Return Anomalies: Does Disposition Drive Momentum in Pakistan Stock Market?

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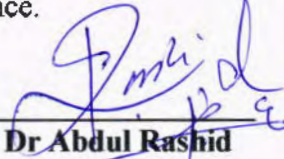International Islamic University (IIUI), Islamabad, Pakistan

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Accepted by the International Institute of Islamic Economics, International Islamic University, Islamabad, as partial fulfillment of the requirements for the award of degree of MS in Economics and Finance.
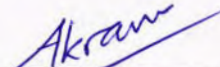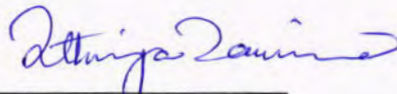
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Dedication

To My Parents, Teachers

& Family

Declaration

I hereby declare that the work presented in the following thesis is my own effort, except where otherwise acknowledged and that the thesis is my own composition. This publication is pioneer in its context and has neither similarity to any previously submitted thesis nor any copied material in its contents from any source except where due reference is clearly mentioned. All of the published data is result of my own efforts, research and analysis with support of those mentioned in acknowledgement, in specific my supervisor.

Salka Rana

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Abstract

The term anomaly refer to the condition in which financial markets exhibits unusual performance from natural condition to shocking condition. According to conventional finance markets are efficient if investors take financial decisions rationally. On the other hand, behavioral finance argue that markets participants do not take rational decision rather, they incorporate their psychological, social and behavioral tendencies while taking any financial decision. The rich information about anomalies allow investors to better understand financial market behavior. Therefore, the study main aim is to find the relationship between disposition effect and momentum in PSE as well as in bulls and bears market. Moreover, to find whether the disposition effect have an adequate amount of supremacy to drive momentum in PSE.

The study sample data consists of unbalance panel weekly data set of all the firms listed in PSE over a period of January 2000 to December 2016. In order to estimate our results we use Fama-Macbeth (1973) regression analysis. The study major findings can be summarized as follow. First, we find that there is persistence of momentum effect in PSE over the sample period. Second, there is no evidence for the presence of momentum reversal. Third, we also find the existence of volume, seasonality as well as size effect in PSE. Fourth, the disposition effect do not have supremacy to drive momentum effect in PSE as well as persistence of momentum in PSE is not successfully explained by disposition effect.

From the policy implication point of view there must be mechanism develop by regulatory authorities that provide balance information to investors through financial knowledge and accounting information, create liquidity in stock market, small firms protection policies must develop so that they grow more in long term, develop stable mechanism through which asset mispricing get corrected instantly. Further, this study provide strategic gateway to future researchers to explore significant determinant other than disposition effect that are responsible to drive momentum in PSE.

Key words: Efficient Market Hypothesis, Behavioral Finance, Disposition effect, Momentum effect, Bulls Market, Bears Market.

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Contents

List of Tables

List of Figure

Chapter 1

Introduction

1.1 Background

Trim your losers, and ride your winners! That is the best regular recommendation provided in the trading rules of stock market. However, investors feel complexity while practicing this suggestion. Instead, they tend to feel eager to sell winners stocks since buy and hold losers stocks. Financial economists label this tendency as disposition effect (Ashraf *et al.* 2014). Disposition effect is the most attractive and well defined behavior bias among individual investors, it is first discovered by Shefrin and Statmen (1985).

Conventional finance theory believe in a concept of market efficiency which undertakes that market participants behave in a rational manner as well as they take coherent optimal investment decisions that provide them higher expected possible outcome. Moreover, stock prices consider to be superior indicator in efficient markets which infers all the relevant available information instantly. In addition, stock prices in efficient market change in unpredictable manner as well as usually follow a random walk that restrain any investor to beat the market by predicting past market trends (Hmida, 2017).

On the other hand, behavior finance argues that it is not necessary that investors indicate rational behavior while taking financial decision. Relatively, investors over or underreact to new available information and tries to forecast market trends. As well as, markets participants do not always take rational decision instead they incorporate their

behavioral tendencies, attitude, social aspects, cognitive aspect and psychological aspects while taking any financial decisions. Therefore, the presence of these physiological as well as emotional biases and regularities in stock prices enables investors to outperform the market. Consequently, the persistence of earning abnormal return opportunity causes anomalies in financial market. Therefore, the different empirical studies after the 1980s argue that investors have different personnel tendencies and attitudes due to which they do not constantly take rational decisions and able to predict stock market trend. However, stock prices do not always follow a path of random walk instead sometime they change in constant manner. These studies denied the presence of efficient market hypothesis as well as provides evidence for persistence of market anomalies and behavioral biases which enable investors to take irrational financial decisions (Shiller, 1984; Thaler, 1985; Barberis *et al.*, 1998; Daniel *et al.*, 1998; and Shiller, 2000).

The disposition effect is well documented as well as one of the financial irregularity acknowledged in empirical literature. This behavior biases refers to the investor's tendency in which they feel eager to sell winners stocks too early and reluctant to sell losers stocks. This investor behavior evidently showed by both individual and institutional investors in asset markets across the world. It is built on the mixture of prospect theory proposed by Kahneman and Taversky (1979) and mental accounting proposed by Thaler (1985). The prospect theory combine with mental accounting considered to provide leading explanation for disposition effect (Grinblatt and Han, 2005).

The key element of prospect theory is an S-shaped value function. In S-shaped value function concave portion shows risk aversion in domain of gains and convex portion shows risk seeker in domain of losses, both gain and loss measured with reference point. However, disposition effect occurs because investors use purchasing price as reference price and feel eager to realize capital gain and reluctant to realize capital losses. Mental accounting offers underpinning guidance through which investors established reference point for gain and loss accounts. However, investors when plan trade activities open mental account in their mind and assign weight to different assets and stocks position. Then, by apply prospect theory investors set reference price and follow the track of gain and loss in their mind (Grinblatt and Han, 2005).

Several studies shows that prospect theory combine with mental accounting offers a finest description for cross sectional stock returns pattern, disposition effect and its relation to momentum. It is concluded that prospect theory and mental accounting are considered to be best in explaining cross-sectional expected returns (Barberis and Huang, 2001; Frazzini, 2006). Grinblatt and Han (2005) motivated with the prospect theory/mental accounting established a theoretical model of equilibrium prices and find the presence of momentum over three and one year time period. Moreover, the results of the previous studies suggest the positive relation between expected return and capital gain and conclude that in the USA, disposition effect has the stronger power to derive momentum effect.

As in Grinblatt and Han (2005) theoretical model of equilibrium prices, there exist both rational investors who take rational decisions and disposition inspired

3

investors who trade winners too earlier and feel reluctance to trade losers and prefer to hold losers over a longer period of time. For the stocks held by disposition investors, cause the excessive trading of winners with the revelation of good news and holding losers with the revelation of bad news. Thus, it enforces stock prices to over and under-react to news, in a result investors have collected realized capital gains and unrealized capital losses. According to Kong *et al.* (2015), when the behavior of a disposition investor is incorporated with the perfectly elastic stocks demand by rationale investors, creates return predictability. Therefore, it results in an under reaction to news as well as create return based momentum as predicted by (Jegadeesh and Titman, 1993). However, it generates gap between stocks market value and fundamental value. As, this mispricing is corrected, the return predictability arises and investors make profit from momentum strategies.

Figure 1: V-Shaped Curve
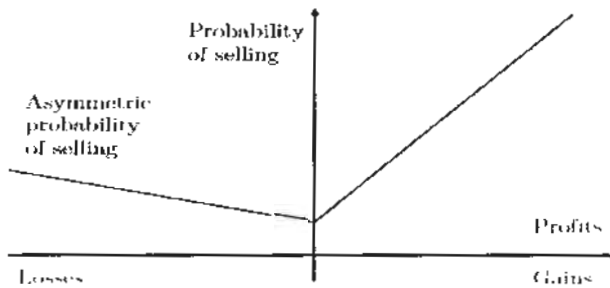
Note: The figure shows V-shaped selling propensity relative to profit. The v-shaped curve represents higher selling tendency for gain compared to loss that the side of gain is steeper than side of loss. Hence, investor selling tendency expand with the increase in the size of profit and loss. This creates excess selling pressure that causes temporarily fall in price and increase in future return as the price goes back to their fundamental value (Ben-David and Hirshleifer, 2012).

Ben-David and Hirshleifer (2012) use individual trading data and find that individual selling propensity is a function of profit, which is V-shaped. In which selling propensity increases with the increase in magnitude of profit and loss. Figure 1

represents Ben-David and Hirshleifer (2012) V-shaped curve. The V-shaped curve represents that investors' show higher selling propensity in case of gain as compared to loss such that gain portion is steeper than loss portion. Therefore, the investors selling propensity rises with the increase in the magnitude of profit and loss. This creates excess selling pressure that causes temporarily fall in price and increase in future return until the prices revert back to their fundamental value.

Dupernex (2007) provides arguments in contradiction of random walk hypothesis. Moreover, he explains that with the existence of short term and long term serial correlation, stock prices usually indicate trends rather than follow random pattern. As well as there is presence of momentum trend in stock price that would be reversed in long term. For instance, Fama (1998) explains that due to over and under reaction behavior demonstrated by financial investors denied the random walk hypothesis of stock prices. The serial correlations in stock returns imply that stock having positive returns in past also have positive returns in future. This increasing trend in stock return named as momentum effect and under-reaction effect in literature (Jegadeesh and Titman, 1993). However, if the stock returns manifest negative serial correlation then it implies that stocks having positive returns in past may likely to have negative returns in future. This reverse in return pattern named as momentum reversal effect or overreaction effect (Bondt and Thaler, 1985).

It is not offensive to say that, till the emergence of the efficient market hypothesis (EMH), there is extensive debate over a years that whether stock markets are efficient or not. This is because, there are large number of investors in stock market that have diverse behavior, trading attitude, tendencies and values with each other's.

5

This diversity in the behavior of investors allows them to take financial decision differently and sometime irrationally. This perception causes investor biases, prejudice and anomalies to survive in the financial markets besides, it promote markets to deviate from efficiency point. The persistence of financial market anomalies challenges the validity of CAPM and market efficiency. Moreover, there is extensive work in the literature that tries to explore the relationship among disposition and momentum effect in develop countries. However, there is still need to collect more empirical literature from emerging as well as developing economies to provides substantial evidence that anomalies persist and its persistence affect financial markets differently in develop as well as in developing stock markets. The study main aim is to find the association among disposition and momentum effect in PSE. Further, it investigates whether the disposition effect actually drives the momentum effect in PSE.

1.2 Problem Statement

According to Fama's (1970) EMH, the financial markets are informational efficient if the stock prices instantaneously reflect all the available market information. Furthermore, in efficient markets the underlying asset represents their correct market value. However, behavioral finance argues that capital markets in developing countries undergo from information asymmetry. Therefore, the difference between availability and understanding to new information leads toward disposition effect. The disposition effect and momentum are the financial market return anomalies. Anomaly refers to the condition which is deviation from standard, usual or expected situation. As well as, behavioral finance refer the term anomalies as the behavioral biases which cannot validate by CAPM. The existence of anomalies leads toward market inefficiency and

causing mispricing in financial market assets. The behavior of financial markets anomalies are unpredictable they seem to disappear, reverse and diminish over a period of time.

Market participants take a part in any trading activity in order to get higher optimal benefit from it. Therefore, they attract towards abnormal returns and always attempts to find different strategies that give them an excess return on their investments. In addition, financial market investors always tries to predict price pattern, variation and insider information in order to successfully pursue their proficient trading strategies. However, in the empirical literature the existence of financial market anomalies is acknowledged. Moreover, several researchers have tried to explore that whether distractions caused by anomalies in financial market are valuable or not. If the investor successfully forecast the price pattern prevailing in stock market then they can easily outperform the market by transform trading activities according to predicted price movement. Moreover, this predicted price pattern became the core reason for financial market anomalies. Therefore, after examine the importance of predicted price trend, establish a study to understand financial market anomalies is worthwhile. Further, understanding with financial market anomalies not only important to learn market behavior but to understand abnormal returns generation opportunities in financial market.

1.3 Objectives

The study key objective is to analyze the relationship among disposition and momentum effect in a framework of prospect theory/mental accounting in PSE. Furthermore, study aims to analyze whether there is presence of momentum strategies

in PSE that enables investors to earn excess returns. Moreover, for comprehensive explanation the study also focuses on whether the impact of disposition effect is significant to leads momentum in bull and bear market trends. For instance, increasing and decreasing markets have the prospective to effect magnitude of investor's financial choices as well as trading behavior tendencies.

1.4 Research Questions

The PSE is the emerging economy facing certain economic and political challenges with the substantial impediment of growth. The study main focus is to explore that whether disposition effect have significant impact to derive momentum in PSE. We study this relationship in bulls and bear markets as well because we assume that upward and downward market trends have the potential to transform investors' behavior and decision power tendencies. The study main research question can be further break down in to the following questions:

1. Is there a presence of stock return momentum in Pakistan Stock Exchange?
2. Does the disposition effect have adequate power to drive momentum in Pakistan Stock Exchange?
3. Does the relationship among disposition and momentum effect differ in bulls and bears market?

1.5 Significance of the Study

The radical change in the behavior of investors due to manifestation of behavioral biases and market anomalies causes progressively changes in the investment arrangement and expectations of market participants. The appetite of investors to earn more and more future returns enable them to incorporate their emotional, psychological

as well as cognitive tendencies in decision making. Therefore, these potential tendencies allow investors to outperform the market however, rejected the condition for market efficiency. As well as, the assets fundamental value overreact or underreact compare to its market value and it can be said that assets are mispriced.

From the substantial empirical literature we come to know that stock price are greatly influenced by market anomalies. Therefore, the presence of these anomalies are evident from literature shows that stock markets follow trends. Besides, correctly judgment about prevailing trend allow investors to generate abnormal returns by incorporating cognitive behavior in decision making. Furthermore, investors are able to transform their investment strategies according to dominant market movements. The study tries to provide comprehensive explanation for the persistence of momentum profit in response with disposition effect which helps market participants to modify their investment schedule in order to evade particular level of future losses. On the other side, the results of this study benefits government and regulatory institution for the enactment of polices as well as modification of their current policies to discontinue the persistence of theses anomalies. Furthermore, they take steps to achieve market efficiency that is a vision for any country to attain on long term basis in which all the relevant available information reflect in stock prices. Therefore, presence of informational efficiency in financial market allow assets to correctly priced and depict their accurate market value.

In addition, the study significance can be enlightened in the following aspects. First, it investigates the relationship between disposition and momentum in bulls and bears market. Therefore, the findings of the study give benefit to both individuals as well as

institutional investors in setting their investment strategies and adjustment of their investment pattern according to bull and bear market trends. Second, understanding the disposition effect enables market participants to understand market behavior. Moreover, it provides useful information for financial advisors to educate clients and for asset managers to accomplish trading activities. Proof for the presence of market anomalies enables government and regulatory authorities to take substantial steps for the policy implementation and amendments in existing policies. They develop significant policies and mechanism through which investors cannot able to earn abnormal profit by predicting past pattern of prices, publically available information and insider information. In short, no investor have access to acquire private information. Furthermore, understanding with the market anomalies is essential for the market participants in order to maximize their future returns and to hedge portfolio against future uncertainties.

1.6. Thesis Outline

This chapter objective is to acquaint the thesis theme in the introduction section that provide the foundation for this study. Moreover, in this chapter we discuss problem statement, objective of the study, research questions as well as significance of the study that provide rationalization in the favor of our study prominence. However, the remaining thesis is organized as follow. In Chapter 2, we provide theoretical frame work of the study that highlights the difference between traditional finance and behavioral finance. Precisely, this chapter is divided into four subsections. Section 2.1 discusses efficient market hypothesis and its rationale. Section 2.2 discusses financial market anomalies that are conceptually divided in to three parts that include technical anomalies, fundamental anomalies and calendar anomalies. Section 2.3 deliberates major financial market

10

anomalies. Section 2.4 discusses transmission mechanism through which disposition effect drive momentum in PSE.

The chapter 3 presents literature review it is divided into five subsections. Section 3.1 discusses leading concepts for disposition effect. Section 3.2 discusses importance of prospect theory and mental accounting framework. Section 3.3 discusses empirical evidence related to disposition and momentum effect and combine for disposition effect and momentum. Section 3.4 discuss concluding remarks of literature review. Section 3.5 discusses study gap in literature. The chapter 4 presents hypotheses of the study, methodology and sample data. This chapter is divided into three subsections. First section discusses study four hypothesis second section discusses theoretical framework, methodology, study empirical model and description for variables. Third section discusses sample data and its source.

The chapter 5 presents study empirical results. It divided in to four subsection. Section 5.1 discusses summary statistics of study variables. Section 5.2 discusses Fama and Macbeth (1973) regression analysis based results in which market specified anomalies are tested. Section 5.3 discusses estimated results in bull and bear market trends. Section 5.4 discusses results robustness. The chapter 6 presents conclusion of the study and it divided in to four subsections. First section discusses background second section discusses key findings of study. Section three discusses implication of the study. Section four discusses study limitations.

Chapter 2

Theoretical Framework

An essential as well as most debated subfield of finance is called behavioral finance. Behavioral finance deals with the behavior of individuals that why investors take irrational financial decisions rather than rational decisions in trading and other financial activities by incorporating the diverse aspects from behavioral as well as psychological theory. Behavioral finance tries to capture all the features of investors' biases, irrational behavior of financial investors and investors' psychological and emotional factors that have potential to put effect on economic and financial decisions. Moreover, the irrational behavior of investors leads towards the rejection of efficient market hypothesis (Sewell, 2007).

