Stock Exchange.

## 4.3. Sub Sample Period Analysis:

During our analysis of stock prices of 300 companies listed on Karachi Stock Exchange, I have yet analyzed momentum effect in only 1 out of 16 strategies. This may be due to long sample period and literature suggests to sub divide the sample period in such a scenario to properly evaluate the momentum effect. So, I sub divided the sample period into two groups based on the time horizon. I analyzed the data from Jan 1999 to June 2003 in the 1st sub sample period and then from July 2003 to Dec 2007 in 2nd sub sample period as follows;

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Table # 4:

		Momentum Strategies (Sub Period Analysis, 1999-2003)				
		Holding Period				
		J/K	3	6	9	12
Formation Period	3	Returns-Winner's Stock	-0.1267	-0.0019	-0.0024	-0.0001
			*-0.6963	*-0.1822	*-0.2879	*-0.0097
		Returns-Loser's Stock	0.9108	0.0606	0.0439	0.0376
			4.0703	4.4581	5.2492	6.6525
	9	Returns-Momentum Portfolio	-1.0376	-0.0624	-0.0462	-0.0376
			-4.3984	-4.6230	-4.2629	-4.1535
		Returns-Winner's Stock	-0.0053	-0.0018	0.0021	0.0006
			*-0.4069	*-0.2216	*0.2644	*0.0920
9	Returns-Loser's Stock	0.0810	0.0543	0.0331	0.0398	
		3.3449	4.4518	5.9182	7.1006	
	Returns-Momentum Portfolio	-0.0863	-0.0561	-0.0316	-0.0392	
		-3.3057	-4.6817	-4.0579	-4.9265	

Returns of zero-cost portfolios are negative in all of 8 constructed strategies from -0.03159 to -1.03755 (Table # 4). So, there is no evidence of momentum from the period of 1999 to 2003 in Karachi Stock Exchange.

Table # 5:

		Momentum Strategies (Sub Period Analysis, 2003-2007)				
		Holding Period				
		J/K	3	6	9	12
Formation Period	3	Returns-Winner's Stock	-0.1010	-0.0027	-0.0005	0.0012
			*-0.6295	*-0.2720	*-0.0740	*0.1901
		Returns-Loser's Stock	0.2143	0.0204	0.0122	0.0087
			*1.1670	*1.7936	*1.6034	*1.4912
	9	Returns-Momentum Portfolio	-0.3153	-0.0230	-0.0127	-0.0075
			-2.6440	-2.9796	-2.0326	-1.4697
		Returns-Winner's Stock	-0.0074	-0.0046	-0.0018	-0.0062
			*-0.5246	*-0.4635	*-0.2517	*-0.9747
9	Returns-Loser's Stock	0.0283	0.0122	0.0051	0.0061	
		1.3612	*0.8737	*0.6650	*1.005	
	Returns-Momentum Portfolio	-0.0357	-0.0168	-0.0065	-0.0123	
		-2.4019	*-1.4779	*-1.04156	-2.3854	

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Table # 5 also shows the negative returns of zero-cost portfolios in all of the 8 constructed strategies ranging from -0.00646 to -0.31532. Consistency in decreasing trend is obvious from both sub sample periods (Table # 4 & 5).

Then I changed the sample and selected another 50 companies listed on the Karachi Stock Exchange. Here, I limited our analysis by taking eight most representative strategies, i.e. 6/3, 6/6, 6/9, 6/12 and 12/3, 12/6, 12/9, and 12/12.

Table # 6 presents that monthly average return of zero-cost momentum portfolios are (0.0523, -0.0085, 0.0064, 0.0059, 0.0289, 0.0200, 0.0102, and 0.0012). These returns are positive in 7 out of 8 strategies. To find out the average momentum effect value in Karachi Stock Exchange on the basis of these 8 constructed strategies, 3/3 should not be included in average value with reference to the discussion on the contradiction between practitioners and the proponents of contrarian strategy by Jegadeesh and Titman (1993) and 6/6 should also be excluded due to Jan effect. So, I calculated the average monthly return from 6 out of 8 strategies as 0.012 and significant only in 12/3, 12/6 and 12/9 strategy. I conclude our analysis as there is very low momentum effect in Karachi Stock Exchange and these results are aligned with Griffin, Ji, and Martin (2003), Chui, Titman, and Wei (2000) and Rouwenhorst (1999).

Table # 6

		Momentum Strategies				
		Holding Period				
		J/K	3	6	9	12
Formation Period	9	Returns-Winner's Stock	0.0445	0.0063	0.0157	0.0198
		Returns-Loser's Stock	-0.0133	0.0148	0.0086	0.0129
		Returns-Momentum Portfolio	* <i>-1.6769</i>	* <i>1.4598</i>	* <i>1.0179</i>	* <i>0.9876</i>
	12	Returns-Winner's Stock	<i>0.0523</i>	-0.0085	<i>0.0064</i>	<i>0.0059</i>
		Returns-Loser's Stock	6.4559	* <i>-1.1432</i>	* <i>0.6006</i>	* <i>0.5231</i>
		Returns-Momentum Portfolio	0.0489	0.0463	0.0296	0.0162
		6.4381	4.4918	2.5752	* <i>1.6090</i>	
		-0.0185	-0.0003	0.0059	0.0142	
		-3.8817	* <i>-0.0348</i>	* <i>0.6220</i>	* <i>1.0993</i>	
		<i>0.0289</i>	<i>0.0200</i>	<i>0.0102</i>	<i>0.0012</i>	
		3.6678	3.3368	2.5315	* <i>0.3218</i>	

Italic Values indicates the momentum effect

### 5. Conclusion:

The Objective of this paper is to analyze the momentum effect in Karachi Stock Exchange. The study constructed 16 momentum strategies (3-3, 3-6, 3-9, 3-12; 6-3, 6-6, 6-9, 6-12; 9-3, 9-6, 9-9, 9-12; 12-3, 12-6, 12-9, and 12-12) by following equal weighted, full rebalancing and Decile techniques. The data of 300 companies listed on Karachi Stock Exchange from 1999 to 2007 has been used for analysis. The Stocks were ranked on the basis of average monthly stock returns and top ten stocks were selected as winner's stock and bottom ten were selected as loser's stock. Zero-cost momentum portfolio was constructed as long position in winner's stock portfolio and short position in loser's stock portfolio. The Returns of zero-cost momentum portfolio were positive only in 1 out of 16 strategies. Furthermore, a decreasing trend in losses reported in 15 strategies was observed. The analysis was extended to Long Period Analysis", "Short term and Long term Holding Period Analysis" and at the end I sub divide the sample in two groups and check the momentum effect. Here we find some evidence of momentum which remained significant even after changing the sample. We took another sample of monthly stock prices of 50 companies listed on Karachi Stock Exchange and analyzed the effect by taking eight most representative strategies, i.e. 6/3, 6/6, 6/9, 6/12 and 12/3, 12/6, 12/9, and 12/12. These strategies were also constructed on the basis of equal weighted, full rebalancing and Decile techniques. I calculated the average monthly return from 6 out of 8 strategies as 0.012 and significant only in 12/3, 12/6 and 12/9 strategy. The study concludes that we found low but significant momentum effect in Karachi Stock Exchange and these results are aligned with Griffin, Ji, and Martin (2003), Chui, Titman, and Wei (2000) and Rouwenhorst (1999).

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