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How Behavioral Aspects Affect Market Efficiency-Evidence from KSE 100 Index

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Abstract

Study of behavioral finance has been the focus of many researchers. Various researches as well as empirical analyses have been conducted in different stock markets of the world in order to verify the seasonal anomalies and to observe behavioral patterns of investors by which they earn abnormal returns. This research attempted to find anomalous behavior in two different sets of data. The first data set includes period of thirteen years from 1997 to 2010 and the second set of data consists of 11 years excluding the years of market crash 2005 2008. Both data sets have been tested by different data analysis tools, which reveal that some of anomalous behavior e.g. Turn of the Month (ToM) effect exists in KSE in first data set whereas the second data set is free from such anomalies.

Index terms—

1 Introduction

ehavioral finance deals with psychological traits and factors on the part of people who operate as investors, analysts, portfolio managers who may earn abnormal returns from capital market through prediction of observed patterns. This shows the anomalous behavior existing in capital market.

Concept of efficient market was developed in 1950 and it was published for the first time in 1970. Efficient market hypothesis was tested by using capital asset pricing model. Results revealed that there are many systematic deviations from the theoretical base which was important for market to be called as efficient. This deviation helps investor to get abnormal returns by using simple trading strategies. These deviations were then named as anomalies.

According to Olsen (1998), the aim of studying behavioral finance is to make clear understanding regarding different financial decisions as well as decision processes and the impact of psychological factors of investors or analysts on the systematic decision process.

It is acknowledged that currently there is no unified theory of behavioral finance. However the emphasis has to identify anomalies in different portfolios that can be classified through different psychological behaviors in individual or groups or indicating examples when it is able to identify abnormal return by taking advantage of the prejudice of investors/ analysts or portfolio managers.

Capital market efficiency is referred to as how much the security prices reflect all above information under the following assumptions. i) Large number of profit maximizing participants analyzes and value securities ii) New information regarding securities comes to the market in random fashion iii) Profit maximizing investors adjust security prices rapidly to reflect the effect of new information. iv) The expected return implicit in the current price of the security should reflect its risk. Fama (1970) tried to conceptualize the market efficiency theory and organize the growing empirical evidence. He further divided market hypothesis into three sub categories. i) Weak form: Market in which current price reflects the historical sequence of prices. In nutshell knowing past price patterns will not help you to improve forecast of future price. ii) Semi Strong form: Annual reports News item and public announcement etc reflect current price of stock in a stock market. iii) Strong form: Current price fully reflects all information that is public and private. Apart from the above forms of market efficiency, there are

some other factors which may lead to inefficiency of capital markets due to some observed behavior of investors. They may predict the anomalous behavior & observed patterns of stock market and earn abnormal returns which are against the credibility & reliability of market efficiency. This anomalous behavior can be judged in capital markets by analyzing day of the week effect/ weekend effect, January effect, turn of the month effect, occurrence of unexpected events and intraday effect. It is crystal clear that presence of anomalies cause inefficiency of capital market. There are certain factors of these anomalies by which investors earn abnormal returns in a stock market.

January effect in calendar anomalies is due to smaller capitalization stocks in very first week of first month of the year. Turn of the month effect is also an apparent anomaly existing in various stock markets which causes inefficiency of capital market. This happens at the end of every month and start of next month due to cash withdrawals on account of payments effect advocates too the anomalous behaviors of capital markets leading to inefficiency. DoW anomaly occurs due to the misquoting of price etc.

2 Calendar Anomalies

Anomalies that are associated to a specific period of time in equity markets are called calendar anomalies. There are number of anomalies which remain the area of interest of behavioral finance researchers. In this paper we attempt to find three forms of anomalies and these are, day of the week (DoW) effect, turn of the month (ToM) effect and January effect for Karachi stock market 100 index.

3 a) Day of the week (DoW) Effect

To find out day of the week effect, we use the regression analysis equation in this paper. The day of the week effect is a calendar anomaly which affect the efficiency of capital market. Chandra (2006) examined the existence of day of the week effect in Asia pacific equity markets and observed the stock behavior for some days of the week consistently differs from each other. This effect has important implications for the markets and investors who actively trade in the market. Day of the week effect depicts the behavior of stock market that the returns vary in different day of the week. **??**amal & Nasir (2005) in their study referred many researchers' studies and figured out few reasons about the observed behavior regarding weekend effect. Errors in measurement along with the adverse information of price as well as the settlement of the stock market procedure with dividend patterns are some points mentioned in their research for the day of the week effect.