In behavioral finance, the physiological factors includes overconfidence, biases, social influence, and emotional factors. These factors emphasis on the investors to satisfied and peruse their irrational preferences in efficient markets (Birau, 2012). Furthermore, behavioral finance argue that individual economic as well financial decisions effected with the magnitude of emotional factors like greed, distress, anxiety, agitation, satisfaction, desire, determination and elation (Birau, 2011). The both psychological as well as emotion factors of investors considered to be responsible for creating inefficiency in financial markets. The essence of EMH is that there is free availability of information to all market participant and prices reflect all the available information instantaneously. Therefore, investors do not have power to beat the market by predicting any past trend in market. In addition, efficient markets allow investors to estimate stock fundamental value through its

actual value however, the stocks actual prices considered to be the best estimator in order to calculate stock fundamental value (Fama, 1965; Fama, 1970).

Traditional finance asserts that in efficient market investors are rational and take rational decisions by picking optimal portfolios which give them a higher potential returns in long term with acceptable risk factor. Specifically, there is no investment approach which have ability to provide risk-adjusted surplus return on average in the presence of efficient market (Barberis and Thaler, 2003). The theory of market efficiency comprises three types of efficiencies that are allocation efficiency[1], operational efficiency[2] and informational efficiency[3]. Moreover, it can be said that markets that have higher level of informational efficiency have ability to achieve allocation as well as operational efficiency (Muslumov *et al.*, 2004). Thus, EMH not promise with market participants to beat as well as out-perform the market over longer period of time because prices reflect all the available information instantaneously. Therefore, if the investors have any new information about market trend it already adjusted in stock prices before the investors show reaction over it (Birau, 2004).

There are four elementary units for behavior finance that are proposed by Statman (2010). He claims that investors do not show rational behavior, there are inefficiency in markets, mental accounting is the driving force when individuals make financial decisions and market capitalization consider to be key aspect which define stock returns. Every

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[1] Allocation efficiency means to allocate asset efficiently which are Pareto optimal in nature. In addition, it implies that the allocation of financial as well as economic resources in such a way that provide benefit to all market participants.

[2] Operational efficiency implies condition in which transfer of funds must be rational. In operational efficiency the price of individual's transactions is nearly equal to the cost which is required to deliver them.

[3] Informational efficiency implies that on average market shows all the available information instantaneously in stock prices.

investor has different characteristics as compared to other investors. Indeed, investors have difference in their culture, behavior, religion, education, experience, financial stability, socio-economic condition, marital status, beliefs and traditions. However, it is not possible to separate the expectations as well as personality of investor from his financial decisions which allow investor to take irrational decisions. Flawless replacement to classical finance do not provide by behavioral finance. On the other side, behavioral finance tries to furnish justifications for the problems encounter by traditional theories in describing definite financial facts. Behavioral finance provides a field which combine both investors influencing principles and social phycology with traditional financial principles in order to describe how the reasoning and intellectual error effect investors decision power, stock prices and performance of financial markets. As well as, behavioral finance also provides justification for financial anomalies with the help of behavior and decision building procedure of investors (Birau, 2004).

2.1. Efficient Market Hypothesis (EMH)

Efficient market is the market where stock prices incorporate all the relevant information instantaneously and investors are not able to beat the market as well as outperform the market. Therefore, efficient markets allow stock prices to adjust according to the newly available information immediately before the investors express reaction over it. There are three major arguments on which EMH is based. First, market participants (investors) consider to be rational and they take rationally optimal decisions that give them the best higher returns in long run. In addition, investors choose securities with the higher rate of expected utility. Second, in case if the investors do not show rational behavior then their trading decisions must follow random pattern which balance any impact on stock

14

prices. Third, the investors' irrational behavior impact on stock market eradicated with the help of rational arbitragers.

The EMH categorized market efficiency in three forms that is weak form, semi strong form, and strong form. A weak form of market efficiency implies that market participant are not able to earn excess return in financial market by incorporating the past pattern of prices. Therefore, there is no relationship between past trend of prices and future returns as well as investors cannot earn abnormal return with technical analysis. Semi strong form implies that investors do not have potential to outperform the market by incorporating publically available information. Because publically available information already incorporate in stock prices before the investor take any potential decision over available information. Therefore, investors cannot able to earn abnormal return through fundamental analysis. Strong form of efficiency implies that investors are not capable to beat the market by incorporating insider information. Further, this condition, represents that stock prices instantly incorporate all past, public as well as insider information and there is no availability of excess returns over a long term (Fama, 1970).

The efficient market hypothesis follows a three crucial theories included fair game model, sub-martingale, and random walk. Fair game model infers that on average actual return on a security are equal to its expected returns. Additionally, in fair game model, prices are adjusted to new information and if the investors perceive past price pattern in trading activities receives return which is equal with the risk factor. The rivalry among large firms, price responsiveness investors and frequent transactions by large amount of traders allow prices to modify with the new information more instantly and investors are not able to perceive past price pattern to outperform the market. Sub-martingale indicates

15

that tomorrow price of a security is greater than the today prices. In addition, sub-martingale is also a fair game and represents that investors do not outperform the market in order to earn abnormal return (that are adjusted with the risk) by incorporation the past knowledge. The random walk model indicates that price usually follows random walk which cannot be predicted and prices depicts today information not yesterday pattern. Moreover, the past pattern of prices do not have any correlation with future pattern of prices. Therefore, no investor can beat the market by incorporating the past trends.

2.2 Market Anomalies

The term anomaly refers to the condition in which financial markets display unusual performance or deviation from natural condition to astonishing condition (Frankfurter and Mcgoun, 2001). Moreover, market anomalies mention a situation in which investors take investment decisions apart from the concept of rationality as well as efficient market hypothesis (Silver, 2011). In addition, existence of financial market anomalies reject the conditions that are necessary for the survival of efficient markets. Sometime, it is difficult to accomplish efficient markets and more challenging to sustain them over a longer period of time. Market anomalies are of different types. Some anomalies are appear and vanish in long term while other appear, persist and observable over a time (Tversky and Kahneman, 1986). According to the study of Latif *et al.* (2011) market anomalies can be divided in three main categories. These anomalies includes technical, fundamental and calendar (seasonal) anomalies.

2.2.1 Technical Anomaly

Technical anomaly refers to the condition in which investors have the power to forecast expected return by perceive past price pattern and past event information with the

help of technical analysis of prices. Technical analysis includes moving averages and trading range break. Moving average is the most imperative method in which indication for buying and selling stock depends on short and long period average. Investor take benefit from this strategy by involve in buying activity when average of short period increases compared to long period average. On the other hand, investors' pursue selling activity of stocks when average of long term increases as compare to short period average.

The other technical analysis part is trading range break which works under the supportive[4] and resistance[5] level. As, the prices are reached at resistance point that is highest level then investors want to sell stocks more and more at this peak position. Therefore, because of high selling pressure resistance level fall more than the previous level. This breakout in resistance level allow investors to shape their buying strategies. On the other hand, when the prices achieve supportive level that is minimum level. Investors want to buy more and more at this down position due to buying pressure resistance level high more than the previous level. This increase in supportive level allow investor to speed up their selling strategies (Brock *et al.*, 1992).

2.2.2. Calendar (seasonal) Anomaly

Calendar anomaly refers to the time based anomaly. It represents diverse behavior of stock market over different time in week, month and year. The existence of calendar anomaly rejects weak form of market efficiency implies that no market participants earns abnormal returns by establishing trading rules that are based on past price trend. Calendar

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[4] Support level refer as the minimum price level act as a floor and preventing stock prices to being fall more. At this level investors know the stable value of asset and encourage price to again push in upward direction.

[5] Resistance level refer as the stock price level which remain constant at certain price and fail to get above from it over a several period of time.

anomaly categories as the January effect, the December effect, the weekend effect, the month effect and the year effect.

The January effect refers to an increase in stock prices during January as compared to other months of the year. Moreover, it represents the increased value of small firm stocks than other firms especially in the first two three week of the month (Keims, 1983; Chatterjee and Manaiam, 1997). The weekend effect refers as the increase in stock prices on Friday and decrease in stock prices on Monday. However, investors feel lazy on Monday rather feel more energetic and financial active on Friday (Smirlock & Starks, 1986). The year effect refers as the increase in stock prices and volume at the last week of year end month December and this effect remain significant till two or three week of January (Agrawal & Tandon, 1994).

2.2.3. Fundamental Anomaly

Fundamental anomaly refers to the anomalies that are persist in trading of financial securities. Fundamental anomaly describes the fact that prices of any financial asset is subjected to demand and supply mechanism. With the help of fundamental analysis investor predicted the prices of stock by examining political, social and economic factors that are likely to affect stock prices (Dana and Cristina, 2013). Fundamental anomaly categories as low price to book (P/B) ratio, low price to earnings (P/E) ratio, high dividend yield, value anomaly, and neglected stocks.

Low (P/B) ratio implies that the firms with low (P/B) ratio have greater potential to generate more returns compared to firms with high (P/B) ratio (Fama, 1991). Low (P/E) ratio refers as the stocks with low (P/E) ratio have the ability to outperform market by providing abnormal returns. However, stocks that have high (P/E) ratio show unsatisfactory

market performance (Goodman & Peavy, 1983). High dividend yield refers to the stocks that enjoy higher yield dividend beat the market and provide excess returns as compare to low dividend yield stocks (Fama and French, 1988).

Neglected stocks implies that stocks neglected over a period outperform the market and provide excess return as well as the stocks that are performing good underperform the overall market by providing low returns (Debondt & Thaler, 1985). Value anomaly refers to the incorrect anticipation of investors. They overestimate the expected return and earning firms which show higher growth over a period of time and underestimate the expected returns and earnings of the firms that show value or low growth over a period of time (Graham & Dodd, 1934).

2.3. Major Financial Markets Return Anomalies

The return anomalies refer to the financial market condition in which market participants are able to earn excess return and their behavioral, social as well as psychological tendencies allow them to outperform the market by incorporation past market trends, publically available information and insider perception about market. Presence of return anomalies in any financial institution reject the assumption of efficient markets. The major financial market anomalies are consider to be following:

- Size effect

- Growth effect (value effect)

- Seasonality effect (Calendar effect)

- Momentum effect

- Disposition effect

2.3.1. Size Effect

The size effect also called small cap effect which implies that firms having small market capitalization[6] earns more return as compare to the firms having large market capitalization[7]. The thought of earning higher return by investing in small cap firms was first documented by Banz (1981) in his study by examining the US stock market. The results of study argue that in general the size coefficient has more power to predict future returns as compare to coefficient of CAPM.

There are several studies find the existence of size effect in major securities of diverse markets around the world from its emergence till now (Banz, 1981; Herrera and Lockwood, 1994; Hawawini and Keim, 2000; Hou and Moskowitz, 2005, Sakr *et al.*, 2014 and Schmidt *et al.*, 2017). The reasonable justification to earn higher returns by investing in small cap firm is due to greater potential to grow, unpopularity, involvement of higher risk, higher elasticity to develop over a business cycle especially during upward market trends and substantial inside improvement as well as innovation allow small cap firms to grow more vastly as compare to large cap firms.

2.3.2. Growth Effect (value effect)

Value stocks are the stocks that on average have lower prices compared to current profit, dividend, earning and cash flow. However, values effect refer to the value stocks that have significant tendency to outperform the market for a larger time period. Moreover, the stocks with high book to market (B/M) ratio beat the market to provide excess return

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[6] Generally the firms with market capitalization between $300 million to $200 billion or less than Rs2 cror is called small cap firms.

[7] Generally the firms with market capitalization more than $10 billion or more than Rs 10,000 cror is called large cap firms.

as compare to low (B/M) ratio stocks (Xing, 2008). The book to market effect is one of the oldest effect in finance that relate book worth of a company with its share price. Book to market value not deliberate to be financial market anomaly at the beginning as well as lost its attractiveness after the two major theories of CAPM and market efficiency emerges. However, it gains popularity and fame after different studies approve its rationality and understanding of using it.

2.3.3. Seasonality Effect

The seasonality effect refer to the investors behavior in which they express diverse behavior over different period of time like a specific day, week and month is dominated over others. Seasonality in stock returns may take place due to holidays, weather, liquidity restriction, tax loss selling effect and exceptional event impacts. Many studies tries to explore the seasonal tendency of market participants in diverse market setup across the world. The initial seasonal anomaly exposed was January effect which is proposed by Wachtel (1942), finds the presence of robust tendency in stock prices in US over a period of 1924 to 1939. Moreover, there is presence of January as well as April effect in US stock market (Wang and Hefner, 2014). Furthermore, Lean *et al.* (2007) argue that the January effect is dominated over all months of the year. However, Chu-Ke *et al.* (2014) find signal for the occurrence of February effect in Taiwan Stock Market. There is presence of significantly positive seasonality as well as calendar effect in PSE. However, existence of anomalies in stock market enable the investor to better predict future return pattern as well as it provide opportunity to investors to beat the market (Hashmi, 2014; Zafar *et al.*, 2012; and Haroon and Shah, 2013).

21

2.3.4. Momentum Effect

The momentum effect is considered to be primary challenge to efficient market hypothesis. It is first proposed by Jegadeesh and Titman (1993). They state that the past pattern of prices have positive relationship with future returns. Moreover, the stocks that achieve higher value in past tend to be outperform the stocks that losses value over an intermediate period of time. Therefore, the market participants buy stocks that yield statistically remarkable higher returns at current time period and sell stocks that yield low returns at present time period. The momentum effect implies a positive correlation in stock returns which indicates that the stocks have positive returns in past provide positive returns in future it is also called under-reaction effect. On the other hand, the stock returns that show negative serial correlation infers that the stocks having positive return in past may likely to have negative returns in future. This reverse in return pattern known as momentum reversal effect or over-reaction effect (Bondt and Thaler, 1985). The fundamental motivation for momentum persistence is investment tactics, herding behavior, investors sentiments, contrarian approaches and under and over reaction to event information.

2.3.5. Disposition Effect

The disposition effect is a financial market abnormality that exhibit investors' propensity to trade winner stocks too early and reluctant to trade losers stocks. The underling investor behavioral tendency first proposed by Shefrin and Statman (1985). The disposition inspired investor feel eager to trade stocks that gain in value to extract benefit from it in current time period. Because, the future is uncertain and it is possible that the stocks provide capital gain today may provide capital loss in future time period so investors want to realize capital gain as early as possible. On the other side, investor feel reluctant to

22

sell loser stocks because there is possibility of capital gain over loser stocks in future so investors prefer to wait for reasonable period of time. Presence of disposition inspired investor in any stock market reject the market efficiency condition which assume no investor able to outperform as well as beat the market because of information higher intensity to reflect instantly in stock prices. [8]

3.4. Transmission Mechnisum for Disposition and Momentum Effect

To understand the relationship among disposition effect and momentum the investors must have adequate knowledge about the mechanism through which disposition effect derive momentum in financial markets. However, the necessary information about disposition effect and momentum effect help investors to better understand market behavior. Moreover, it also enable investors to understand that how assets are over and under react to any new market direction with the existence of disposition and momentum effect. Furthermore, sensitizing investor with the mechanism through which assets come back to their equilibrium point to represent their actual market value. Figure 2 represents the graphical mechanism through which disposition effect derive momentum effect in stock market.

[8] Financial markets other anomalies are neglected firms effect, insider information effect, Ramzan effect, Muharram effect, new announcement effect, weather effect, event month effect, data mining effect and survivorship effect.

