

PERFORMANCE AND TIMING ABILITIES OF MUTUAL FUNDS DURING BULL AND BEAR MARKET: EVIDENCE FROM PAKISTAN

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Abstract

The mutual fund managers cannot remain indifferent to the stock market fluctuations and their correlation determines the return which investors are looking for. This article is making an attempt to investigate the variation of performance and timing abilities of 84 Pakistani mutual funds for the period 2007 to 2014 during bull and bear market. The results reveal that funds perform significantly well during market downturns. The funds exhibit selectivity timing ability during bull period while market timing and volatility timing abilities are evident in bear market. However, we do not find any evidence for style timing abilities among the fund managers. The implications come up from the results are that the funds perform well in bear market. The managers have the capability to adjust their investment portfolio according to the market movements by utilizing superior information.

Keywords: Mutual Fund Performance, Market Timing, Volatility Timing, Style Timing, Market Fluctuations.

JEL Classification: E120

Introduction

Stock market does not perform constantly all over the time; it shows variance in its behaviour. The sustained periods of price increase and price fall are classified as bull and bear markets respectively (Chauvet & Potter, 2000). A bull market is a flourishing market. The share prices start increasing and the overall economy inclines towards strength. Investors love taking high risks in order to make their pockets heavy with the big bucks. At this point there is high level of output, trade, employment and income, therefore the economy enjoys a better standard of living. On the contrary, all the above benefits fade away with the introduction of the bear market. This stage is characterized by the slowing down of all economic activities.

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The behaviour of the fund manager cannot be segregated from the stock market and true correlation between these two is an important factor for getting high return on the investment of the stakeholder. Mutual funds with different characteristics respond in their unique way to the stock market fluctuations, which in turn reflects their inherent stability. How mutual fund reacts under various market situations has been targeted by many researchers and found significant by them (e.g Wang, 2010; Glode, 2011; Kosowski, 2011; Spanje 2012; Nofsinger & Varma, 2014). Further, the investment performance of portfolio managers is contingent on market timing, volatility timing and security selection ability (Ferson & Mo, 2013).

Munoz et al. (2014) defines successful stock-picking ability as selection of stocks beating other stocks, exposed to the same class of non-diversifiable risk levels. However, the dynamic allocation of capital among various classes of investments based on market movements is referred to as Market timing . Market timing ability is an attempt to adjust or rebalance the risky equity holdings of the fund to adjust the funds' market beta in anticipation of the various market conditions.

Volatility timing ability is the choice of a strategy by a fund manager to set the portfolio's beta contingent upon conditional market volatility factor (Giambona & Golec, 2008). Mutual funds might enhance the value of their investors by increasing or decreasing their exposures to certain investment styles (Swinkles & Tjong-A-Tjao, 2006).

There is a plethora of empirical evidence on mutual fund performance for different market states but they mostly focus on developed markets (Nofsinger & Varma, 2014; Spanje, 2012). As this area remains almost silent for emerging markets, the core contribution of this study is to fill the gap by investigating the impact of varying market conditions on mutual fund performance. The study attempts to find out that whether the Pakistani mutual fund market is efficient and that all fund managers are able to diversify the risk elements in the industry for the investor under different circumstances of economy.

This study focuses on Pakistan as the industry experiences a mushroom growth in the recent past. In 1962, the first Mutual fund was launched in Pakistan. Now, a total of 181 open-ended mutual funds and closed ended mutual funds were operating in Pakistan by November, 2015. The mutual fund industry has shown tremendous growth with net assets grown to Rs.291billion by November 2015 (www.Mufap.com.pk).

Another question this study addresses is the breakdown of fund performance into various timing abilities and, to be more specific, in what way these managerial abilities behave under varying market conditions. This study investigates not only selectivity timing and market timing but will also estimate the volatility and style-timing abilities under the bull and bear market, which remains unanswered for Pakistani fund markets. In this manner, the present study is contributing to the growing mutual fund timing literature on several fronts by conducting a comprehensive analysis of

performance, timing abilities of 84 mutual funds in bull and bear market states from January 2007 to December 2014.