4 b) Turn of the Month (ToM) effect

For Turn of the month effect (TOM), last working day of previous month and first three working days of next month's are considered as turn of the month effect. Remaining days of month are considered as Rest of the month (ROM) as followed by zafar, shah and urooj 2009. Hensel and Ziemba (1996) elaborated turn of the month effect in their research paper. According to them substantial cash flows happen in capital markets at the end of every month as well as start of the new month which affect the efficiency of market due to withdrawal of salaries, payments of principle amount, pension and dividends as well as interest on debts. c) January effect January effect refers to increase in stock prices during the month of January. It is generally linked to an increase in buying which follows the drop in price typically happens in December when investors seeking to create tax losses to off-set capital gains from a selloffs. It is also termed as "year-end-effect".

5 II.

6 Objective Of The Study

The basic aim of this study is to 1. Find various anomalous behaviors in terms of day of the week effect, turn of the month effect and January effect in Karachi Stock Exchange 100 index.

7 Literature Review

Impact of various calendar anomalies has remained an integral part of many researchers' to study turn of the month effect, day of the week effect & January effect in stock markets. Presence of Turn of the Month in stock market of 18 countries in 1970 has been proved. **??**Agarwal & Tandon, 1994).

Kamal & Nasir(2005) conducted research to analyze the day of the week effect, end of the month effect for pre 9/11 and post 9/11 in Karachi Stock Exchange Index. They found that there exists calendar anomaly in pre 9/11 era as the data is non-stationary and it does not follow the random walk which shows the inefficiency of market.

Zafar, Shah & Urooj, (2009). Anomalies in KSE have been found during the period of 1991-2007. Study proved that Turn of the Month exists for some particular period i.e. **??**991, **??**993, **??**002, **??**005 and the whole period of 1991-2007 in Karachi Stock Exchange after studying the data for the period of November 1991-2007.Study revealed that due to the presence of anomalies capital investors have to behave in different manners which are against the principles of market efficiency. Selling of shares start at the end of month and therefore investors look for positive change in upcoming month. Anomalies will lead investors in a conscious position and the situation ask them to manage such behavior of market.

Day of the week effect also tells story of anomaly in a stock market (Zhang & Li, 2006) discuss return of Monday as well as of Tuesday as the lowest for the week and Friday as the highest in terms of return. Increase in window length for a stock market shows more stability in the day of week effect. Study reveals that variation found in empirical evidence from Istanbul Security Exchange in day of week effect from January 1988 to August 1994. Chinese stock market exhibits significant January effect on small firms return which shows positive return of the month of January. Strong effect exists in Chinese market till 1997 at the significant level 5%.

Different statistical methods, tools and assumptions show different statistical result for a particular set of data like Karachi stock exchange. Shahid, Akbar(2009) study shows that day of the week effect is no more existing phenomena for Karachi Stock Market. They divided data into three groups and none of the group shows any indication of the presence of day of the week effect. Furthermore the study concluded that weekend's days do not show any abnormal or significant returns to the investor and the data does not exhibit any monthly effect.

Number of studies on the day of the week effect by researchers conducted on different equity markets of South Asia. Chahdra (**??**006) conducted research to study day of the week effect in the correlation of Asia specific markets. According to the research , Australia, Japan, and Korea market, the day of the week effect was an absent phenomena. Furthermore research concluded that consistent day of the week effect in the return and correlation was not present in markets of Asia specific.

It has been noted that January effect affect small firms because of reason like tax loss selling. Phenomena for efficient market is that it should have random walk then a stationary walk, this name January has been used because average monthly returns for small firms remain consistently higher than any other month of the year.

Kamal and Nasir (2005) conducted research on KSE and validate that Monday returns are lower and high variance than any other day. Furthermore the study revealed that seasonality across day of the week effect and confirm presence of highest Friday return and low Monday return in pre 9/11 data set for Karachi Stock Exchange market.