Figure 2: Transmission mechnisum through which disposition derive momentum in stock market

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                        ┌─────────────────────┐
                        │  Reaction to News   │
                        └─────────────────────┘
              ┌──────────────────┴──────────────────┐
     ┌──────────────────┐                  ┌──────────────────┐
     │    Good News     │                  │     Bad News     │
     └──────────────────┘                  └──────────────────┘
              │                                      │
┌───────────────────────────────┐   ┌───────────────────────────────┐
│ Investor  Willing to Sell      │   │ Investor Reluctant to Sell     │
│ Winners                        │   │ Losers                         │
└───────────────────────────────┘   └───────────────────────────────┘
              │                                      │
     ┌──────────────────┐                  ┌──────────────────┐
     │ High Selling     │                  │ Low Selling      │
     │ Pressure         │                  │ Pressure         │
     └──────────────────┘                  └──────────────────┘
              └──────────────┬───────────────────────┘
                    ┌─────────────────────┐
                    │  Disposition Effect │
                    └─────────────────────┘
              ┌──────────────┴───────────────────────┐
┌───────────────────────────────┐   ┌───────────────────────────────┐
│ Stocks Supply Increase Demand  │   │ Stock Supply Decrease          │
│ Decrease                       │   │ Demand Increase                │
└───────────────────────────────┘   └───────────────────────────────┘
              │                                      │
     ┌──────────────────┐                  ┌──────────────────┐
     │ Stock Price      │                  │ Stock Price      │
     │ Decrease         │                  │ Increase         │
     └──────────────────┘                  └──────────────────┘
              └──────────────┬───────────────────────┘
                    ┌─────────────────────┐
                    │  Asset Mispricing   │
                    └─────────────────────┘
              ┌──────────────┴───────────────────────┐
┌───────────────────────────────┐   ┌───────────────────────────────┐
│ Investor Predict Patteren and  │   │ Investor predict Patteren and  │
│ Sell Losers                    │   │ Buy Winners                    │
└───────────────────────────────┘   └───────────────────────────────┘
              └──────────────┬───────────────────────┘
                    ┌─────────────────────┐
                    │      Momentum       │
                    └─────────────────────┘
              ┌─────────────────────────────────────┐
              │   Asset Mispricing Corrected        │
              └─────────────────────────────────────┘
```
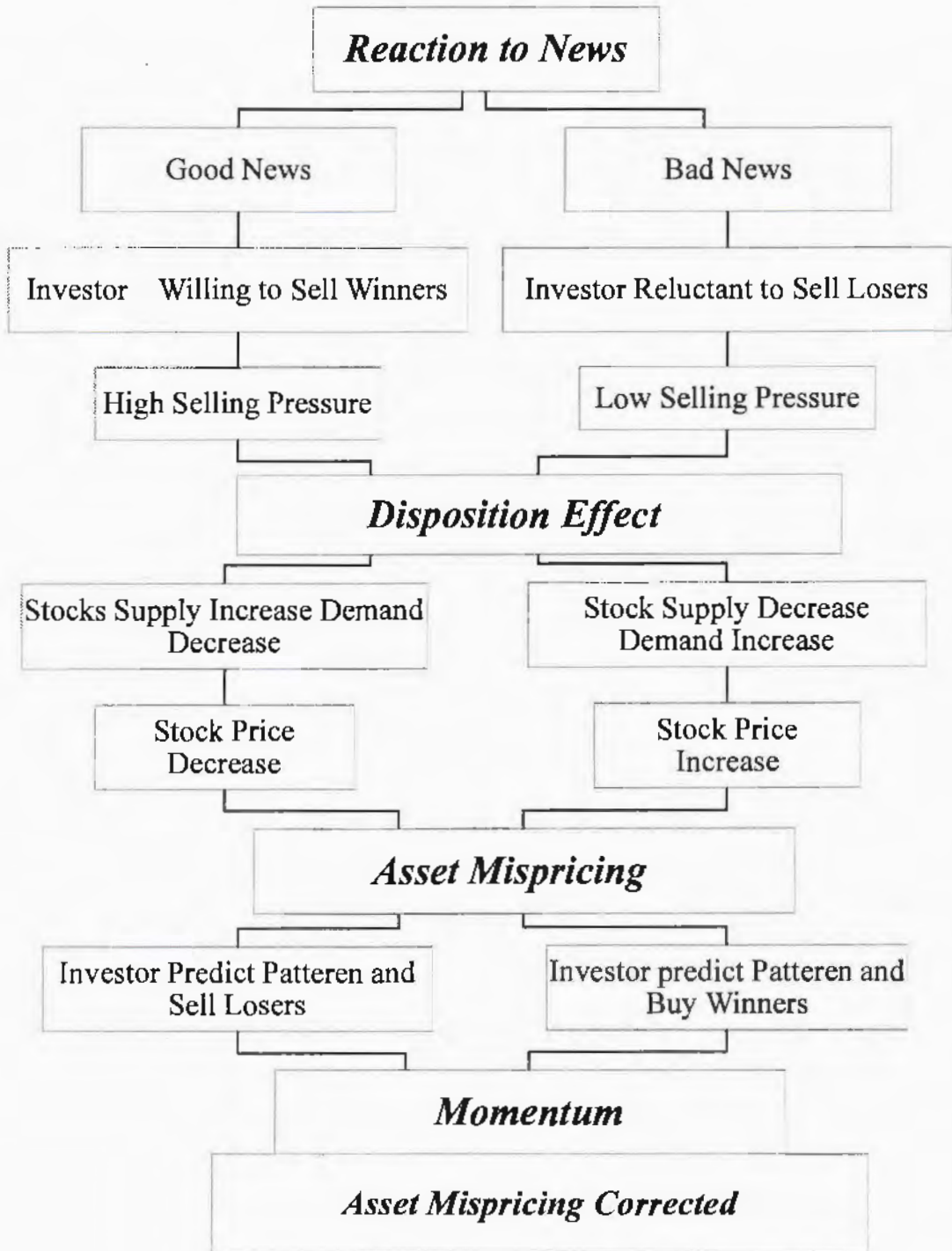
Figure 2 exhibits the transmission mechanism through which disposition derive momentum in stock exchange. The starting point for disposition effect in stock market is reaction to news. News generally are of two types one good news and other is bad news. Therefore with the arrival of good news about stocks investors evaluate news as positive signal to enhance capital gain. Therefore, after revelation of good news investors tries to sell winner stocks because they want to realize capital gain as early as possible. This behavior of investors, increase the selling pressure in the stock market. However, with the arrival of bad news about stocks investors evaluate it as bad signal which reduce capital gain. Hence, investors tries to keep losers stocks because they do not want to realize their capital gain loss and kept losers with them for a hope that may in future these stocks give them return. As a result of this behavior of investors, selling pressure of stocks decrease in stock market. Reaction to news by investors create disposition effect which infers that investors show risk aversion in case of winner stocks and feel eager to sell them. However, investors are risk seeker in case of losers stocks and they feel reluctance to sell them. Therefore, they keep losers with them with a hope to receive capital gain in future (Shefrin and Statmen, 1985).

Disposition effect in case of good news causes the stronger supply and weaker demand for the winners stocks. In a result, prices of winner stocks decrease immediately. However, disposition effect in bad news causes weaker supply and stronger demand for losers stocks. In a result, prices of loser stocks increase instantly. This demand and supply mechanism creates under-reaction and over-reaction to news. Therefore, the assets are overstated and understated from their actual value and do not truly represents their market value this process is called asset mispricing.
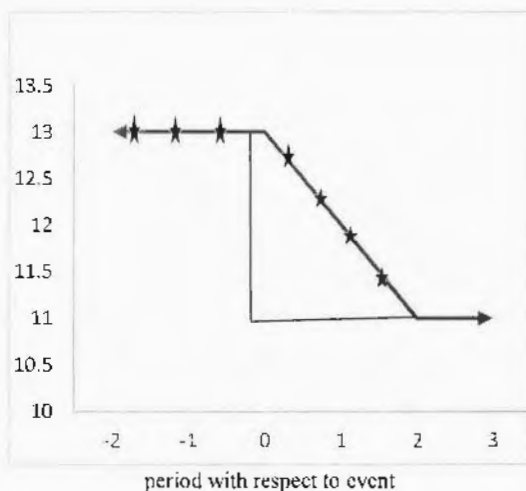
Due to the asset mispricing investors perceive past pattern of price and tries to sell losers as they predict that in future the market value of losers decrease more. Consequently, they started to buy winners stock with a hope that in future winners provides them higher capital gain and excess return. Because of investors' behavioral tendencies, the demand for winner stock increases and demand for losers stocks decreases. Therefore, price of winners move in upward direction and price of losers move in downward direction. This mechanism gradually allows assets to appropriately represent their market value and correct asset mispricing in stock market.

The pattern of prices can be determined by news content and stock reference price comparative to current price which investors set in their minds. In general, the impact of bad news travel gradually in stocks that are trade at capital losses and as a result causes negative price movement and post event negative drift. On the other side, good news travel gradually in stocks that are trade at capital gain and as a result causes positive price movement and post event positive drift. Figures 3 and 4 show reaction to news and gradually asset mispricing correction mechanism after under-reaction and over-reaction to news (Franzzini, 2006).

Figure 3 exhibits the stock prices behavior in response to negative news. Figure 3 exhibits downward movement of stock prices. Primarily stock prices stay at Rs13 at time period 0. However, after the disclosure of bad news stock prices show negative drift and stand at Rs11 at time period 3.This downward drift in prices indicate capital loss that befall on the investors. Figure 4 shows the behavior of stock prices in response to positive news. Figure 4 exhibit upward movement of stock prices primarily stock prices stand at Rs11 at time period 0 before the disclosure of news, as good news about stock revealed the stock

prices show upward drift. As well as, stock prices stand at Rs13 in 3 time period. This upward movement in prices indicate capital gain that happen to investors.

Figure 3: Negative News Reaction   **Figure 4: Positive News Reaction**
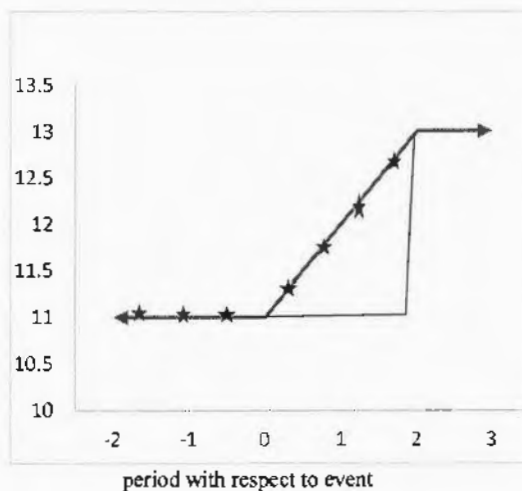
— Trading stock with capital gain ★ Trading stock with capital loss   — Trading stock with capital gain ★ Trading stock with capital loss

Note: The figures 3 and 4 represents stock prices negative as well as positive response to news. In addition, it also exhibits slow post event drift of stock prices after undergo from under and over reaction to news. Period relative to event take on x-axis and stock prices take on y-axis.

However, the stocks steadily get back at their market value after under and over reaction to news. In addition, as asset mispricing get corrected it allow momentum to prevail in the stock market (Sakr *et al.*, 2014). Momentum allow investors to perceive stock return pattern and believe that past pattern will continue in near future. Therefore, to realize capital gain investors' purchase past winner stock and sell past loser stocks. This behavior of investors creates stronger demand for winners and weaker demand for losers so that winners supply start decreasing and losers supply start increasing. Thus, it allow stock prices to converge back to their equilibrium point and assets successfully represents their actual market value.

27

Chapter 3

Literature Review

Disposition effect is the tendency of investors to trade stocks that increase in value and keep stocks that decrease in value. Investors are keen to realize capital gain and reluctant to realize capital loss. Over the past years by using diverse theoretical framework, methodologies and data base many studies try to examine the presence of disposition effect across the world (Shefrin and Statman, 1985; Weber and Camerer, 1998; Odean, 1998; Ferris *et al.*, 1988; Shapira and Venezia, 2001; Grinblatt and Han, 2005; Oehler *et al.*, 2003; Frazzini, 2006; Ben-David and Hirshleifer, 2012; Kong *et al.*, 2014; Sakr *et al.*, 2014; Ashraf *et al.*, 2014; An, 2016 and Hmida, 2017). The key finding emerges from these studies is that there is persistence of disposition effect in many countries like US, Canada, Japan, Pakistan and Tunisia. Moreover, the disposition effect exist in financial markets as well as its existence in real estate market is also remarkable.

3.1. Concepts for Disposition Effect

There are generally four concepts which help to understand disposition effect. They include the prospect theory, mental accounting, avoid regret and mean reversion (Shefrin and Statman, 1985).

3.1.1. Prospect Theory

Prospect theory is main theoretical base for disposition effect developed by Kahneman and Tversky (1979). Prospect theory describes that investors take decisions constructed on the potential utility of gains and losses relative to ultimate outcome, and

in term of potential gains and losses compared with reference price. This stage .... as editing stage. Second stage is evaluation stage in which an investor implies an S-shaped value function. In S-shaped value function concave portion shows risk aversion in state of gains and convex portion shows risk lover in state of losses, both gain and loss measured with reference point (Kahneman and Tversky, 1979).

Figure 5: S-shaped Value Function
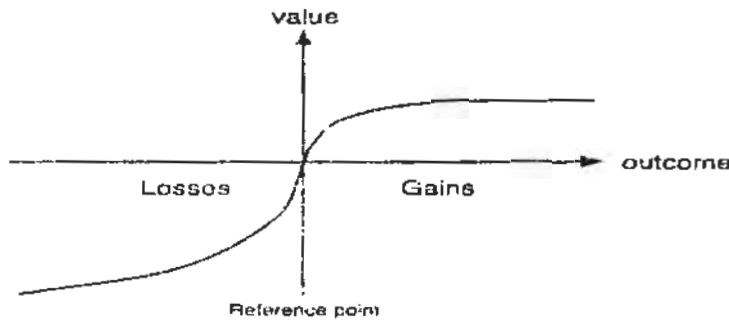
Note: The figure represents S-shape value function, in which gain is represents by concave portion and loss represents from convex portion in Figure 5. Concave portion explains that investors show risk aversion behavior in case of capital gain because they want to realize capital gain as early as possible because future is uncertain and may in future the stocks provide capital gain today may provide capital loss. On the other side convex portion in figure represents that investors are risk seeker in case of loss because they have hope that the stocks provide capital loss today may provide capital gain in future so they get more satisfaction by waiting future.

According to Shefrin and Statman (1985), for each stock position investors sustain a distinct mental account and are eager to maximize S-shaped function as shown in Figure 5. The concave portion explains that investors show risk aversion behavior in case of capital gain because they want to realize capital gain as early as possible. As, future is uncertain and may in future the stocks provide capital gain today may provide

29

investors estimate these gains and losses using certain heuristics. The disposition effect

develops from combination of several features. First, an investor frame all the choice

capital loss. However, convex portion represents that investors are risk lover in case of loss because they have hope that the stocks provide capital loss today may provide capital gain in future so they get more satisfaction by waiting for future. This phenomena occurs in the case of high probability of uncertain risk or loss it is called certainty effect.

The certainty effect states that people exhibits risk aversion for gain and risk lover for losses if probability of certain outcome is low. The investors are risk averse because they feel eager to sell their winning stocks to avoid capital loss. Likewise, investors are risk seeker because they hold their loser stocks in order to give them a chance to recover (Shefrin and Statman, 1985; Weber and Camerer, 1998; Odean, 1998; Thaler, 1999 and Grinblatt and Han, 2005).

3.1.2. Mental Accounting

Mental accounting is another theoretical base for disposition effect it is developed by Thaler (1980). Mental accounting describe people's tendency to organize financial assets in separate psychological accounts. They take reference point and compare the loss and gain over their accounts and follow the track of gain and loss in their mind. Conversely, because investors separately manage these mental accounts, so they may sporadically lose ability to see what is optimal for them. Mental accounting investors have stronger ability to take perfect decisions that provide them optimal outcome in future and that are also support their financial well-being (Ashraf *et al.*, 2014). Therefore, in mental accounting household want to record, analyze, summarize and verify their financial activities. Investors open mental account in their mind for every

30

new share purchased and feel eager to maximize profit by comparing sock purchasing price to its reference price Shefrin and Statman (1985).

3.1.3 Avoid Regret

The third concept for disposition effect is developed by Kahneman and Tversky (1979), Shefrin and Statman (1985), Thaler (1985), and Shiller (1995). Avoid regret states that investors want to avoid emotion of regret by selling their winners stocks and reluctant to sell losers. Regret is the feeling associate with actual knowledge that past alternative decision has better then chosen one. Other component of regret is pride. If stocks gain value, then investors feel pride and when stock lose value investors feel regret. Intense craving to get pride and avoid regret lead to disposition effect (Shefrin and Statman, 1985).

3.1.4. Mean Reversion

The fourth concept for disposition effect explains that prices and returns eventually revert back toward their mean and average value. Mean reversion describes stocks that perform poor will improve, and stocks that perform superior deteriorate in prices. Investors buy a poor performing stock with the hope to increase in its value. However, if stock prices increase more than its average value then it is expected that these prices fall in future.

Investors speed up to sell their winners stocks too early because they have a fear of losing future expected return and hold the loser stocks for longer period because they expect that in future prices may revert back to its average level and even more than average value (Andreassen, 1988). However, the presence of mean reversion denies the

31

EMH, which states that market participants do not have adequate authority to forecast stock price movement from prior movements. If investors are able to predict prices from past price pattern then they are able to earn excess profit from their trading strategies (Mayost, 2012).

3.2. Prospect Theory/Mental Accounting Framework

The prospect theory and mental accounting (PT/MA) framework seem best to enlighten the asset market anomalies. Further, (PT/MA) framework successfully examines the persistence of disposition effect and momentum strategies in financial markets (Kaustia, 2004; Zuchal, 2001; Grinblatt and Han, 2005 and Frazzini, 2006). The PT/MA framework required because of following reasons.

First, the prospect theory enables us to explain about which capital gains and capital losses the investor care about that change their total wealth (Barberis and Haung, 2001). For this purpose mental accounting provides provision to locate reference price in order to compare capital gain and loss (Thaler, 1999). Second, the prospect theory/mental accounting framework deliberated the concept of loss seeking and avoiding regret (Hirshleifer, 2001 and Thaler, 1999). Third, prospect theory/mental accounting framework shows risk aversion by employing S-shaped value function. The value function infers that winner stocks always desire in a smaller amount compare to loser stocks and there is always larger craving for losers stocks (Shefrin and Statman, 1985).

3.3. Empirical Evidence

3.3.1. Disposition Effect

Investor's attitude to trade winners stocks quickly and unwilling to sell losers stocks is the investor behavior which is first examined by Shefrin and Statman (1985) in their study. This investor's behavior called disposition effect opens door for many researchers to see the existence of it in diverse markets and among various investors. In past years, the disposition effect has been documented in number of researches either it exist or if exist at what intensity it exist in diverse markets and scenario (Ashraf *et al.*, 2014). The study of Lakonishok and Smidt (1986) examine higher volume for winners stocks and lower volume for losers stocks. Ferris *et al.* (1988) use the data of 30 US stocks and find interdependence among stocks current volume and previous days that shows past stock prices higher (lower) than current stock prices it indicate the disposition effect.

Hillman (1997) uses the data of 10,000 transaction of participants in a game which is conduct by German saving banks in which 400 different stocks are used which are listed in German stock exchange over the period of 9 weeks. He finds the disposition effect in most of the individual investor biases. Case and Shiller (1988) use interview approach and take interview from home buyers in area where the prices of house increase or stay low and they find that households show disposition effect they feel higher satisfaction to trade houses when price increases rather than falling. Weber and Camerer (1998) use experimental approach and find the presence of disposition effect. Odean (1998) uses data of 10,000 randomly selected households from discounted brokerage house and after analyze the frequency of selling winners and keeping losers

33

they able to conclude that people show disposition effect. Shapira and Venezia (2001) use Israeli brokerage data and show that individual as well as professional investors' show disposition effect. Oehler *et al.* (2003) use experimental study in which experiment conduct with graduate students and find presence of disposition effect in securities trading.

Dhar and Zhu (2006) take into account the variables that determine disposition effect like demographic, social and economic variables and finds that rich investors as well as those investors employed in professional jobs show low effect of disposition effect. In addition the investors that have less working and teaching experience shows high disposition effect. Chen *et al.* (2007) use five year data set for brokerage account in China and finds presence of three investors biases in China which include investor's overconfidence, past returns are indicators for future returns and disposition effect recognize winners not losers. Farino *et al.* (2015) examine the presence of individual investors' disposition effect in Australian equity market and also find that disposition effect present in all group of investors even in the last trading month when investors have opportunity to realize loss in order to get tax welfares.

Heimer (2016) finds that social interaction leads towards the disposition effect as well as easy availability to social network double the disposition effect in its magnitude. In addition there is interrelated (correlated) level of disposition effect between investors which connected them with each other through social network. Antti (2016) uses twenty years data of Finland and by applying the methodology of Cox proportional model for large data set, conclude that magnitude of disposition effect is higher for capital gain and lower for capital loss. Ploner (2017) uses the experimental

approach and finds that disposition effect strongly persist when the choices are made through following a logic or sequence. On the other hand, if choices are scheduled, there is reversal of disposition effect and at that stage losers are less desirable to hold.