After introduction, the remainder of the study is organized as follows. Section 2 describes the previous literature related to the market timing and volatility timing in bull and bear market. Section 3 presents the data, the variables followed by the methodology and the models. Section 4 presents and discusses the empirical results and Section 5 summarizes the main findings and presents some concluding remarks.

Literature Review

There is abundant empirical literature available investigating the impact of high and low market states on performance of mutual funds. In this section the literature on the area regarding developed and developing markets is presented.

Literature Review on Selectivity Timing and Market Timing in Bull Bear Market Conditions Francis and Fabozzi (1979) argue that fund managers of the mutual funds do not reduce (increase) the fund's beta during bear (bull) market to take risk adjustment advantage for the shareholders. Chang and Lewellen (1984) using the monthly data of 67 US mutual funds for the period 1971 - 1979 study the performance of mutual funds in high and low market situation. The results show that few fund managers possess timing skills and overall the fund managers fail to outclass a passive investment strategy. Analysing the period from 1980-2005, Glode (2011) uses 3260 actively managed US equity funds. They conclude that the fund managers perform more actively in bad states as investors are willing to pay for more returns.

The market timing abilities among mutual funds is extensively researched for developed markets. Fama (1972) for the first time distinguishes fund performance into stock selection (micro-forecasting) and timing ability (macro-forecasting). Though, the final evidence on the ability of managers to show superior stock selection timing and market timing remains debatable. The past studies come up with mixed results. The advocates of superior stock selection include Kacperczyk, et al. (2014), The studies with poor selection abilities include Ang and Lean (2013), Munoz et al. (2013) Goo et al. (2015). There are some studies that report lack of market timing ability (Treynor & Mazuy, 1966; Christensen, 2005; Cuthbertson et al., 2010; Bhuvaneshwari & Selvam, 2011; Elmessearya, 2014; Hassan 2013; Goo et al., 2015). While others confirm the presence of market timing skill (Bollen & Busse, 2001; Chunhachinda & Tangprasert, 2003; Ang & Lean, 2013).

These studies do not compare the market timing ability across different market states. Chen and Liang (2007) confirms significant return timing during bull period and volatile market states for 221 US hedge funds. Kosowski (2011) finds positive market timing ability in recession for the US domestic equity mutual funds in recessions and expansions for the period 1962 to 2005. They argue

that in recessions, managers reveal only part of news, leading to asymmetric information and variation of information signals. These variations in signals give the managers advantage over average investors. Kacperczyk et al. (2014) find that mutual funds exhibit selectivity skill in booms and market timing skills in recession among the US equity funds for 1985 to 2005. They argue that managers forecast firm-specific variables in booms and market fundamentals in recessions. Munoz et al. (2014) comparing the US and European green and socially responsible funds from 1994-2013, conclude that the US green fund managers exhibit superior managerial abilities for the crises period. Leite and Cortez (2015) finds variation in performance and timing abilities among French funds during different economic states. Ang and Lean (2013) finds positive market timing but poor stock selectivity skill for 188 SRI fund managers in Luxembourg for period 2001-2011. Munoz, et al. (2013) finds poor stock-picking ability and market timing ability for the US and European socially responsible mutual funds for the period 1994-2013. Goo et al., (2015) finds no evidence of stock selection and timing abilities for Taiwan industry from 2004 to 2009.

Literature Review on Volatility Timing

Busse (1999) first investigates the presence of volatility timing skill among the fund manager that predicts that time volatility counter-cyclically for 80 percent of his sample funds during 1985-1995. Johannes et al. (2002) document that volatility timing strategy performs better than market timing. Chunhachinda and Tangprasert (2003) find significant volatility timing abilities in Thailand mutual fund industry when daily data is used. Holmes and Faff (2004) formulate a cubic model and provide empirical support about existence of volatility timing skill among Australian multi-sector funds for the period 1990-1999. Marquering and Verbeek (2004) confirms significant volatility timing at monthly frequency for the period 1996 to 2001. Legacy and Bu (2010) find the existence of volatility timing ability in bear market funds from 2000-2008. Tschanz (2010) comparing US and UK equity mutual funds from 1998-2003 confirm volatility timing among the funds but it is more profound in US.