8 IV. Methodology a) Data

The data set used in this paper contains daily stock market index data from 07/02/1997 to 31/12/2010 obtained from KSE 100 Index. Data regarding daily closing values of Karachi stock exchange (KSE 100 Index) has been obtained from yahoo finance for this analysis. The total number of observations in first period is 3281 and.2784 in second set of data.

9 b) Model

The natural logarithmic returns of the series for Karachi stock exchange are used in this analysis. Daly stock index return is calculated by using this model.

10 Returns Formula

Rt = 100* ln(Pt/ Pt- The augmented dickey fuller (ADF) unit root test is given as?y t = ? 1 + ? 2 + ? y t-1 + ?i ? m t =1 ?y t-1 + ? t ???.. (1)

To find the time series data with unit root test we apply following model Yt = pY t-1 + ? t - **??**————————————————-(1) ?yt = (p -1) yt-1 + ? t - **??**————————————————(2) Or ?yt = ? yt-1 + ? t - **??**————————————————(Since the computed ADF test-statistics (0.74410) is less than the critical values –"tau" at 1% Critical Value (2.5664), 5% Critical Value (1.9394) and 10% Critical Value (1.6157) respectively, we cannot reject Ho. We may conclude that our Index series has a unit root problem and the Index series is a nonstationary series.

The ADF test suggests that our data of daily index starting from July 1997 to December 2010 is nonstationary so we can say that market is weak form inefficient at above levels of significance.

V.

11 Data Analysis

12 Descriptive Statistic

Table : I Descriptive statistic for market return, turn of the month effect, January effect and day of the week effect Analysis:-The return means, of market return (MR), turn of the month (ToM), January Effect and Day of the week effect (DoW) for the period from 1997 to 2010 are 0.0611, 0.197256, 0.07621 and 0.1896 respectively. This shows that Turn of the month effect in KSE 100 index is significant at 95 % level of significance. Analysis :-The result shows that t value of coefficient is 2.45788 and p value of coefficient is 0.014027 hence anomaly for turn of the month exists. We may also conclude that market is inefficient and the investors can earn abnormal profits in the very first week of every month due to observed anomalous behavior of KSE 100 index. Analysis :-This analysis shows that coefficient of t-value is 0.528238829 and coefficient of p-value is 0.115498574 which are less than 2.0 so we may conclude that weekend effect does not exist and market is said to be efficient. Anomaly in the form of weekend effect is no more existing phenomena for equity market of Karachi. Investors in this equity market cannot get abnormal returns on trading in week days which means that information reflects prices of the stock.

13 Table c (i)

Analysis :-The analysis shows that coefficient of t-value is -0.226195885 and coefficient of p-value is 0.821065688 which are less than 2.0 so we may conclude that weekend effect does not exist and investors cannot get abnormal returns on trading in week days which means that information reflects prices of the stock. A statistical test has been applied on both data sets. Results revealed that turn of the month exists in Karachi Stock Exchange in first data set only, while January effect and day of the week effect are no more existing phenomena for Karachi stock exchange market in both sets of data. In order to get abnormal return from the equity market, investors try to sell stock at the end of every month due to hoping for receiving good news regarding new and positive changes at the start of next month. Existence of weekend effect in foreign stock markets is due to weekly payment of salaries whereas in Pakistan these are paid on monthly basis, therefore, this effect has also not been proved in KSE.

The presence of Turn of the Month (ToM) effect in KSE 100 index in first data set is a challenge to the theory of market efficiency which is not a good sign. Government should take preventive measures to control over these anomalies through better administration. Extraneous factors like different political & dictatorship regimes and their economic policies might have affected the data set which may also be analyzed in case of Pakistan's equity market in future. [1] [2]

Figure 1:

Market Return		*Turn of The month*		*January Effect*		*Day of the week effect*	
Mean	0.072036388	Mean	0.198275862	Mean	0.075071839	Mean	0.188936782
Standard Error	0.048291416	Standard Error	0.00755772	Standard Error	0.004995005	Standard Error	0.007420429
Median	0.157568319	Median	0	Median	0	Median	0
Mode	0	Mode	0	Mode	0	Mode	0
Standard Deviation	2.54803013	Standard Deviation	0.398772697	Standard Deviation	0.263554564	Standard Deviation	0.391528718
Sample Variance	6.492457543	Sample Variance	0.159019664	Sample Variance	0.069461008	Sample Variance	0.153294737
Kurtosis	560.2623635	Kurtosis	0.29347129	Kurtosis	8.41900635	Kurtosis	0.528828864
Skewness	-13.64986444	Skewness	1.51435167	Skewness	3.226911639	Skewness	1.590109894
Range	131.7527093	Range	1	Range	1	Range	1
Minimum	-88.780667	Minimum	0	Minimum	0	Minimum	0
Maximum	42.97204227	Maximum	1	Maximum	1	Maximum	1
Sum	200.5493046	Sum	552	Sum	209	Sum	526
Count	2784	Count	2784	Count	2784	Count	2784
Confidence Level(95.0%)	0.094690616	Confidence Level(95.0%)	0.014819304	Confidence Level(95.0%)	0.009794289	Confidence Level(95.0%)	0.014550101

Figure 2:

SUMMARY OUTPUT FOR THE TURN OF THE MONTH EFFECT				
Regression Statistics				
Multiple R	0.042890158			
R Square	0.001839566			
Adjusted R Square	0.001535063			
Standard Error	1.745461459			
F	6.041209367			
Significance F	0.014027104			
Observations	3280			
	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.024009913	0.034016125	0.705839171	0.480338318
D2	0.188248515	0.076589567	2.457887175	0.014027104

Figure 3: Conclusion

SUMMARY OUTPUT FOR TURN OF THE MONTH EFFECT EXCLUDING 2005 & 2008				
Regression Statistics				
Multiple R	0.013953265			
R Square	0.000194694			
Adjusted R Square	-0.00016469			
Standard Error	2.548239939			
F	0.541743104			
Significance F	0.461773277			
Observations	2784			
	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.054358725	0.053937799	1.007803918	0.31363625
D2	0.089156907	0.121131836	0.736031999	0.461773277

Figure 4:

SUMMARY OUTPUT FOR TURN OF THE MONTH EFFECT EXCLUDING 2005 & 2008				
Regression Statistics				
Multiple R	0.013953265			
R Square	0.000194694			
Adjusted R Square	-0.00016469			
Standard Error	2.548239939			
F	0.541743104			
Significance F	0.461773277			
Observations	2784			
	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.054358725	0.053937799	1.007803918	0.31363625
D2	0.089156907	0.121131836	0.736031999	0.461773277

Figure 5:

SUMMARY OUTPUT FOR JANUARY EFFECT				
Regression Statistics				
Multiple R	0.029516956			
R Square	0.000871251			
Adjusted R Square	0.00051211			
Standard Error	2.54737761			
F	2.425932968			
Significance F	0.119455915			
Observations	2784			
	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.093459504	0.050200115	1.861738848	0.06274528
D2	-0.285368204	0.183217175	-1.557540679	0.119455915

Figure 6:

a

Figure 7: Table a (

a

c) Weekend Effect
Table b (ii) Excluding 2005 & 2008

Figure 8: Table a (

c

Figure 9: Table c (

[1]June © 2012 Global Journals Inc. (US)anomalous behavior in the form of Turn of the month
[2]June © 2012 Global Journals Inc. (US)

Analysis :-t-value coefficient for this set of data is 0.73603 and P-value coefficient is 0.46177 which is less than 2 and for that reason we may conclude that turn of the month for the second set of data which exclude the crash period year of 2005 and 2008 of Karachi stock market, turn of the month in this period of time does not exist.

.1 b) January Effect

Analysis :-The result of January effect shows that coefficient t-value of is 1.503187078 and coefficient of p-value is 0.132887138 which are less than 2.0 hence we may conclude that January effect does not exist in Karachi stock exchange. It means that the abnormal returns in January are no more existing phenomena for Karachi stock market 100 indexes and market is efficient in this regard. Dummy values (1) have been assigned to the month of January of every year.

.2 Table b (i)

Analysis :-The result for January effect shows coefficient of t value -1.5575 and coefficient of p-value 0.1194 are less than 2.0 which clearly reveal that this anomalous behavior does not exist in this data and investor cannot get abnormal return from this January effect.

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