Groot (2017) uses long data set of Belgium from year 2001 to year 2014, in country the capital gain consider to be tax free and capital loss subjected to tax. The study consider five types of investors including private, institutional, mutual funds, investors who take advice and professional investors. Their study results show presence of disposition effect in all type of investors even when capital gain is tax free and capital loss is tax restricted. Elizabeth *et al*. (2017) consider the common behavior in farms where harvest crops fundamentally stored and trade them throughout the whole year. The study uses experimental approach in which 112 German farmers take part and they are aware with the underling price movements. The results show presence of disposition effect in the trading decision of farmers besides this farmer behavior have impact on whole economic situation as well as agriculture area. Li *et al*. (2017) results of stocks trading experiment show that women exhibits disposition at a higher rate than man. Because women's are more risk averse, avoid regret and show higher disappointment as compare to man. Therefore women's are fail to pursuing winners stocks and cutting losers stocks.

Ashraf *et al*. (2014) examine the disposition effect, holding periods and illiquidity of PSE over a period from 2008 to 2012. They find the positive relation among and holding periods. As well as they find that because of the market illiquidity people prefer to hold the securities in order to avoid transaction cost this behavior of investors leads toward disposition effect in PSE. Therefore, it can be said that

35

disposition effect in PSE is evident due to transaction cost. Raza and Mohsin (2014) extend the Shefrin and Statman (1985) framework to examine the disposition effect mediating impact on mental accounting, avoid regret, portfolio management and self-control. Their results establish that disposition effect play important role as mediator between self-control, mental accounting, avoid regret and portfolio management. As well as the disposition effect put significant impact on fund manager decisions, on the other hand investors have fine knowledge about tax consideration. Aftab *et al.* (2016) use the data of Pakistan Stock Exchange and consider the impact of disposition effect on asset pricing over sample period of seven years. By incorporating regression approach they find that Pakistan Stock Exchange is dominated by disposition effect and disposition effect shows inverse relationship with expected stocks returns. Therefore, we can say that the disposition effect reduce the real earning.

3.3.2. Momentum Effect

The momentum effect anomaly first determine by Jegadeesh and Titman (1993). Momentum effect is considered as foremost dare to efficient market hypothesis. It shows that investors able to perceive past pattern of the stock returns. Therefore, it implies that the stocks that gains value in past continues to be outperform the stocks that loses in value over intermediate horizons. However, investors buy stocks that have high current returns and sell stocks that have low current returns yields as well as the impact of higher returns are statistically remarkable (Jegadeesh and Titman, 1993). There are several studies conducted in the USA that find the stronger effect of intermediate momentum like momentum over intermediate term in which past winners beat past losers for intermediate time horizons (Jegadeesh and Titman, 1993; Schiereck

36

et al., 1999). Rouwenhorst (1998) uses monthly total return of 2109 stocks and find the significant presence of momentum schemes in 12 European nations. Rouwenhorst (1999) uses data for emerging markets and find momentum profit in 6 emerging markets out of 20. Griffin *et al.* (2003) measure worldwide momentum strategies and find momentum profit in develop countries rather in Asian countries. Hameed and Kusnadi (2002) find no momentum strategies in 6 developing countries. Hong and Stein (1999) examine that investor manage momentum activities profitably by chasing the trend from over and under reaction to news. Sias (2007) finds tax-loss selling and window dressing by institutional investors leads towards the stock return momentum. Dupernex (2007) examines that seasonal trend, size effect and reversion factor in stock prices can lead towards momentum pattern.

Sagi and Seasholes (2007) find the underlying forces of firm's return as growth, revenue and expenses. They use these factors to understand momentum strategies and come up with the conclusion that momentum schemes that include firms having stable growth, low expenses and high revenue development volatility possibilities overtake the traditional momentum schemes over 5% annually. Arena *et al.*, (2008) use large data set of common stocks transacted at NYSE and Nasdaq stock market from period of 1965 to 2002. Moreover, they use the methodology proposed by Jegadeesh and Titman (1993) and observe that returns from momentum strategy for larger idiosyncratic volatility stocks are greater, specifically returns are higher for greater idiosyncratic volatility loser's stocks. As well as the higher idiosyncratic volatility stocks have direct relationship with momentum profits and they also show larger reversal.

Chui et al. (2010) explore the relationship between individualism and momentum strategies by using data of 20,000 individual firms from 41 countries. They find that individualism connected with volatility, volume and momentum schemes. There is presence of momentum mostly all sample countries but insignificant and week in some countries like in Japan and Asian regions. This is because of the fact that behavior of individual across countries may differ. And individuals of different countries exhibits changed behavior in accordance to any news in addition they have different style to interpret any news. Fama and French (2012) aim to explore that whether asset pricing model have the ability to capture effect of momentum and value across international different regions. They examine 4 regions in their study namely Japan, Europe, America and Asia Pacific countries. They find the strong presence of momentum in all districts exclude Japan.

Phua et al. (2010) find the presence of momentum strategies in Australia due to strong seasonal effect that are consistent with institutional window dressing and tax selling hypothesis. Wang et al. (2012) and Antoniou et al. (2013) examine the presence of significant price momentum as well as short term momentum due to investor sentiments, specifically toward a ratio of margin purchase to short-sale and stock market turnover rate. Sometime momentum effect occurs due to media coverage as in the study of Hillert et al. (2014) they explore the correlation among media coverage and the magnitude of momentum by using unique form of data which include 2.2 million articles of firms from 45 US newspapers over the period of 12 years. Their results report that there is standardize relationship between extent to firm's media coverage and intensity of momentum and reversal impact in long run of the firms stocks. Therefore, returns predictability can be higher for those firms which usually get

38

high media coverage. Wang and Xu (2015) find the robust and significant relationship between volatility and momentum. Moreover they find that volatility link with default risk predict momentum profitability.

Martins *et al.* (2016) perform the detailed analysis for the momentum strategies in Germany and use the methodology proposed by Jegadeesh and Titman (1993) over 16 momentum strategies with 16 years sample period. Their results show the existence of profitable momentum schemes in German stock market in addition, momentum strategies based on short run holding period provide higher returns to investors. And the firms having small market value give higher momentum profit. Chen and Lu (2017) provide empirical evidence for the model of slow diffusion which is documented by Hong and Stein (1999). They select the stocks in which the process of diffusing of information is slower they collected the information about stocks from option markets. Their results indicate that momentum approaches are gainful for the stocks that have slower rate of information diffusion or momentum profits are intensive at the initial phase of information cycle. As the information diffusion continues and predicted by the investors it benefit to better understand momentum as well as it furthermore expand momentum profits. Nnadi and Tanna (2017) explore momentum as well as contrarian effects in BRICS countries. They show that Indian stock market has the existence of strong momentum effect. On the other hand there is contrarian effect persist in China and Brazil for short run and for intermediate run and long run there is presence of momentum profits. In Russia momentum profits are insignificant.

The stocks that exhibit the momentum effect over the period of first six months consider to be exhibit no reversal pattern in long term[9]. On the other hand, the stocks that do not exhibit momentum profit over the period of first six months show momentum reversal during 12-24 months. However, the stocks that face momentum effect during intermediate term mainly do not exhibit significant reversal effect. Besides, the stocks display no momentum effect over intermediate term show significant reversal effect (Conrad and Yavuz, 2016). Andrei and Cujean (2017) use time series momentum and momentum reversal concept that is grounded with the model of rational expectation. They indicate the basic condition to persist momentum in this framework is that the information must be float at the higher intensity. Moreover, this condition can be satisfied with the mouth communication mechanism in addition this mechanism creates short run momentum and momentum reversal on long run basis.

In Pakistan there are various studies tries to explore significant momentum profit existence in different markets setup. Tauseef and Nishat (2016) examine the momentum and its elements by using data from 2001-2015 from Pakistan Stock Exchange. They divided their data set in to two sub sample from 2001-2007 and from 2009-2015. Their results show the presence of positive momentum profit for whole sample duration. Their results show diversification in two sub sample. In first sample there is stable economic progress, low inflation and better governance which allow momentum portfolios to earn significant returns. On the other side, in second sample data there is unstable economic growth, increasing inflation and poor governance which allow momentum portfolios to earn negative returns. Khan *et al.*, (2016)

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[9] The presence of stock returns negative correlation implies that the stocks having positive return in past may likely to have negative returns in future. This reverse in return pattern known as momentum reversal effect or overreaction effect (Bondt and Thaler, 1985).

examines the momentum strategies persist in the Pakistan Stock Exchange by using CAPM analysis and 16 momentum strategies. There are 83 listed companies involve in analysis over period of 2007-2014. They find no momentum effect present in the portfolio of winners plus winners minus losers. However, there is presence of momentum effect in loser's portfolios. In sum, their results show low but significant momentum profits persist in PSE.

3.3.3. Disposition and Momentum Effect

Disposition and momentum effects are considered to be the active anomalies of financial market. Their presence in any market reject the EMH which state that market efficiently show all the existing information in stock prices and assets are correctly priced. On the other hand, to achieve market efficiency is not possible with the presence of these two anomalies in market. Grinblatt and Han (2005) provide a ground to test these anomalies by developing theoretical model and testable implication and also describe how the momentum in stock prices continues to be exist with the help of deposition effect. They use data of common traded stocks in US over the period of 1799 weeks. Their results repot that disposition effect related to momentum as well as the disposition have the power to drive momentum in US stock market. Frazzini (2006) uses mutual fund data for 12 years and apply prospect theory/mental accounting framework and their results show that disposition effect reflect under reaction to news leading post announcement drift in prices.

Hur *et al*. (2010) utilize Grinblatt and Han (2005) model to explore the relationship among momentum and disposition effect in case of individual investor. Their results report that disposition capability to explain momentum become higher with the existence of individual investor's occurrence in stocks. Li and Yang (2013) develop

general equilibrium model prior studies use partial equilibrium in order to study implication for prospect theory and find that diminishing sensitivity shows disposition and momentum effect. They also find positive relation among returns and volume.[10]

Sakr *et al.* (2014) use stock exchange data for seven years and apply the methodology of Grinblatt and Han (2005). They conclude that disposition effect not related to momentum in Egyptian stock market. Kong *et al.* (2015) use 14 years firm level data and use the methodology of Grinblatt and Han (2005). They find that in Chinese stock market momentum effect do not derived from disposition effect.

An (2016) uses US stocks data with the concept of V-shaped disposition curve and explains well document refinement of disposition effect. This result show that due to higher selling propensity in response to unrealized capital gain causes selling pressure which create predictability of stock returns. In contrast, Birru (2015) uses investor level data and argue that disposition effect not exist during a time of stock split but momentum still present in its robustness foam which show that disposition is not only the reason to derive momentum in security market.

Hmida (2017) explores the relationship among disposition effect and momentum in Tunisian stock market. The results show the existence of disposition effect in long run but not in short as well as intermediate term. Beside, momentum effect also derive by disposition effect for the whole sample period. However, these results vary across different markets like in manufacturing market stocks future prices are positively correlated with past prices and disposition effect develops momentum. However, in case of financial and services market there is momentum reversal due to disposition

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[10] Ben-David and Hirshleifer (2012) use individual trading data and find that selling propensity increase with the increase in magnitude of profit and loss.

effect which implies negative correlation between stocks future as well as past prices. Zaremba and Shemer (2017) consider and explain the momentum strategies in new dimensions like moving averages, time series and intermediate momentum and sorting them on book to market value, liquidity and size in order to expand momentum strategies. Their results exhibits that momentum develop due to the following factors like disposition effect, positive feedback trading, myside biases[11], focalism[12] and herding behavior.

3.4. Concluding Remarks

From the emergence of momentum and disposition effect there are rich studies in literature that tries to explore the presence of disposition effect and momentum in diverse market by using different techniques, methodology and sample period across the world. Literature can be divided in two parts the first part provide the evidence for the existence of disposition effect and momentum in different economies. However, second part provide evidence for their non-existence in financial as well manufacturing sector of different economies. Grinblatt and Han (2005) get motivation from the framework of prospect theory/mental accounting and proposed a methodology to inspect an association among disposition effect and momentum.

After their study, many other study use or extend their model and tries to know that whether disposition effect have potential to derive momentum in stock market. Some studies find that disposition effect have power to drive momentum in stock market of USA and Tunisian (Grinblatt and Han, 2005; Hmida, 2017). On the other hand, other studies find that disposition effect do not have magnitude to derive

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[11] Myside biases also called confirmatory biases
[12] Focalism also called anchoring

momentum in stock market of Egypt and China (Sakr *et al.*, 2014; Kong *et al.*, 2015). The diversity in results is due to the difference in behavioral tendency, attitude, regulations, policies, political influence as well as economic condition that are varies from country to country.

3.5. Gap in Literature

From the review of literature we conclude that investor's preferences and trading strategies have potential to create equilibrium price deformation in security markets. Market anomalies are the market irregularity and abnormal behavior of stock returns. There are several studies that analyzed these financial market anomalies in diverse markets across the world. In Pakistan, there are several studies that have tried to examine disposition and momentum effect (Rehman and Mohsin, 2012; Shah and Shah, 2015; Tauseef and Nishat, 2015; Aftab et.al, 2016; Tauseef and Nishat, 2016; Khan *et al.*, 2016). However, these empirical studies are limited to examine the separate impact of disposition and momentum effect. There is substantial lack of study to inspect the relationship between disposition and momentum effect at the same time. Therefore, it would be valuable to see the relationship among disposition and momentum effect simultaneously.

The study contributes in the literature from subsequent aspects. First, PSE is diverse from advanced markets where the methodology of Grinblatt and Han (2005) formerly applied to see the association between disposition and momentum effect. Second, the study focus on the PSE during period from 2000 to 2016, as growing emerging market that suffer from diverse economic and financial stages and still tries to get the stable level of efficiency as well as superiority like developing economies (Rabbani *et al.*, 2013). Third, there is significant dissimilarity in quality of information

44

between developed and emerging economies. In emerging countries investors show irrational behavior and there is difference in the magnitude of momentum and disposition effect strategies (Sakr *et al.*, 2014).

Fourth, this study fill up the research gap in Pakistan by conducting a worthwhile research in order to examine whether there is presence of momentum strategies in PSE and whether disposition effect have adequate power to drive momentum in PSE. Fifth, we observe the correlation among disposition and momentum effect in bull and bear market for more desirable and effective justification. Because, up and down markets have potential to transform the behavior of market participants.

Chapter 4

Hypothesis Construction, Methodology and Data

4.1. Introduction

This chapter includes three sections. Section 4.2 constructs hypotheses for the study in order to inspect the relationship among disposition and momentum effect as well as under bull and bear market trends. Section 4.3 discusses the methodology and its theoretical and empirical implications. Section 4.4 discusses data collection and sources.

4.2. Hypothesis

To observe the relation among disposition and momentum effect in PSE we proposed the Grinblatt and Han (2005) methodology. The disposition effect can be examine by unrealized capital gain and loss as well as unrealized capital gain (loss) is correlated with historical returns. On the other hand, historical returns consider to be clamorous proxy for unrealized capital gain (loss) and weak forecaster of expected returns. Consequently, it is recommended that unrealized capital gain (loss) for disposition investors must be uniform for expected returns (Grinblatt and Han, 2005).