Cao (2011) finds little evidence of volatility timing in emerging market hedge funds for 541 funds from the 1980 and 2009. Bodson et al. (2013) document that on average 13% of mutual funds exhibit volatility timing. Chen and Liang (2007) finds significant volatility timing coefficient during volatility market states for US hedge funds. To my knowledge, there is no study covering volatility timing of mutual funds across different market states.

Literature Review on Style Timing

In addition to market timing and volatility timing, recent studies have shifted their attention towards new dimension of style-timing. Chen et al. (2002), Swinkles and Tjoe (2007) and Ferruz et al. (2012) are few among them who find negative or ambiguous results for style timing. Glode (2011) reports better performance of funds during bad states of economy as compared to good states of

economy for the US equity funds for the period 1980 to 2005. Munoz et al. (2014) report that European fund managers exhibit style timing ability towards size and book-to-market during non-crises period but lack style timing ability during crises. While opposite behaviour is reported for the US green funds. Leite and Cortez (2015) comparing French SRI funds and conventional funds from 2000 to 2012, report little evidence of market and style timing abilities and show that both exhibit better timing abilities during crises period. Munoz et al. (2015) find no difference in timing skills of conventional funds and socially responsible funds. Yi and Hi (2016) use false discovery rate (FDR) to determine the style timing ability of Chinese mutual funds. They report positive market timing but no style timing.

Data and Variables Construction

Sample and Data Sources

This study employs monthly data of 84 open-end mutual funds for the period 2007-2014. Following Javid and Ahmad (2008), this study accounted only those companies which remain listed all through the sample period. The main sources of the data are bulletins of State Bank of Pakistan, Mutual funds Association of Pakistan (MUFAP) official website, Karachi Stock Exchange, Securities and Exchange Commission of Pakistan (SECP), concerned individuals and Business Recorder.

Stock data is extracted from Data Stream. Following Griffin et al. (2010) This study eliminates “stocks that represent cross listings, duplicates, mutual funds, unit trusts, certificates, notes, rights, preferred stock, and other non-common equity.” As the timing abilities are supposed to be found only for actively managed funds (aim to generate higher returns than the market portfolio), this study consider only non-index funds in this study (Kader & Qing, 2007). The equity, income, Islamic equity, balanced and aggressive income funds in this study are included.

The mutual funds NAV (Net Asset Value) are picked from the MUFAP (Mutual Funds Association of Pakistan) website. The mutual fund returns, the following formula is used:

$$R_{P_i} = (NAV_t - NAV_{t-1}) / NAV_{t-1} \dots\dots\dots(1)$$

where NAV_t is the net asset value⁴ of mutual fund i at time t. For market returns the t-bills rate is taken from the KSE website. The daily t-bill rate is calculated as:

$$R_{ft} = (100 / (100 - P_{ft}))^{1/n} - 1 \dots\dots\dots(2)$$

⁴NAV is formulated by taking the closing market value of the fund's investments minus all liabilities divided by total number of shares (outstanding). It is calculated after the close of market each day.

Pt is the closing value of the Treasury-bill on day t, nt are the number of trading days in the coming year.

Performance Evaluation

The returns of mutual funds can be modelled using the CAPM with the following specifications:

$$R_{pt} - R_{ft} = \alpha_p + \beta_1(R_{mt} - R_{ft}) + \varepsilon_{it} \quad \dots\dots\dots(3)$$

where $R_{p,t}$ is the portfolio return at period t, $R_{f,t}$ captures the risk-free rate at period t, $R_{m,t}$ is the returns- on the take market/ benchmark at period t, α_p measures the portfolio returns with zero covariance with the return. The coefficient β_1 is systematic risk measuring the relative risk of the portfolio against the benchmark. A fund with $\beta > 1$ ($\beta < 1$) has higher (lower) risk than the benchmark. ε_{it} is the error term having zero mean assuming to be homoscedastic and serially independent.