For this purpose, Grinblatt and Han (2005) recommend that capital gain or loss for investors should be statistical significant for future returns. The capital gain and loss determine from the past return and its volume pattern. Thus, they suggest that on average capital gain and loss assume to be good forecaster of future returns compare with historical returns. To investigate the interconnection among disposition effect and

momentum, we attempt to see the correlation between unrealized capital gain and historical returns for this purpose we examine following hypothesis.

H_1: The unrealized capital gain is positively related with past returns. There is increase in unrealized capital gain as past return increases.

Grinblatt and Han (2002, 2005) propose the idea, that the behavior of disposition inclined investors' diverse form ordinary rational investors. The disposition inclined (prospect theory/mental accounting) investors have tendency to trade winners and unwilling to trade losers which generate disposition effect. For instance, the increase in magnitude of disposition based trading strategies generates the greater spread between shares market price and fundamental value. The expected return positively increases with unrealized capital gain that shows the presence of momentum in stock returns. After controlling the effect of past returns investors utilize capital gain and loss to forecast future returns. We construct study second hypothesis according to the study of Grinblatt and Han (2005).

H_2: The expected return of stocks increases with unrealized capital gain and vice versa.

The intermediate momentum have stronger effect on returns as predicted by Grinblatt and Han (2005). The study of Jagadeesh and Titman (1993) provided supporting evidence and they find that disposition effect seem to be related with momentum. Moreover, the impact of disposition effect consider to be vanish as the variable of capital gain is controlled. Study further hypothesis are as follow.

H₃: There is a presence of intermediate momentum effect. The past pattern will followed in near future. Past winners continue to be outperform whereas past losers continue to be underperform.

H₄: The effect of intermediate momentum vanishes as the capital gain is controlled with the presence of momentum in stock returns.

4.3. Methodology

4.3.1. Theoretical Model

The study of Grinblatt and Han (2005) assuming the presence of two categories of investors in the market. First category of investors termed as rational investors and the other category of investors termed as disposition inspired (prospect theory/mental accounting) investors. Rational investors are those who take financial decision on the basis of their rationale thinking that provide higher level of utility to them. On the other hand, disposition inspired investors are those who show risk aversion in case of capital gain and risk lover in case of capital loss. This behavior of investors leads toward the disposition effect by creating a spread between stocks equilibrium value and intrinsic value. In addition, it also underreact (overreact) to news and creating momentum in stock profits.

After assuming the presence of both rational as well as disposition investors, Grinblatt and Han (2005) proposed stable asset pricing model that infers in what manner the ordinary price path effected with the presence of disposition motivated

investors, that are subjected to follow prospect theory/mental accounting demand function. It can be denoted as:

$$D_t^{PT/MA} = 1 + b_t[(F_t - P_t) + \lambda(RP_t - P_t)] \tag{4.1}$$

where, F_t represents stocks fundamental value, P_t represents market price, RP_t represents reference price, b_t is the slope of rational element for the demand based function and λ measure magnitude of demand apprehension caused by disposition (prospect theory/mental accounting) motivated investors. This demand function considers the effect of demand expansion of stocks that are selling at loss ($RP_t > P_t$) as well as demand reduction for stocks that are selling at gain ($P_t > RP_t$).[13] According to the theoretical model of Grinblatt and Han (2005) there is increase in the stocks expected returns with the increase in magnitude of unrealized capital gain and portion of shares traded. It can be represents as:

$$E_t\left[\frac{P_{t+1} - P_t}{P_t}\right] = (1 - w)TR_t \frac{P_t - RP_t}{P_t} \tag{4.2}$$

Where, TR_t is the turnover ratio of stock, P_t represents market price, RP_t represents reference price of a stock and $g_t \equiv \frac{P_t - RP_t}{P_t}$ is the comprehensive unrealized capital gain (loss). w = weight signifies the presence of investors subjected to disposition effect in the economy. Equation 4.2 demonstrates that there is direct relation among stocks unrealized capital gain and expected return. Thus, if there is increase in unrealized capital gain it leads to increase in stock future returns.

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[13] This phenomena occurs with the existence of disposition prone investors in financial market who are motivated with prospect theory/mental accounting framework.

4.3.2. Reference Price

To analyze the existence of disposition and momentum effect in PSE we have to calculate capital gain (loss). For the calculation of capital gain we first determine the reference price and compare it with stock current price and examine whether stock suffering from gain or loss. This step is considered to be necessary because disposition inspired investors first compare the stocks existing price with stocks reference price to understand whether stocks on average suffering from gain or loss. We calculate reference price at start of week t, by taking five years data before week t as in the study of Grinblatt and Han (2005). It can be shown as follow:

$$RP_t = \frac{1}{k} \sum_{n=1}^{260} \left(TR_{t-n} \prod_{\tau=1}^{n-1} [1 - TR_{t-n+\tau}] \right) P_{t-n} \tag{4.3}$$

TR_t represents turnover ratio of stocks at the time period t, k is the constant that assign weight equal to one to historical price. It is equals to:

$$k = \sum_{n=1}^{260} \left(TR_{t-n} \prod_{\tau=1}^{n-1} [1 - TR_{t-n+\tau}] \right)$$

The P_{t-n} represents weight for the probability of stocks purchase on time t-n that is not traded yet. Furthermore, the weight drop geometrically over time that infers by keeping other element fixed recent trading prices put more weight on reference price. The study of Brown *et al.* (2006) indicate that by giving more value to current prices as compare to previous price have the ability to capture the effect of homoscedasticity persuaded by the approach of Odean (1998).

4.3.3. Unrealized Capital Gain and Loss

We compute the unrealized capital gain the same way as in Grinblatt and Han (2005) at beginning of time t. It is as follow:

$$g_t = \frac{P_{t-1} - RP_t}{P_{t-1}} \tag{4.4}$$

In equation 4.4, P_t represents stock price at time t. RP_t represents reference price at time t. We use stock prices lagged by one week P_{t-1} in our calculation in order to avoid market microstructure effect[14]. Moreover, this proxy offers suitable estimator of unrealized capital gain (loss) (Frazzini, 2006).

4.3.4. Fama and Mac-Beth (1973) Regression

We apply cross-sectional Fama and MacBeth (1973) regression method to estimate study models, as it is deliberate to be best proficient approach in finance that offers method to run cross-sectional regression and approximation of standard error. Fama and Mac-beth (1973) regression technique is used for the estimation of the parameters for asset pricing models. Asset pricing theories commonly incorporate risk elements in order to provide explanation for asset returns. These factors mainly contain macroeconomic elements as well as financial elements. Thus, Fama and Mac-Beth (1973) regression method is useful to examine how these elements define asset returns.

This method approximate the beta and risk premium for risk element that are predicted to conclude asset prices. Moreover, the model evaluate the parameters in two

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[14] Market microstructure deals with the issue of market design, price establishment, information announcement, trading cost and investor's behavior. Example for market microstructure are bid-ask bounce.

stages. First, assets are regress against predicted risk element to determine betas associated with that risk element. Second, it determine the risk premium by regressing all assets returns over a fixed time period against the determined betas. After that it averages the coefficients, formerly for each element, to provide premium that are predicted to experience due to every risk element over time. Therefore, by inspecting the t-statistics of each coefficient we examine the significant effect of diverse variables over expected return.

4.4. Models for Empirical Analysis

The study main regression equation is as follow in which weekly unrealized capital gain regress over past stock return, turnover ratios and firm size as proposed by Grinblatt and Han (2005).

$$cg_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 Avt1_{-4:-1} +$$
$$b_5 Avt2_{-52:-5} + b_6 Avt3_{-156:-53} + b_7 Size_{t-1} + e_t \qquad (4.5)$$

Where;

Cg_t	unrealized capital gain (loss)
$Ret1_{-4:-1}$	· past short term cumulative return from week t-4 through t-1
$Ret2_{-52:-5}$	past intermediate term cumulative return from week t-52 through t-5
$Ret3_{-156:-53}$	past long term cumulative return from week t-156 through t-53
$Avt1_{-4:-1}$	average weekly turnover from week t-4 through t-1
$Avt2_{-52:-5}$	past average weekly turnover from week t-52 through t-5
$Avt3_{-156:-53}$	past average weekly turnover from t-156 through t-53
$Size_{t-1}$	firm size at the end of time period t-1

To know that what determine capital gain variable as well as to see association between unrealized capital gain, past returns, average weekly turnover and firm size we regress 4.5 model. By estimating the following equation we are able to test our first hypothesis that is unrealized capital gain is positively related with past returns. There is increase in unrealized capital gain as past return increases. After keeping in view coefficient values and their t-statistics we accept as well as reject our first hypothesis.

$$r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + e_t \qquad (4.6)$$

In this model we regress weekly stock return (r_t) on past three periods cumulative returns. In addition, past cumulative returns over three time period use to control the return effect (Debondt and Thaler, 1985; Lehman, 1990; Jagdeesh and Titman, 1993). This model let know that whether any return pattern followed in stock market. By testing the following equation we able to test our third hypothesis that is, there is a presence of intermediate momentum effect. The past pattern will continue in near future. After examine coefficient values and t-statistics we accept or reject our third hypothesis.

$$r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} +$$

$$b_4 Avt_{t-1} + e_t \qquad (4.7)$$

$$r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} +$$

$$b_4 Avt_{t-1} + b_5\, Size_{t-1} + e_t \qquad (4.8)$$

In models 4.7 and 4.8 we regress weekly stock return (r_t) on past cumulative returns, firm size and average weekly turnover. We add average weekly turn over and size as controlled variable to control the effect for volume and firm size (Lee and

Swaminathan, 2000). Unrealized capital gain variable excluded from these models to see weather after exclusion of unrealized capital gain intermediate momentum effect eliminate as well as whether there is reversal of returns over the three past horizons and persistence of size effect as well as volume effect in PSE.

$$r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 cg_{t-1} +$$
$$e_t \hspace{8cm} (4.9)$$

$$r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} +$$
$$b_4 Avt_{t-1} + b_5 size_{t-1} + b_6 cg_{t-1} + e_t \hspace{3cm} (4.10)$$

In these models we include unrealized capital gain as independent variable in regression to see the longer effect of intermediate momentum. Moreover, we regress weekly stock returns (r_t) on past three time horizon cumulative returns, average weekly turnover, firm size and unrealized capital gain. By testing the 4.9 model we are able to test our second hypothesis that is expected return of stocks increases with the increase in unrealized capital gain. After testing the 4.10 model we are able to test our last hypothesis that the effect of intermediate momentum vanishes as the capital gain is controlled with the presence of momentum in stock returns. After examine the coefficient values and t-statistic we are able to accept and reject or last as well as second hypothesis.

4.4.1. Description for Model Variables

In our models dependent variable is weekly return of stock and independent variable is size, volume, unrealized capital gain (loss) and historical return. Unrealized capital gain is used as dependent variable in equation 4.5 to see its association with past

returns, average weekly turnover and firm size. Stock prices use in order to calculate weekly return $[r_t = \frac{p_t - p_{t-1}}{p_{t-1}}]$ that is denoted by $r_{t-t2; \, t-t}$ and past cumulative return $[r_c = \prod_{i=1}^{n}(1 + r_i) - 1]$ for three time periods which included short term cumulative return (Ret1$_{-4:-1}$), intermediate cumulative return (Ret2$_{-52:-5}$) and long term cumulative return (Ret3$_{-156:-53}$). We take three time horizons to control the effect of returns as refer by Debondt and Thaler (1985), Lehmann (1990) and Jegadeesh and Titman (993). To control the effect of volume we take average weekly turnover (weekly turnover $\div$ no of outstanding shares) for period of short term, intermediate and long term (Avt1$_{-4:-1}$, Avt2$_{-52:-5}$, Avt3$_{-156:-53}$) as mention by Lee and Swaminathan (2000). Size$_{t-1}$ represents firm size for which we use logarithm of market capitalization as proxy. Market capitalization is the most market oriented proxy for firm size among all the proxies discussed in literature. As well as market capitalization consider as more progressive and forward looking proxy for firm size (Dang and Li, 2015).

4.5. DATA

4.5.1. Data Collection and Data Sources

Our study sample data include all stocks that are listed in PSE. Sample data in this study contains weekly data for closing prices, shares outstanding, shares trading volume and market capitalization. The study covers a 17-years period from January 2000 to December 2016. This study allows free entrance and exist for firms in the data. We collected data from data portal of PSE official cite. Data obtain is used to estimate stocks weekly returns, past cumulative returns over short, intermediate and long horizons (Ret1$_{-4:-1}$, Ret2$_{-52:-5}$, Ret3$_{-156:-53}$), average weekly turnover over past three horizons (Avt1$_{-4:-1}$, Avt2$_{-52:-5}$, Avt3$_{-156:-53}$), reference price for stocks and market

capitalization logarithm that is used as a proxy for firm size. Capital gain is calculated by taking difference between stock market price that are lagged by one week and reference price.

Chapter 5

Empirical Results

The previous chapter represents the hypothesis, theoretical framework, estimation technique and sample data and sources. This chapter presents the empirical results. Specifically, this chapter mainly divided in to three subsections first section presents the results of return anomalies disposition and momentum. This section objective is to provide evidence whether momentum present in PSE as well as it reverse or show non-reversal over the sample period. Does the disposition effect have potential power to derive momentum in PSE? Further, does the persisting momentum in stock market is due to disposition effect? Second section presents detailed relationship among disposition effect and momentum under bulls and bears market trend. Third section presents evidence for the robustness of our empirical results.

5.1. Descriptive Statistics

The summary statistics represents precise overview of the large observations of variables in order to understand a greater set of information and facts as simple as possible. It is useful in providing the economic meaning as well as internal uniformity of sample data set. To estimate the properties of weekly past cumulative returns for three horizons, size and capital gain, different descriptive statistics like mean, standard deviation, median, 10^{th} and 90^{th} percentile is calculated and given in Table 5.1. Mean is the degree of central tendency, median is the middle value of sample data, slandered deviation measure the degree of variation that are present in the variable mean and actual value and percentile is the number where certain proportion of score decrease lower to that percentile.

Table 5.1: Descriptive Statistics

	$r_{-4:-1}$	$r_{-52:-5}$	$r_{-53:-156}$	size	g
Mean	0.0085	0.0750	0.2743	13.761	-0.0069
Median	0	0.0434	0.2373	13.455	-0.0000
SD	1.0467	2.4002	2.4321	2.6216	0.1903
10^{th} Percentile	-0.2158	-0.9555	-1.3683	10.819	-0.0001
90^{th} Percentile	0.2486	1.0293	1.7892	16.833	0.0000

Note: The table shows the summary statistics of time series variable which include past cumulative returns over short, intermediate and long ($r_{-4:-1}$, $r_{-52:-5}$, $r_{-53:-156}$) horizons. Size show logarithm of market capitalization and g represent unrealized capital gain at beginning of time period t-1. Summary statistics for time series variable include mean, standard deviation, median and 10^{th} and 90^{th} percentile.

The means (medians) of past three horizons cumulative returns over short, intermediate and long term are 0.0085(0), 0.0085(0.0434) and 0.2743(0.2373), over the sample period from 2000 to 2016, respectively. The means and medians of cumulative returns remains to be positive throughout sample period is evident to the growth phase of PSE. The growth of PSE leads towards the growth of economy as a whole. However, growth in stock market consider to be essential ingredient for economic growth. Therefore, on long term basis stock market growth increase with the increase in economic growth. The means (medians) for size and capital gain are 13.761(13.455) and -0.0069(-0.0000), respectively. The negative sign with the mean and median of the capital gain indicates that unrealized capital gain undergo from ups and downs during sample period. On average in PSE investors receive capital loss on their investments during sample period. The mean capital gain 10^{th} and 90^{th} percentile include -0.0001 and 0.0000. The mean value is greater than median value of variable past cumulative returns over short, intermediate and long horizon, firm size and capital gain it implies that these variables are positively skewed.

5.2. Empirical Results and Discussion

Table 5.2: Results for the impact of past cumulative historical returns on weekly returns

$$r_t = b_0 + b_1 \text{Ret1}_{-4:-1} + b_2 \text{Ret2}_{-52:-5} + b_3 \text{Ret3}_{-156:-53} + e_t$$

Period	b_1	b_2	b_3	Avg.R^2_{adj}
All	-0.1068***	-0.02941***	-0.0162***	0.1035
	(-16.76)	(-10.69)	(-13.00)	
Jan	-0.1544***	-0.1859***	-0.0639***	0.4951
	(-3.43)	(-13.54)	(-7.89)	
Feb-Nov	-0.1322***	-0.0049***	-0.0079***	0.1258
	(-16.85)	(-2.42)	(-8.30)	
Dec	-0.2352***	-0.0039	-0.0039	0.5783
	(-5.12)	(-0.50)	(-0.87)	

Note: The table shows value of coefficients, t-statistics *in* bracket and average adjusted R^2 of variables for cross-section Fama-Mecbeth (1973) regressions with the data of PSE from January 2000 to December 2016. (*) show coefficients is significant at 10% level. (**) show coefficients are significant at 5% level. (***) show coefficients are significant at 1% level.

Table 5.2 show the results for model in which weekly returns (r_t) at time t are regress over past cumulative returns for three horizons. $\text{Ret1}_{-4:-1}$ indicates short term cumulative returns from week t-4 through t-1, $\text{Ret2}_{-52:-5}$ indicates intermediate cumulative return from week t-52 through t-5 and $\text{Ret3}_{-156:-53}$ indicates long term cumulative return from week t-156 through t-53.

The results exhibit that past cumulative returns over three horizons (short, intermediate and long) are statistically significant in all months throughout the sample period except in December. Coefficient of intermediate term momentum remain negatively significant during all month sample, January only, February to November sample period. This aspect indicates that there is seasonality in momentum persist in PSE. The reasonable justification for seasonality in momentum is the tax loss selling effect that

59

usually occurs in the month of December. Moreover, another reason for seasonality effect is window dressing by institutional investor at the end of quarter months that is more noticeable in the end of year (Sias, 2007). Institutional investors are tax-sensitive and have weak incentive for window dressing. Therefore, the institutional investors face more significant losses as a proportion of their total loss in fourth quarter of year as compare to other three quarter. Likewise tax-sensitive institutional investors realize more losses in fourth quarter as compare to three quarter of following year (Sikes, 2014).

Tax loss selling is the effect in which investor try to sell capital loss investments at the end of year usually in December to offset other investments. Generally investor sell stocks that lose value to realize loss that reduce taxable income. Tax loss selling mainly occurs for the stocks that face decline in prices. On the other hand, decline in stock prices revert back at the start of year generally in January which is called January effect. Suitable reason for the January effect is that investors use year-end cash bonuses that they receive after tax loss selling at the end of year and purchase stocks at the start of following year. Hashmi (2014) finds a positive and a significant January effect in PSE. Zafar *et al*. (2012) find the significant presence of calendar anomaly in Pakistan, existence of anomalies in stock market enable the investor to better predict future return pattern as well as it provide opportunity to investors to beat the market. Haroon and Shah (2013) also find the persistence of seasonality effect in PSE by testing Day-of-the-Week anomaly through OLS regression equation technique. Shamshir and Mustafa (2014) claim that if free-float shares methodology is implemented than there is a chance that day of the week effect can be eliminated from PSE.

Significance of variables show that there is persistence of return predictability in PSE. Further, investors have potential to forecast future returns pattern with the help of past returns pattern. This result evidently support third hypothesis of the study that there is presence of momentum effect (intermediate momentum effect) Past winners continue to outperform whereas past losers continue to underperform. The significant results of third hypothesis are incline with the previous study of Jagdeesh and Titman (1993), Rouwenhorst (1998) and Grinblatt and Han (2005). They find the existence of momentum effect and also stronger effect of intermediate momentum in stock markets. In Pakistan Rehman and Mohsin (2012) find low but significant momentum effect in PSE. Shah and Shah (2015) find momentum existence in PSE and report that momentum strategies that are constructed on investor's attitude to sell past losers and to buy past winners consider to be profitable.

Table 5.3: Results for the impact of past cumulative returns, volume and size on weekly returns

Panel A: $r_t = b_0 + b_1 \text{Ret1}_{-4:-1} + b_2 \text{Ret2}_{-52:-5} + b_3 \text{Ret3}_{-156:-53} + b_4 \text{Avt}_{t-1} + e_t$

Period	b_1	b_2	b_3	b_4	Avg.R^2_{adj}
All	-0.0929***	-0.0362***	-0.0236***	-0.0000	0.5783
	(-6.37)	(-11.98)	(-13.22)	(-0.99)	
Jan	-0.2225***	-0.2209***	-0.0892***	0.0004	0.5863
	(-8.47)	(-14.28)	(-8.23)	(1.10)	
Feb-Nov	-0.1318***	-0.0082***	-0.0125***	-0.0002	0.1502
	(-15.72)	(-3.58)	(-8.33)	(-1.11)	
Dec	-0.2143***	-0.0036	-0.0045	0.0001	0.6306
	(-4.20)	(-0.31)	(-0.85)	(0.25)	

Panel B: $r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 Avt_{t-1} + b_5 Size_{t-1} + e_t$

Period	b_1	b_2	b_3	b_4	b_5	Avg.R^2_{adj}
All	-0.0992***	-0.0295***	-0.0196***	-0.0000	-0.0096***	0.1389
	(-15.03)	(-10.60)	(-11.95)	(-0.94)	(-8.01)	
Jan	-0.1684***	-0.1815***	-0.0625***	-0.0042	-0.0476***	0.6463
	(-4.38)	(-8.08)	(-2.37)	(-0.88)	(-2.49)	
Feb-Nov	-0.1319***	-0.0047**	-0.0102***	-0.0000	-0.0048***	0.1668
	(-15.18)	(-2.04)	(-6.62)	(-1.20)	(-4.85)	
Dec	0.0013	-0.0434	0.0039	-0.0002	-0.0135	0.6734
	(0.01)	(-1.14)	(0.64)	(-0.64)	(-1.95)	

Note: The table shows value of coefficients, t-statistics in bracket and average adjusted R^2 of variables for cross-section Fama-Mecbeth (1973) regressions with the data of PSE from period January 2000 to December 2016. (*) shows coefficients are significant at 10% level. (**) shows coefficients are significant at 5% level. (***) shows coefficients are significant at 1% level.

Table 5.3 Panel A and Panel B show the results for two regression model when the capital gain is excluded from regression model. Weekly returns (r_t) at time t are regress over past cumulative returns for three horizons, average weekly turnover and size. $Ret1_{-4:-1}$ indicates short term cumulative returns from week 4 through week 1, $Ret2_{-52:-5}$ indicates intermediate cumulative return week 52 through 5 and $Ret3_{-156:-53}$ indicates long term cumulative return week 156 through 53. Avt_{t-1} indicates the average weekly turnover lag by one period. Firm size[15] ($Size_{t-1}$) is calculated at end of week t-1. Size and average weekly turnover use as a controlled variable to control the effect of firm size and share volume.

Results in Panel A exhibits that as capital gain is excluded from the regression model there is no evidence for momentum reversal in the PSE. This result of our study is inconsistence with the study of Grinblatt and Han (2005) and Kong *et al.* (2015), they also find the existence of momentum reversal in US as well as in Chinese stock market by using

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[15] Size shows logarithm of market capitalization.

the identical regression model. On the other hand, results show persistence of momentum in PSE which is consistent with the study of Rehman and Mohsin (2012) and Shah and Shah (2015). Tauseef and Nishat (2015) also find the existence of momentum strategies in Pakistan they argue that momentum strategies in Pakistan are time-specific. Therefore, investors consider political and economic factors before taking any financial decision that are based on momentum stratagems. They find significant existence of momentum returns during the period from 2001 to 2008 when the economy of Pakistan enjoy low inflation, high governance and stable growth.

Results in Panel B show negative relationship between weekly returns and average weekly turnover. This aspect of result is consistent with the study of Pathirawasam (2011) and Sakr *et al.* (2015) they also find negative relationship between stock returns and past period trading volume that shows low trading volume stocks outperform stocks with high trading volume. Low volume stocks are usually more risky because of less trading activities in these stocks that leads towards the problem of liquidity. Due to the involvement of higher risk low trading volume stocks provide higher returns in future. The negative sign with the coefficient of average weekly turn over show presence of volume effect in PSE. The reasonable justification for presence of volume effect is due to misspecification of investor about earning in future and illiquidity effect of low volume stocks (Pathirawasam, 2011).

The results in Panel B also shows negative relationship between weekly returns and size except in December. The relationship between weekly returns and firm size shows persistence of the size effect[16] in PSE. Size effect suggests that the firms having small

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[16] Size effect also called small firm effect and small cap effect

market capitalization[17] outperform the high market capitalization firms[18]. Banz and Reinganum (1981) firstly document size effect in their study. They describe that usually small firms on average receive higher return and large firms receive lower returns. Moreover, the small firms' returns increase 10% annually as compare to large firms. Arbel and Strebels (1982) and Amihud and Mendelsons (1986) discuss concept of neglected firms effect and liquidity effect. In addition, the concept of liquidity and neglected firms effect considered to be highly related with the size effect. This is for the reason that usually less information available to investors about small firms and these firms are neglected by the institutional firms, this fact became the cause for low liquidity. Thus, these unpopular and less liquid stocks offer an abnormal return particularly in January (Yalcin, 2010). The small firms usually have more opportunities to grow as compared to large firms and small firms usually traded at lower prices therefore the price have tendency to be appreciates in future as compare to large firms. These result are consistent with study of Banz (1981), Herrera and Lockwood (1994), Hou and Moskowitz (2005) and Sakr *et al.*, (2015) as they find negative relationship between return and size. In Pakistan, Haq and Rashid (2014) find a strong presence of the size effect as well as they find that small portfolio earn excess return as compared to large portfolio.

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[17] Firms with market investment between $300 million and $2 billion are called small cap firms.

[18] Firms with market investment greater than $10 billion are called large cap firms.

Table 5.4: Results for the impact of past cumulative returns, volume, firm size and unrealized capital gain on weekly returns

Panel A: $r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 cg_{t-1} + e_t$

Period	b_1	b_2	b_3	b_4	$Avg.R^2_{adj}$
All	-0.1115***	-0.0301***	-0.0161***	0.0000	0.1155
	(-17.26)	(-11.47)	(-12.91)	(1.22)	
Jan	-0.1493***	-0.1735***	-0.0594***	0.0055	0.5642
	(-2.69)	(-12.44)	(-7.39)	(1.36)	
Feb-Nov	-0.1344***	-0.0052***	-0.0081***	-0.0000	0.1368
	(-16.94)	(-2.79)	(-8.42)	(-0.59)	
Dec	-0.236***	-0.0037	-0.0010	0.0021	0.6328
	(-4.97)	(-0.37)	(-0.15)	(0.53)	

Panel B: $r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 Avt_{t-1} + b_5 size_{t-1} + b_6 cg_{t-1} + e_t$

Period	b_1	b_2	b_3	b_4	b_5	b_6	$Avg.R^2_{adj}$
All	-0.1064***	-0.0303***	-0.0192***	-0.0001	-0.0094***	-0.0000	0.1519
	(-15.46)	(-10.93)	(-11.67)	(-1.09)	(-7.90)	(-0.86)	
Jan	-0.1841***	-0.1736***	-0.0526***	-0.0038	-0.0303**	0.0149***	0.6991
	(-4.20)	(-10.07)	(-2.81)	(-1.13)	(-2.29)	(2.89)	
Feb-Nov	-0.1356***	-0.0048**	-0.0101***	-0.0000***	-0.0050***	-0.0000	0.1791
	(-15.66)	(-2.08)	(-6.56)	(-3.05)	(-4.97)	(-1.43)	
Dec	-0.2891**	-0.1074	-0.1413	-0.0032	0.0702	-0.0034	0.7202
	(-2.21)	(-1.01)	(-0.96)	(-1.03)	(0.87)	(-0.77)	

Note: The table shows value of coefficients, t-statistics in bracket and average adjusted R^2 of variables for cross-section Fama-Mecbeth (1973) regressions with the data of PSE from period January 2000 to December 2016. (*) show coefficients are significant at 10% level. (**) show coefficients are significant at 5% level. (***) show coefficients are significant at 1% level.

Table 5.4 Panel A and Panel B show results of regression model with the inclusion of capital gain variable. In this regression models weekly returns (r_t) at time t are regress over past cumulative returns, average weekly turnover, size and unrealized capital gain. Ret1$_{-4:-1}$ indicates short term cumulative returns from week 4 through 1, Ret2$_{-52:-5}$ indicates

intermediate cumulative return from week 52 through 5 and Ret3$_{-156:-53}$ indicates long term cumulative return from week 156 through 53. Avt$_{t-1}$ indicates the average weekly turnover lag with one period. Size$_{t-1}$ indicates size calculated at the end of week t-1 and cg$_{t-1}$ indicates unrealized capital gain at end of week t-1.

Results in Panel A indicates that as effect of capital gain is controlled, the coefficient of intermediate term momentum are negatively significant except in December that is evident of intermediate momentum effect persistence in PSE. This provides evidence against the study fourth hypothesis that effect of intermediate momentum vanishes as the capital gain variable is controlled with the presence of momentum in stock returns. The result provide evidence that momentum not only derive by disposition effect. As the momentum effect is present in stock returns but disposition effect unable to explain it. Moreover, it can be said that momentum in Pakistan do not drive by disposition effect and there are other factors which allow momentum to persist for longer period of time in PSE. This result is consistent with the study of Birru (2012) he finds that momentum effect is deficient key determinant to derive disposition effect in financial market.

Panel B indicate results when we add average weekly turnover and size in model with other explanatory variables. The results show that there is insignificant negative relation among weekly returns and capital gain. The unrealized capital gain coefficients remain negatively insignificant in all months, February to November and December. Therefore, association among weekly returns and unrealized capital gain provides evidence against study second and fourth hypothesis. It implies that expected return increase with the increase in capital gain and intermediate momentum vanish as capital gain is controlled with the existence of momentum in stock return. These results report that disposition effect

do not derive by momentum effect in PSE. Study results are consistent with the study of Barberis *et al.* (2001), Barberis and Huang (2001), Barberis and Xiong (2009), Kong *et al.* (2015) and Sakr *et al.* (2015).

Table 5.5: Results for the determinant of unrealized capital gain

$$cg_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 Avt1_{-4:-1} + b_5 Avt2_{-52:-5} + b_6 Avt3_{-156:-53} + b_7 Size_{t-1} + e_t$$

Period	b_1	b_2	b_3	b_4	b_5	b_6	b_7	Avg.R^2_{adj}
All	9.2621***	0.2938	1.6313***	0.0066***	0.0124***	0.0187***	-0.5658	0.1899
	(2.68)	(0.81)	(4.53)	(2.78)	(4.15)	(5.23)	(-1.03)	

Note: The table shows value of coefficients, t-statistics in bracket and average adjusted R^2 of variables for cross-section Fama-Mecbeth (1973) regressions with the data of PSE from period January 2000 to December 2016. (*) show coefficients are significant at 10% level. (**) show coefficients are significant at 5% level. (***) show coefficients are significant at 1% level.

Table 5.5 show the results of regression equation in which the capital gain is regressed over past cumulative returns over three time periods, average weekly turnover over three horizons and size. $Ret1_{-4:-1}$ shows the short term cumulative return, $Ret2_{-52:-5}$ shows the intermediate cumulative return, $Ret3_{-156:-53}$ shows the long term cumulative return, $Avt1_{-4:-1}$ shows the average weekly short term turnover, $Avt2_{-52:-5}$ shows the average weekly intermediate term turnover, $Avt3_{-156:-53}$ shows average weekly long term turnover and $size_{t-1}$ shows size at end of time period t-1.

We take unrealized capital gain variable as dependent variable in order to see its association or relationship with other independent variables. Table 5.5 reports that the unrealized capital gain variable is positively significant with average weekly turnover over three horizons and short and long term cumulative returns. Likewise, capital gain is insignificant with intermediate cumulative return and size. The relationship between unrealized capital gain and size shows that the smaller firms achieve more growth from

larger firms and smaller firms realize high past returns in different time period as well as earns higher capital gain as compare to larger firms. The results show supporting evidence for study first hypothesis that unrealized capital gain is positively related with past returns. There is increase in unrealized capital gain as past return increases. The results are incline with the study of Grinblatt and Han (2005), Sakr *et al.* (2015) and Kong *et al.* (2015).

5.3. Bull and Bear Market Trends Analysis

Market trend is the propensity of financial markets to move in certain direction over a definite time period. Market trends can classified into short, intermediate and long term. In addition, when the financial market reacts to the movement of prices related with the investments named as market trend. There are mainly two type of trends in the financial market that termed as bull market and bear market.[19] In bull market trend there is steadily increase in the value of investments over definite period of time. Moreover the prices are rising or predicted to rise and likely to move in upward direction with increase in the volume of shares traded. In bear market trend prices are falling or predicted to fall over a period of time as well as there is downward movement of prices with low volume of shares traded.

In bull market trend there is a stronger demand for stocks and weaker supply for stocks since every investor want to buy more winner stocks as compare to sell them. However, in a result of demand-supply mechanism stock prices start to increase in upward direction. On the contrary, in bear market trend demand for stock is weaker and supply for stock is stronger because investors selling behavior is stronger as compare to buying

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[19] Bull market also termed as up market because stock prices shows upward trend. Bear market also termed as down market because stock prices shows downward trend.

behavior. This attitude of investors in bear market emphasis stock prices to fall in downward direction.

Schultz (2002) defines bear market as a market that shows declining trend. Moreover, in bear market condition there is 13.9% to 90% fall in overall market value and it can also be said that the decline in market value must be greater than 10%. Peterson and Berglund (2007) also define the bear market is the market when there is fall in overall market value and that decline in value is greater than 10%. They furthermore define bull market as the market when there is more than 15% increase in the overall market value. The market trends have the ability to transform the investing behavior of investors. The presence of bull and bear market have significant impact on the investor behavior for endowing in asset allocation (Guidolin and Timmermann, 2004).

Investors modified their behavior according to up and down markets, they trade more in up market trend and less in down market trend. Therefore, bulls market is a time period in which corporate decision provide more fruit for company because investor sentiments also remain positive when market have upward movement. At that time period when there is upward trend prevail in the market, consider to be the best time for any financial institution to issue their new shares. For the reason that at that time demand has stronger impact and supply has weaker impact hence the prices start increases. At that time firm able to trade its new shares at higher selling price compare to normal market condition. In bear market the firms get benefits if they start to repurchase stocks because during bear market prices usually show downward trend (Mehmood and Hanif, 2014).

In 2008 to 2009 there is 25.05% decline in Pakistan Stock Exchange, by the same time annual returns show negative performance at -40.25%. Likewise, the end of 2010 it

increase till 15%. In Pakistan investor's behavior evident to transform with the condition of market trends as well as investor's behavior are diverse in both markets as concluded by the study of (Najaf *et al.*, 2016). Mehmood and Hanif (2014) finds that in Pakistan investor's sentiment shows variation in accordance with bull and bear market trend.

Table 5.6: Results for the impact of past cumulative returns on weekly returns under bull and bear market