The above CAPM model assumes that the beta coefficient remains constant over the investment horizon and does not vary in response to varying t market conditions, ‘bull’ and ‘bear’ markets. This assumption of constant beta limits the validity of the model. Several studies (Pettengill, et al., 1995; Faff, 2001; Lunde & Timmermann, 2004 & Hodoshima, et al., 2000)) confirm that beta varies subject to different market conditions. Fabbozi (1979) capture the differential aspect of intercept and systematic risk in bull and bear market conditions by introducing dummy variable in CAPM.

$$R_{pt} - R_{ft} = \alpha_p + \beta_1(R_{mt} - R_{ft}) + \beta_1 D_t(R_{mt} - R_{ft}) + \varepsilon_{it} \quad \dots\dots\dots(4)$$

where D_t is a binary (or dummy) variable, takes value of 1 for bull market and zero otherwise.

Fama and French (1993) introduced a three-factor model, and many researchers confirm that their model provides better results than unconditional CAPM model. Fama-French (FF) three-factor model introduces SMB⁵ (small minus big) and HML⁶ (book-to-market equity) factors to CAPM model along with the benchmark market returns.

To cater the new variables, Eq. (1) now takes the following form:

$$R_{pt} - R_{ft} = \alpha_p + \beta_1(R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \varepsilon_{it} \quad \dots\dots\dots(5)$$

SMB (Fama & French, 1993) and HML (Fama & French, 1993) represents the presence of size factor and book-to market factor respectively. A significant positive β_2 depicts that size effect

⁵ SMB= [1/3 (Small Low(SL)+ Small Medium +Small High)-1/3(Big Low+ Big Medium =Big High)]

⁶ HML = [1/2(Small High+ Big High) – ½ (Small Low+ Big Low)]

exists i.e. the small size portfolio generates more returns than the large size portfolio. A significant negative β_2 designates the absence of size effect. Conversely, an insignificant β_2 shows that both small and large size firms fail to contribute any substantial addition to the portfolio. A positive significant β_3 confirms that value effect exists. Value portfolio is estimated by the high book-to-market ratio portfolio. When value effect exists, this means that the portfolio returns is attributable more to the high book-to-market portfolio as compared to portfolio with low book-to-market value. Whereas, a negative significant β_3 indicates the presence of growth effect, i.e. the portfolio's return is accounted more by funds having low book-to-market value.

Carhart (1997) establishes that returns of the funds are strongly affected by momentum factor in stock-returns and hence, he extends the three-factor model by introducing momentum factor. Incorporating Carhart (1997) momentum factor, the CAPM takes the following form:

$$R_{P_t} - R_{f_t} = \alpha_p + \beta_1(R_{m_t} - R_{f_t}) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 MOM_t + \varepsilon_{it} \quad \dots\dots\dots(6)$$

Where MOM^7 (Carhart, 1997) measures the differential impact of past winners and past losers portfolio. A positive significant coefficient of β_4 , shows that winner portfolio is contributing more returns to the portfolio as compared to loser portfolio (momentum effect). It indicates that strategy of buying past winner portfolio and selling past loser portfolio will generate higher returns for the portfolio. Whereas, a negative significant β_4 confirms the presence of contrarian effect, i.e. the loser funds are performing better than the winner funds.