Pannel A: $r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + e_t$

Period	b_1	b_2	b_3	Avg.R^2_{adj}
All	-0.1780 ***	-0.0913 ***	-0.0341***	0.3302
	(-20.00)	(-20.81)	(-17.78)	

Panel B: $r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + e_t$

Period	b_1	b_2	b_3	Avg.R^2_{adj}
All	0.0096	0.0586***	0.0148***	0.1963
	(1.18)	(19.59)	(8.09)	

Note: The table show results of bear's market trend in panel A and bull's market trend in panel B. The market trends are established on the basis of stock returns. Positive returns represent bull's market trend and negative returns represents bear's market trend. The table shows value of coefficients, t-statistics in bracket and average adjusted R^2 of variables for cross-section Fama-Mecbeth (1973) regressions with the data of PSE from period January 2000 to December 2016. (*) show coefficients are significant at 10% level. (**) show coefficients are significant at 5% level. (***) show coefficients are significant at 1% level.

Table 5.6 exhibits the results in which past cumulative return are regress under bull and bear market trends separately. Ret1$_{-4:-1}$, Ret2$_{-52:-1}$ and Ret3$_{-156:-53}$ indicates past three horizons cumulative returns. The results indicate that past cumulative returns are statistically significant except short term returns that is insignificant in case of bull market. Coefficient of intermediate term momentum remain negatively significant in bear market and positively significant in bull market during all month sample period.

The results shows positive relationship between weekly returns and past cumulative returns that exhibit that if weekly returns increase it lead to rise in past cumulative returns in bull market. On the contrary there is negative relationship between weekly returns and past cumulative returns under bear market. There is persistence of stock returns predictability which infers that investors able to pursue momentum based profitable strategies in both market trends. The investors are capable to earn abnormal returns from both bull and bear market trends because past returns show significant relationship with weekly returns. Reason for the presence of excess return is due to the fact that, in Pakistan most of the investors are risk averse they tries to avoid any financial loss to their investment. They do so by develop certain profitable strategies in stock market (Najaf *et al.*, 2016).

Investors able to earn excess return in a bear market by investing in negative beta stocks or securities. The returns for negative beta investment have inverse relationship with market condition which implies that if overall market goes down returns of negative beta investment goes up likewise as market condition goes up their returns goes down. Therefore, if the negative beta strategy practiced by investors in bear market there are more chances to earn excess profit, because in bear market trend overall market show downward movement and negative beta investment show upward movement of returns. On the other hand, investors can also be able to earn excess return in bear market by selling losers stocks at the starting point of bear market when prices fall little and buying losers stocks at the peak point of bear market when the prices are very low. In Pakistan, investors like to hold stocks that enjoy high book to market ratio[20] in bear market (Yasir *et al.*, 2014).

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[20] High book to market ratio is also called value stocks.

Investors able to earn abnormal return in bull market by investing in positive beta or stocks and securities having beta greater than 1. The returns from positive beta investments have direct relationship with the market because their value move up and down with the movement of overall market. Therefore, investors receive more returns from positive beta investments in bull market because these investments return correspondingly have rising trend in response with the bull market. Similarly, investors can receive more returns from buying and selling strategy in bull market. However, the investor buying more stocks as the bull market announce because the prices start increase at that point and when market reach at its peak point investors start selling these securities because prices increase more and investor can earn more capital gain.

Table 5.7: Results for the impact of cumulative returns and volume on weekly returns under bull and bear market

Panel A: $r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 Avt_{t-1} + e_t$

Period	b_1	b_2	b_3	b_4	Avg.R^2_{adj}
All	-0.1801***	-0.1099***	-0.0478***	-0.0000	0.3675
	(-19.52)	(-24.31)	(-17.56)	(-0.18)	

Panel B: $r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 Avt_{t-1} + e_t$

Period	b_1	b_2	b_3	b_4	Avg.R^2_{adj}
All	0.0207***	0.0641***	0.0207***	-0.0002**	0.2336
	(2.43)	(18.61)	(8.72)	(-1.95)	

Table 5.7.1: Results for the impact of cumulative returns, volume and firm size on weekly returns under bull and bear market

Panel A: $r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 Avt_{t-1} + b_5 Size_{t-1} + e_t$

Period	b_1	b_2	b_3	b_4	b_5	Avg.R^2_{adj}
All	-0.1785***	-0.1011***	-0.0444***	0.0001	-0.0125***	0.3959
	(-14.66)	(-21.60)	(-19.23)	(1.27)	(-7.63)	

Panel B: $r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 Avt_{t-1} + b_5 Size_{t-1} + e_t$

Period	b_1	b_2	b_3	b_4	b_5	Avg.R^2_{adj}
All	0.0120	0.0680***	0.0231***	-0.0007	-0.0038**	0.2607
	(1.12)	(19.24)	(9.43)	(-1.06)	(-2.07)	

Note: The table show results of bear's market trend in panel A and bull's market trend in panel B. The market trends are established on the basis of stock returns. Positive returns represent bull's market trend and negative returns represents bear's market trend. The table shows value of coefficients, t-statistics in bracket and average adjusted R^2 of variables for cross-section Fama-Mecbeth (1973) regressions with the data of PSE from period January 2000 to December 2016. (*) show coefficients are significant at 10% level. (**) show coefficients are significant at 5% level. (***) show coefficients are significant at 1% level.

Tables 5.7 and 5.7.1 reports the result of regression in which past cumulative

returns and controlled variables that are average weekly turnover and size regress under

bull and bear market trends. The results exhibit that past cumulative returns are positively significant in bull market and negatively significant in bear market. The results show that impact of volume effect remain insignificant in bear market and significant in bull market. The results evidently exhibit that there is no momentum reversal mechanism persist in bull and bear market condition. Because the coefficient of past cumulative returns remain positively significant in bull market and negatively significant in bear market.

The average weekly turnover is negatively significant in bull market and remain insignificant in bear market. Therefore, it shows that trading volume in case of bull market is high as compare to bear market. Moreover, investor's trading activities increases in bull market and decreases in bear market. The following behavior of investor is consistent with the concept of disposition effect that states investors are risk seeker in case of selling losers because they want to give them a chance for recovery in future. However, investors show risk aversion in case of trade losers and they feel eager to trade winners because investors have fear of fall in prices of winners stocks in future hence, they want to realize capital gain instantly. Investors trading behavior diversified according to bull and bear market trends and investors' trade more during upward movement of market trend and trade less during downward movement of market trend. The results are consistent with the study of Cheng et al. (2013) and Mehmood and Hanif (2014).

In table 5.7.1 weekly returns regress over past cumulative returns, average weekly turnover and size. Results indicate that there is negative significant correlation among firm size and weekly returns in both bulls and bears market. The firm size coefficient is greater in bear market as compare to bull market and the negative sign with firm size shows the persistence of size effect in bull as well as bear market trend. Size effect refer as small

capitalization firms tend to outperform large capitalization firms. The small firms perform better in bull market as well as outperformance of small size firms do not disappear even in bear market.

The results indicate that small size firms have the potential to grow under bull as well as bear market. This is because of the fact that small size firms usually endure higher risk and risk increase even more in case of bear market due to decline in overall market value. Therefore, small firm tries to perform well besides in down market. Furthermore, there is no significant greater excess returns are present for large size firm in bear market. The small firms performs better than large firms even in bear market as compare to bull market. Moreover, in bear market small firms show greater residuals compare to large size firms. Our results are incline with the study of Kim and Burnie (2002). They find that small size firms show better performance compare to large firms and this performance remain more significant in bear market as compare to bull market.

The results are inconsistent with the study of Chan and Chen (1991). They find that small firms only outperform large size firm at the expansionary state of economy and generally grow more rapidly at this stage. Therefore, small size firm give poor performance at a contraction stage of economy as compare to large size firm which perform even better at this stage. However, small firms usually have low productivity, low efficiency and high financial leverage which stop them to grow under contraction phase and vast opportunity to grow under expansion and boom phase. Study results are also inconsistent with the study of Bhardwaj and Brooks (1993) they find that there is presence of greater excess return for large size firms in bear market.

Table 5.8: Results for the impact of Past cumulative returns and unrealized capital gain on weekly returns under bull and bear market

Panel A: $r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 cg_{t-1} + e_t$

Period	b_1	b_2	b_3	b_4	Avg.R^2_{adj}
All	-0.1864***	-0.0907***	-0.0328***	-0.0007	0.3482
	(-16.97)	(-15.83)	(-17.20)	(-0.75)	

Panel B: $r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 cg_{t-1} + e_t$

Period	b_1	b_2	b_3	b_4	Avg.R^2_{adj}
All	0.0138	0.0594***	0.0124***	-0.0085	0.2232
	(1.16)	(20.33)	(7.33)	(-1.15)	

Table 5.8.1: Results for the impact of Past cumulative returns, volume, firm size and unrealized capital gain on weekly returns under bull and bear market

Panel A: $r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 Avt_{t-1} + b_5 size_{t-1} + b_6 cg_{t-1} + e_t$

Period	b_1	b_2	b_3	b_4	b_5	b_6	Avg.R^2_{adj}
All	-0.1743***	-0.1000***	-0.0420***	0.0001	-0.0123***	0.0022	0.4162
	(-18.83)	(-24.40)	(-18.23)	(0.92)	(-7.42)	(1.02)	

Panel B: $r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 Avt_{t-1} + b_5 size_{t-1} + b_6 cg_{t-1} + e_t$

Period	b_1	b_2	b_3	b_4	b_5	b_6	Avg.R^2_{adj}
All	0.0101	0.0687***	0.0228***	-0.0000	-0.0044***	-0.0002	0.2891
	(1.06)	(19.47)	(9.05)	(-0.74)	(-2.52)	(-0.82)	

Note: The table show results of bear's market trend in panel A and bull's market trend in panel B. The market trends are established on the basis of stock returns. Positive returns represent bull's market trend and negative returns represents bear's market trend. The table shows value of coefficients, t-statistics in bracket and average adjusted R^2 of variables for cross-section Fama-Mecbeth (1973) regressions with the data of PSE from period January 2000 to December 2016. (*) show coefficients are significant at 10% level. (**) show coefficients are significant at 5% level. (***) show coefficients are significant at 1% level.

Tables 5.8 and 5.8.1 report the results for regression models in which weekly returns regress over past cumulative returns, past average weekly turnover, size and unrealized capital gain. Results exhibit that as capital gain added in model as controlled variable there is significant relationship between weekly returns and past cumulative returns and firm size in bull as well as bear market. Capital gain and average weekly turnover has insignificant relationship with weekly returns. Table 5.8 results exhibit that past intermediate cumulative returns remain significant in bear as well as in bull market implies the presence of intermediate momentum effect. In addition intermediate momentum effect cannot disappear even after controlling the effect of capital gain variable in both market trends.

The table also reports the negative relationship among future returns and capital gain in bull and bear market trends. The following relationship is evident to the statement that expected returns do not increase with the increase in capital gain. These results exhibit that the stocks having unrealized capital gain suffer from low future expected returns as well as the stocks having capital loss suffer from high future returns by keeping other explanatory variables constant. These results are incline with the studies of Barberis and Huang (2001), Barberis and Xiong (2009) and Kong *et al.* (2015). They find that disposition-prone investors are less risk averse when stocks have unrealized capital gain for the reason that future losses covered by the capital gain and they presume lesser expected returns. On the contrary, investors are more risk averse when stocks having capital losses because present loss covered by future capital gain and investors presume higher expected returns.

Table 5.8.1 indicates that unrealized capital gain coefficient is insignificant in bull and bear market. Therefore, it describe the fact that disposition effect do not successfully derive momentum in stock market even when market have upward trend as well as when market have downward trend. The momentum effect is significantly present but disposition effect do not able to explain this momentum in PSE under bull and bear market trends. Therefore, this fact implies that momentum in PSE not only drive by disposition effect but there are also other determining factors. Our study results are incline with the study of Birru (2015) that reports the presence of disposition effect in US but argue that this disposition effect is not have enough magnitude to drive momentum effect.

Table 5.9: Results for determinant of unrealized capital gain under bull and bear market

Panel A: $cg_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 Avt1_{-4:-1} + b_5 Avt2_{-52:-5} + b_6 Avt3_{-156:-53} + b_7 Size_{t-1} + e_t$

Period	b_1	b_2	b_3	b_4	b_5	b_6	b_7	Avg.R^2_{adj}
All	-1.1744	1.0821***	1.7316***	0.0202***	0.0219***	0.0277***	-0.2358	0.2336
	(-0.36)	(3.60)	(4.86)	(2.37)	(2.72)	(3.03)	(-0.68)	

Panel B: $cg_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 Avt1_{-4:-1} + b_5 Avt2_{-52:-5} + b_6 Avt3_{-156:-53} + b_7 Size_{t-1} + e_t$

Period	b_1	b_2	b_3	b_4	b_5	b_6	b_7	Avg.R^2_{adj}
All	15.866***	0.8500	2.3211***	0.0163	0.0246***	0.0407***	-0.0903	0.2847
	(3.37)	(1.51)	(3.82)	(1.51)	(2.47)	(3.15)	(-0.10)	

Note: The table show results of bear's market trend in panel A and bull's market trend in panel B. The market trends are established on the basis of stock returns. Positive returns represent bull's market trend and negative returns represents bear's market trend. The table shows value of coefficients, t-statistics in bracket and average adjusted R^2 of variables for cross-section Fama-Mecbeth (1973) regressions with the data of PSE from period January 2000 to December 2016. (*) show coefficients are significant at 10% level. (**) show coefficients are significant at 5% level. (***) show coefficients are significant at 1% level.

Table 5.9 reports the result for model in which capital gain variable regress over past cumulative returns, past average weekly turnover and size at the end of t time period.

Capital gain show significantly positive relationship with past cumulative returns except past short term cumulative return in bear market and intermediate past cumulative return in bull market, which infers as there is increase in past cumulative return there is increase in capital gain. In addition, capital gain have significantly positive relationship with average weekly turnover except intermediate average weekly turnover in bull market as the capital gain increase it implies increase in trading volume in bull as well as bear market. Beside, capital gain have significantly negative relationship with firm size. The following relationship attributed to the fact that usually smaller firms achieve more growth from larger firms and smaller firms realize high past returns in different time period as well as earns higher capital gain as compare to larger firms.

5.4. Robustness Check

In order to check our results robustness, we divided study sample data into two sample data set first sample data consist of year 2000 to 2016. For second sample data we excluded global financial crisis period from whole data set to avoid any falsification. The eliminated period consist of year 2008 and 2009. We follow the same method for checking robustness of our results as in the study of Kong *et al.* (2015) and Sakr *et al.* (2015).

Term financial refer to a condition or variety of conditions in which financial asset and institution lose large portion of their investment value. At the time of financial global crisis economy of Pakistan already face challenging situation because of fiscal and current account deficit, hasty inflation, small reserves, unstable currency, decline economy and week political situation. Therefore, it is suppose that Pakistan can bear the effect of financial crisis in short term but it also put strong impact in long term like decline in foreign

investment and existing foreign investment face lack of funds, size of remittance and exporters face strive (Ali, 2009).

Catastrophic financial global crisis take place in United States and extent all over the world. It cause great destruction to financial as well as real sectors of developed and developing economies. This crisis declared as the first largest crisis after great depression in 1930. In Pakistan, global financial crisis put positive significant effect on stock return volatility and negative significant impact on stock returns (Ali and Afzal, 2012). As the period of global financial crisis exclude from study sample data the robust results are similar with study overall results.

Table 5.10: Results for the impact of past cumulative returns on weekly returns

$$r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + e_t$$

Period	b_1	b_2	b_3	Avg.R^2_{adj}
All	-0.1086***	-0.0311***	-0.0177***	0.1060
	(-16.73)	(-10.97)	(-13.32)	
Jan	-0.1654***	-0.1902***	-0.0682***	0.5163
	(-3.59)	(-13.95)	(-8.29)	
Feb-Nov	-0.1342***	-0.0059***	-0.0088***	0.1286
	(-16.78)	(-2.79)	(-8.46)	
Dec	-0.2396***	-0.0044	-0.0064	0.6074
	(-5.00)	(-0.53)	(-1.32)	

Note: The table shows value of coefficients, t-statistics in bracket and average adjusted R^2 of variables for cross-section Fama-Mecbeth (1973) regressions with the data of PSE from period January 2000 to December 2016. (*) shows coefficients are significant at 10% level. (**) shows coefficients are significant at 5% level. (***) shows coefficients are significant at 1% level.

Table 5.10 shows the results for model in which only past cumulative variables are added as explanatory variables after the exclusion of the financial global crisis period from data set. The robust results of table 5.10 exhibits that there is no change in the results whether we exclude the period of financial crisis or not. Past cumulative returns for three

horizons are statistically significant over the sample period except in December. Coefficient of intermediate term momentum remain negatively significant during all month sample, January only, February to November sample period. This aspect indicates that there is seasonality in momentum continue to persist in the PSE even after the exclusion of financial crisis period. As well as. the significance of variables show that there is persistence of return predictability in PSE. Therefore, investors have potential to forecast future returns pattern with the help of past pattern of returns. In addition, Past winners continues to outperform whereas past losers continue to underperform.