Nofsinger and Varma (2014) introduce the dummy variables to differentiate the performance and risk estimates under crises and non-crises periods. The model thus takes the following form. This analysis uses this model to check effect for bull and bear period by incorporating two dummy variables

$$R_{P_t} - R_{f_t} = \alpha_p + \beta_{1BU}(R_{m_t} - R_{f_t})D_{BU,t} + \beta_{1BE}(R_{m_t} - R_{f_t})D_{BE,t} + \beta_{2BU}SMB_t D_{BU,t} + \beta_{2BE}SMB_t D_{BE,t} + \beta_{3BU}HML_t D_{BU,t} + \beta_{3BE}HML_t D_{BE,t} + \beta_{4BU}MOM_t D_{BU,t} + \beta_{4BE}MOM_t D_{BE,t} + \varepsilon_{it} \quad \dots\dots\dots(7)$$

Where β_{BU} is a dummy variable, taking value of one when market is bull and zero otherwise. β_{2BU} , β_{3BU} and β_{4BU} represents SMB, HML and Momentum respectively during bull period. Whereas, β_{2BE} , β_{3BE} and β_{4BE} represents SMB, HML and Momentum respectively during bear period.

⁷ $MOM = [\frac{1}{2} (\text{Small Winner} + \text{Big Winner}) - \frac{1}{2} (\text{Small Looser} + \text{Big Looser})]$

Market and Volatility Timing Model

For analysis Treynor and Mazuy (1966) and Henriksson and Merton (1981) models are used to determine the market timing skills of the fund managers. By adding the square returns term to CAPM, Treynor and Mazuy (1966) have modified the basic CAPM model. Hence, the modified model of CAPM is shown in following equation (8):

$$R_{pt} - R_{ft} = \alpha_p + \beta_1 (R_{mt} - R_{ft}) + \eta_i (R_{mt} - R_{ft})^2 + \varepsilon_{it} \quad \dots\dots\dots(8)$$

Where $R_{p,t}$ is the portfolio return at period 't', $R_{f,t}$ captures the risk-free (benchmark) rate at period 't', $R_{m,t}$ measures the returns on the market at period 't'. η represents the market timing ability. Coefficient of the squared term can be negative, indicating that mutual funds are not good enough to predict the market. This model measures the relationship between portfolio's coefficient sensitivity to the market and actual market return. Manager having market timing ability will increase (decrease) market exposure ' η ' in response to the market up (down) states. Treynor and Mazuy (1966) argue a positive ' η ' designates that the portfolio's rates of returns are more receptive towards positive market returns than negative market returns. A significant positive η symbolized the presence of market timing ability. If a fund manager lacks market timing skill, he depends solely on the stock selectivity skill to achieve abnormal returns.

In order to investigate market timing abilities under bull and bear market, two dummy variables are incorporated in the regression model, resulting into the following form for the model:

$$R_{pt} - R_{ft} = \alpha_p + \beta_{1BU} (R_{mt} - R_{ft}) D_{BU,t} + \beta_{1BE} (R_{mt} - R_{ft}) D_{BE,t} + \beta_{2BU} SMB_t D_{BU,t} + \beta_{2BE} SMB_t D_{BE,t} + \beta_{3BU} HML_t D_{BU,t} + \beta_{3BE} HML_t D_{BE,t} + \beta_{4BU} MOM_t D_{BU,t} + \beta_{4BE} MOM_t D_{BE,t} + \eta_{iBU} (R_{mt} - R_{ft})^2 D_{BU,t} + \eta_{iBE} (R_{mt} - R_{ft})^2 D_{BE,t} + \varepsilon_{it} \quad \dots\dots\dots(9)$$

Where η_{iBU} and η_{iBE} represents market timing ability under bull and bear market respectively.

For volatility timing, the mutual funds are evaluated by applying the Busse (1999) one index model. Busse has started with CAPM single index model, given by:

$$R_{pt} - R_{ft} = \alpha_p + \beta_1 (R_{mt} - R_{ft}) + \varepsilon_{it} \quad \dots\dots\dots(10)$$

where R_p represents the simple excess return over risk free assets (t-bills) on portfolio p in period t, R_{mt} is the market return (KSE-100) in period t. Busse (1999) defined market beta as "a linear function of the difference between market volatility and its time-series mean":

$$\beta_{it} = B_i + \lambda_i (\sigma_{mt} - \bar{\sigma}_m) \quad \dots\dots\dots(11)$$

Substituting the value of beta from equation (11) into the original CAPM model, the CAPM yields the following form of the Busse Model

$$R_{pt} - R_{ft} = \alpha_p + \beta_i(R_{mt} - R_{ft}) + \lambda_i(\sigma_{mt} - \bar{\sigma}_m)(R_{mt} - R_{ft}) + \varepsilon_{it} \quad \dots\dots\dots(12)$$

where σ_{mt} is the market volatility during period t, $\bar{\sigma}_m$ is the average period volatility.

λ_i is the coefficient of the volatility term. The sign of the coefficient determines the existence of the volatility timing. The negative value of λ_i will confirm the existence of the volatility timing, indicating that during high volatility periods the portfolio returns should act in the contrasting direction of the market, however, during low volatility periods, the portfolio return should move along with direction of the market.

To investigate volatility timing ability under bull and bear market states, two dummies are introducing into the model as follows:

$$R_{pt} - R_{ft} = \alpha_p + \beta_{1BU}(R_{mt} - R_{ft})D_{BU,t} + \beta_{1BE}(R_{mt} - R_{ft})D_{BE,t} + \beta_{2BU}SMB_t D_{BU,t} + \beta_{2BE}SMB_t D_{BE,t} + \beta_{3BU}HML_t D_{BU,t} + \beta_{3BE}HML_t D_{BE,t} + \beta_{4BU}MOM_t D_{BU,t} + \beta_{4BE}MOM_t D_{BE,t} + \lambda_{iBU}(\sigma_{mt} - \bar{\sigma}_m)(R_{mt} - R_{ft})D_{BU,t} + \lambda_{iBE}(\sigma_{mt} - \bar{\sigma}_m)(R_{mt} - R_{ft})D_{BE,t} + \varepsilon_{it} \quad \dots\dots\dots(13)$$

Where λ_{iBU} and λ_{iBE} measures the volatility timing ability of fund managers under bull and bear market respectively.

Style Timing Model

To measure style timing abilities, this study adopts Lu (2005) indicating that the Treynor and Mazuy (1966) assumes that a manager receives a private signal (y_t), equivalent to future market returns and an independent noise term, give by:

$$y_t = R_{m,t+1} + \eta_t \quad \dots\dots\dots(14)$$

Also following Munoz (2015), incorporating the private signal into the Carhart (1997) model will lead to style timing abilities. The model thus takes the following form:

$$R_{pt} - R_{ft} = \alpha_p + \beta_1(R_{mt} - R_{ft}) + \beta_2SMB_t + \beta_3HML_t + \beta_4MOM_t + \gamma_2SMB_t^2 + \gamma_3HML_t^2 + \gamma_4MOM_t^2 + \varepsilon_{it} \quad \dots\dots\dots(15)$$

Where 1, 3 and 4 represents the timing abilities towards size, book-to-market and momentum respectively.

To investigate how style timing abilities varies across different market states, following Leite and Cortez (2015), the model becomes:

$$R_{pt} - R_{ft} = \alpha_p + \beta_{1BU}(R_{mt} - R_{ft})D_{BU,t} + \beta_{1BE}(R_{mt} - R_{ft})D_{BE,t} + \beta_{2BU}SMB_t D_{BU,t} + \beta_{2BE}SMB_t D_{BE,t} + \beta_{3BU}HML_t D_{BU,t} + \beta_{3BE}HML_t D_{BE,t} + \beta_{4BU}MOM_t D_{BU,t} + \beta_{4BE}MOM_t D_{BE,t} + \gamma_{1BU}SMB_t^2 D_{BU,t} + \gamma_{1BE}SMB_t^2 D_{BE,t} + \gamma_{2BU}HML_t^2 D_{BU,t} + \gamma_{2BE}HML_t^2 D_{BE,t} + \gamma_{3BU}MOM_t^2 D_{BU,t} + \gamma_{3BE}MOM_t^2 D_{BE,t} + \gamma_{4BE}(R_{mt} - R_{ft})^2 D_{BE,t} + \gamma_{4BU}(R_{mt} - R_{ft})^2 D_{BE,t} + \epsilon_{it} \quad (16)$$