Panel A and Panel B in Table 5.11 show results of model in which past cumulative returns, average weekly turnover and firm size added in the model. Moreover, weekly turnover and size added as control variable. Results exhibit that as the unrealized capital gain variable is omitted from the model there is no evidence for momentum reversal in the PSE. Results indicate that there is no significant changes occur in robust result as compare to the previous whole sample dataset. Except weekly returns have insignificant relationship in December. There is negative relationship between weekly return and average weekly turnover. Negative sign with coefficient of average weekly turn over show volume effect which do not eliminate in the period of financial global crisis and still persist in PSE. Results show negative significant relationship among weekly return and size except in December. The following relationship between weekly return and size is evident for the static persistence of size effect in PSE. The coefficient of turnover in Panel A shows positive relationship with weekly returns this may be due to January as well as December effect. In these months stocks prices have upward price trend and give more returns in these two months as compare to other months.

Table 5.11: Results for the impact of past cumulative returns, volume and size on weekly returns

Panel A: $r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 Avt_{t-1} + e_t$

Period	b_1	b_2	b_3	b_4	$Avg.R^2_{adj}$
All	-0.0954***	-0.0384***	-0.0258***	-0.0001	0.1277
	(-6.49)	(-12.25)	(-13.63)	(-0.97)	
Jan	-0.2352***	-0.2259***	-0.0936***	0.0005	0.6154
	(-8.57)	(-14.41)	(-8.51)	(1.07)	
Feb-Nov	-0.1343***	-0.0096***	-0.0138***	-0.0002	0.1539
	(-15.68)	(-3.97)	(-8.59)	(-1.13)	
Dec	-0.2110***	-0.0056	-0.0059	0.00007	0.6630
	(-3.59)	(-0.48)	(-1.09)	(0.28)	

Panel B: $r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 Avt_{t-1} + b_5 Size_{t-1} + e_t$

Period	b_1	b_2	b_3	b_4	b_5	$Avg.R^2_{adj}$
All	-0.1009***	-0.0311***	-0.0214***	-0.0001	-0.0103***	0.1424
	(-14.94)	(-10.79)	(-12.30)	(-0.91)	(-8.06)	
Jan	-0.1847***	-0.1874***	-0.0675***	-0.0041	-0.0469***	0.6783
	(-4.72)	(-8.26)	(-2.55)	(-0.87)	(-2.45)	
Feb-Nov	-0.1343***	-0.0059***	-0.0114***	-0.0000	-0.0050***	0.1709
	(-15.14)	(-2.40)	(-6.88)	(-1.34)	(-4.60)	
Dec	0.0115	-0.0441	0.0028	-0.0002	-0.0148**	0.7084
	(0.05)	(-1.16)	(0.44)	(-0.63)	(-2.01)	

Note: The table shows value of coefficients, t-statistics in bracket and average adjusted R^2 of variables for cross-section Fama-Mecbeth (1973) regressions with the data of PSE from period January 2000 to December 2016. (*) shows coefficients are significant at 10% level. (**) shows coefficients are significant at 5% level. (***) shows coefficients are significant at 1% level.

Table 5.12: Results for the impact of past cumulative returns, volume, firm size and unrealized capital gain on weekly returns

Panel A: $r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 Avt_{t-1} + b_5 size_{t-1} + b_6 cg_{t-1} + e_t$

Period	b_1	b_2	b_3	b_4	b_5	b_6	Avg.R^2_{adj}
All	-0.1083***	-0.0320***	-0.0210***	-0.0001	-0.0100***	-0.0000	0.1555
	(-15.38)	(-11.14)	(-12.07)	(-1.07)	(-7.88)	(-0.78)	
Jan	-0.1468***	-0.1757***	-0.0595***	-0.0039	-0.0306**	-0.0039	0.7379
	(-2.46)	(-9.95)	(-3.03)	(-1.16)	(-2.30)	(-0.22)	
Feb-Nov	-0.138***	-0.0059***	-0.0114***	-0.0000***	-0.0052***	-0.0000	0.1834
	(-15.62)	(-2.44)	(-6.82)	(-3.24)	(-4.70)	(-1.37)	
Dec	-0.2822**	-0.1079	-0.1418	-0.0032	0.0694	0.0000	0.7575
	(-2.13)	(-1.01)	(-0.96)	(-1.04)	(0.86)	(0.01)	

Panel B: $r_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 cg_{t-1} + e_t$

Period	b_1	b_2	b_3	b_4	Avg.R^2_{adj}
All	-0.1133***	-0.0319***	-0.0176***	0.0000	0.1181
	(-17.21)	(-11.75)	(-13.27)	(1.42)	
Jan	-0.1617***	-0.1765***	-0.0634***	0.0064*	0.5909
	(-2.86)	(-12.49)	(-7.73)	(1.80)	
Feb-Nov	-0.1366***	-0.0063***	-0.0089***	-0.0000	0.1397
	(-16.88)	(-3.17)	(-8.54)	(-0.53)	
Dec	-0.2426***	-0.0024	-0.0037	-0.0000	0.6644
	(-4.92)	(-0.22)	(-0.51)	(-0.01)	

Note: The table shows value of coefficients, t-statistics in bracket and average adjusted R^2 of variables for cross-section Fama-Mecbeth (1973) regressions with the data of PSE from period January 2000 to December 2016. (*) shows coefficients are significant at 10% level. (**) shows coefficients are significant at 5% level. (***) shows coefficients are significant at 1% level.

Panel A and Panel B in Table 5.12 shows the result for model in which capital gain variable is included as independent variable. Results represents that as the effect of capital gain variable is controlled, the coefficient of intermediate term momentum are negatively

significant except in December that is evident of intermediate momentum effect persistence in PSE. This provides indication that after exclusion of financial crisis period from data set there is no significant evidence that intermediate momentum effect eliminated as capital gain variable used as a controlled variable. Moreover, the relationship between weekly returns and capital gain still remain insignificant through all data samples. It implies that disposition effect in PSE do not derive momentum effect. Furthermore, disposition effect do not have the ability to explain momentum that persist in PSE alone. There must be the other factors with the disposition effect which are responsible for momentum strategies in stock market. It moreover, implies that expected returns do not have positive relationship with capital gain.

Table 5.13: Results for the determinant of unrealized capital gain

$$cg_t = b_0 + b_1 Ret1_{-4:-1} + b_2 Ret2_{-52:-5} + b_3 Ret3_{-156:-53} + b_4 Avt1_{-4:-1} + b_5 Avt2_{-52:-5} + b_6 Avt3_{-156:-53} + b_7 Size_{t-1} + e_t$$

Period	b_1	b_2	b_3	b_4	b_5	b_6	b_7	Avg.R^2_{adj}
All	9.5933***	0.5648	1.8644***	1.8644***	0.0121***	0.0183***	-0.7748	0.1929
	(2.77)	(1.51)	(4.91)	(2.68)	(4.04)	(5.01)	(-1.40)	

Note: The table shows value of coefficients, t-statistics in bracket and average adjusted R^2 of variables for cross-section Fama-Mecbeth (1973) regressions with the data of PSE from period January 2000 to December 2016. (*) shows coefficients are significant at 10% level. (**) shows coefficients are significant at 5% level. (***) shows coefficients are significant at 1% level.

The table 5.13 shows the result of model in which capital gain included as dependent variable and past cumulative return, average weekly turnover and firm size added as independent variables. The purpose to run this model is to understand the association between capital gain and other variables. The results are similar as in table 4 that unrealized capital gain is positively significant with weekly turnover for three horizons and past cumulative returns (short term and long term). Similarly, capital gain is insignificant with intermediate cumulative return and size. It implies that as the firm size decrease (increase) capital gain start increase (decrease). This relationship attributed to the

84

fact that smaller firms achieve more growth from larger firms and smaller firms realize high past returns in different time period as well as earns higher capital gain as compare to larger firms. The result do not change anymore to show the significant impact of intermediate horizon momentum and firm size.

Chapter 6

Conclusion

6.1. Background

There is wide work in literature that tries to discover the relationship among disposition effect and momentum in develop countries. However, when we review literature in developing countries specifically in case of Pakistan researchers emphasis on the existence of disposition effect and momentum separately. Though, they have pay no attention towards relationship between them. Therefore, there is still need to collect more empirical literature from emerging as well as developing economies that provides substantial evidence that how these anomalies persist and how its persistence effect financial markets efficiency. Thus, study main aim is to explore the relation among disposition and momentum effect in PSE. Furthermore, to find whether the disposition effect have an adequate amount of supremacy to drive momentum in PSE. Moreover, this study are also interested to observe the applicability of the model of Grinblatt and Han (2005) in case of PSE.

The study sample data consists of unbalance panel weekly data set of all the firms listed in PSE from period January 2000 to December 2016. In order to estimate study results we use Fama Macbeth (1973) regression analysis technique that provide a useful cross-sectional regression analysis. After estimation of the results we test its robustness by excluding the period of financial global crisis from our data set. Furthermore, to provide detail relationship among disposition effect and momentum we also estimate our models under up and down market trends. For the reason that, these market trends have the ability

to transform investor's behavioral tendencies and alter investors financial decisions pattern.

6.2. Key Findings

In this study, we are concerned to observe the correspondence between disposition effect and momentum for this purpose we test four major hypothesis. The study major findings are summarized as follow. First, we find the positive relationship between past historical returns over three time periods and unrealized capital gain this relationship support our first hypothesis. Furthermore, the presence of momentum in PSE also support the study third hypothesis. The results are consistence with the study of Grinblatt and Han (2005), Sakr et al. (2015) and Kong et al. (2015). Second, we observe that after the exclusion of unrealized capital from regression model there is no evidence for momentum reversal instead we find the persistence of momentum. It infers the fact that, investors in Pakistan are able to take significant benefits from momentum strategies. As, momentum participating is a strategy to take benefit from a trend established in a market as well as investors get more profit by take long position[21] when asset prices show upward trend and take short position[22] when asset prices show downward trend. The existence of momentum in PSE is incline with the study of Rehman and Mohsin (2012), Shah and Shah (2015) and Tauseef and Nishat (2015).

After adding size and average weekly turn over as explanatory variables we find the existence of volume as well as size effect in PSE. There is negative correlation among

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[21] Long position in momentum strategies implies that investors buy a stocks with hope that in future its price increases and they take benefit by sell these stocks.

[22] Short position implies that investors perceive that in future prices of specific stock decreases so they start short selling these stocks and sell the stocks which they did not possess at all.

weekly returns and average weekly turnover. The following relationship implies that low trading volume stocks beat the stocks with high trading volume. This fact is incline with the study of Pathirawasam (2011) and Sakr *et al.* (2015). Moreover, we finds negative relationship between weekly returns and firm size. Therefore, the low market capitalization firms outperform the firms with high market capitalization. The following finding is consistent with the study of Banz (1981), Herrera and Lockwood (1994), Hou and Moskowitz (2005), Haq and Rashid (2014) and Sakr *et al.* (2015). Moreover, we find the presence of seasonality in PSE in which specific day, week and month dominate over the other periods. This finding is consistent with the study of Zafar *et al.* (2012), Haroon and Shah (2013), Hashmi (2014), and Shamshir and Mustafa (2014).

Third, we find that after the inclusion of unrealized capital gain in our regression model, the effect of intermediate momentum do not disappear instead it persist significantly in PSE. After examining this fact it is not offensive to say that, persistence of momentum in PSE is not successfully explained by disposition effect as well as disposition effect do not derive momentum in PSE. Therefore, there are other key factors that are responsible to drive momentum in PSE this fact is against study fourth hypothesis and consistent with the study of Birru (2012). In Pakistan disposition effect do not have adequate power to lead momentum.

The study results are robust, there is no significant change occurs in robust results and study overall results. The reason for the similar result may be define as that, it is predicted instantly after the financial global crisis that these crisis must place substantial impact on develop as well as developing economies. In actual, financial global crisis left extensive effects on the economies of develop countries but in case of Pakistan these crisis

do not put considerable impact as well as the effect of these crisis are not very strong as compare to other economies because other countries market are more open than Pakistan market (Ali and Afzal, 2012). Furthermore, the study estimated results for bull and bear market trends that are also consist with study overall results. The presence of disposition effect is stronger in up market as compare to down market trends as we see the higher trading stock volume under bull market trend and low trading volume under bear market trend. Consequently, this fact support the presence of disposition effect in PSE. However, investors increase selling pressure in bull market because they want to realize profit as early as possible as well as investors decrease selling pressure in bear market because they prefer to wait for future when price start increasing. Therefore, we can say that momentum exist in PSE but the disposition effect have low magnitude to drive momentum effectively. It is not inappropriate to say that, the relationship among disposition effect and momentum in Pakistan cannot exactly the same as enlightened in the study of Grinblatt and Han (2005).

There are following reasons to justify the diversity in our results from the results of Grinblatt and Han (2005). First, they examine disposition effect and momentum association in US which is develop country and overall enjoys a stable economic as well as financial growth. On the other side, we examine the following relationship in case of Pakistan which is emerging economy and have low unstable economic, financial as well as political growth. Second, the regulatory board, policies development, polices implications and structure of financial activities in the USA are different from Pakistan. Third, there is difference between the behavioral tendencies of the investors of the USA and Pakistan. Because the tradition, moral norm, behavioral tendency, culture, emotion and psychological thinking of the investors of Pakistan are different as compare to the USA.

89

These factors as a whole have potential to modify the trading behavior or decision of investors across the diverse countries.

The existence of disposition effect in PSE support the concept of prospect theory, mental accounting, mean reversion and avoid regret. In Pakistan, investors show risk aversion behavior in case of winners and risk lover behavior in case of losers. This behavior of investors is evident in case of bull and bear market. Therefore, in case of bear market the stocks trading volume is low and in case of bull market stocks trading volume is high. Investors compare the value of stock with purchasing price and do not want to realize loss instead, they prefer to wait until the stock market value is greater than stock purchasing value. Because, investors want to avoid the feeling of regret which are associated with the selling of losers stocks. However, investors get feeling of pride by trading winners stocks. Conversely, investors believe that on average price revert back to their mean value so they feel eager to sell winners stocks and reluctant to sell losers stocks.

6.3. Policy Implications

From the policy implication point of view, results of our study helps professional investors to modify their trading behavior as well as also helps regulatory bodies and firms to review their financial policies. The asymmetry in financial information leads towards worse selection of investment pattern. Because, investors' investment decision influence by accounting information, experience, age and financial knowledge (Lodhi, 2014). Therefore, by providing balance information to investors through financial knowledge and accounting information regulatory authority can eliminate the asymmetry in information and put step forward to achieve efficient markets.

The presence of momentum, size, volume and seasonality in PSE provide evidence that in Pakistan the mechanism for prices to converge back to their market value is deprived. It allow investors to execute their financial activities profitably. Therefore, regulatory authorities must develop stable mechanism through which asset mispricing get corrected instantly and the stock prices converge back to its equilibrium point. As well as, the information structure in Pakistan must be restructured so that market information incorporate in stock prices instantly and no investor have ability to beat the market by incorporating past price pattern, publically available information and insider information in their trading activities.

The existence of disposition effect creates illiquidity in stocks in PSE. However, due to financial market illiquidity investors face difficulty to liquidize their securities as well as face high transaction cost. Consequently, the policy maker must develop policies and mechanism through which financial market illiquidity can be reduced and investor feel free when they liquidize their financial instruments. The presence of anomalies in stock market also represents abnormal returns for investors therefore, the firms must disclose in their financial reporting about their stocks that are subjected to market anomalies in order to enable financial authorities to develop efficient policies. The smallest firms in Pakistan show greater potential of growth as compare to larger firm. Therefore, the Government must establish supportive polices for smaller firm so that they develop faster and their faster growth strengthen the economy of the country in long run.

6.4. Future Limitations and Further Research Areas

The study results explain that the disposition effect do not have supremacy to drive momentum in PSE. Therefore, this study provides strategic gateway to future researchers

91

to explore significant determinant other than disposition effect that are responsible to drive momentum in PSE. However, this study uses the methodology of Grinblatt and Han (2005) which show inconsistency in case of Pakistan future researcher may examine described relationship by changing the proposed methodology. Moreover, this study examine the disposition effect and momentum association by taking all the firms listed in PSE it is possible that the results may show versatility across diverse industry. Therefore, the future studies possibly able to extend our findings by incorporating the comparison approach across different industries[23] in Pakistan. As well as, comparison approach can also be usefully if applied in case of financial and manufacturing firms. This study only take into account the economy of Pakistan it is also possible to examine prescribed relationship in case of other countries as well. Furthermore, the future studies may also compare the correlation between disposition effect and momentum in develop and developing (emerging) countries.

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[23] Different industries include Lather, textile, cotton, pharmaceutical, fisheries, fertilizers, cement, chemical jute, insurance, steel and tobacco etc.

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