Where 1BU, 2BU, 3BU and 4BU measure the sensitivities towards size, book-to-market, momentum and market during bull period and 1BE, 3Be and 4BE measure the manager's abilities during bear period. Finally, to obtain selectivity, timing and volatility timing coefficients under bull and bear market, equation 12 is incorporated into equation 16. The model thus results into the following form:

$$R_{pt} - R_{ft} = \alpha_p + \gamma_{1BU}(R_{mt} - R_{ft})^2 D_{BE,t} + \gamma_{1BE}(R_{mt} - R_{ft})^2 D_{BE,t} + \gamma_{2BU}(\sigma_{mt} - \bar{\sigma}_m)(R_{mt} - R_{ft})D_{BU,t} + \gamma_{2BE}(\sigma_{mt} - \bar{\sigma}_m)(R_{mt} - R_{ft})D_{BE,t} + \gamma_{3BU}SMB_t^2 D_{BU,t} + \gamma_{3BE}SMB_t^2 D_{BE,t} + \gamma_{4BU}HML_t^2 D_{BU,t} + \gamma_{4BE}HML_t^2 D_{BE,t} + \gamma_{5BU}MOM_t^2 D_{BU,t} + \gamma_{5BE}MOM_t^2 D_{BE,t} + \epsilon_{it} \quad (17)$$

Where all the variables remain the same as discussed above.

Empirical Results and Discussion

Descriptive Statistics

The following section covers the descriptive statistics of all the variables covered in this study over the time period 2007-14.

Table 1
Descriptive Statistics

Variables	Definitions	Mean			St.Dev			Skewness			Kurtosis		
		Whole	Bull	Bear	Whole	Bull	Bear	Whole	Bull	Bear	Whole	Bull	Bear
Rp	Return of Portfolio	0.007	0.010	0.003	0.059	0.053	0.015	-2.151	-1.716	32.170	29.132	31.260	1380.737
Rm	Market Return	0.024	0.031	-0.007	0.056	0.047	0.022	0.041	0.537	-3.27	3.928	5.275	12.499
SMB	Size Portfolio	0.040	0.044	-0.004	0.091	0.086	0.023	-0.068	-0.076	-0.067	1.956	2.243	14.702
HML	Book-to-market	-0.044	-0.038	-0.006	0.132	0.129	0.035	-0.1	-0.208	-4.914	2.364	2.521	30.800
MOM	Momentum Portfolio	0.117	0.065	0.051	0.455	0.405	0.222	-0.233	-0.254	2.626	2.408	2.805	11.386
Obs.		3108	3108	3108	3108	3108	3108	3108	3108	3108	3108	3108	3108

Table 1: Descriptive statistics of all the variables for the data from 2007 to 2014 are presented. The variable definitions are provided in column 2.

Table 1 summarises the descriptive statistics for mutual fund returns and benchmark returns over the sample period ranging from 2007 to 2014 for the whole sample as well as for the bull and bear periods. It shows that mean of funds excess returns, market returns, size factor and momentum factor are statistically significantly lower in bear periods than in bull periods. However, the mean of the book-to-market factor is lower in bull period. It also reports that all fund excess returns and benchmarks are more volatile in bull period than in bear periods. The results show that on average, the excess returns are negatively skewed but in bear periods the excess returns series are positively skewed while they are negatively skewed in bull periods. Whereas, the opposite behaviour is observed for the market returns.

Regression Results and Discussion

Before discussing the results of this study, it is appropriate to discuss the validity of the estimation technique. For panel data, fixed effect and random effect model are applied. The results for fixed effect model are reported in this study as Hausman test comes up in support of fixed effect model.

Table 2
Performance in Bull and Bear Market

Variables	Bull	Bear
α_p	- 0.004** (-3.181)	0.024*** (8.153)
β_1	0.608*** (38.864)	0.832*** (19.910)
β_2	-0.081*** (-9.753)	-0.089*** (-4.484)
β_3	0.0193** (3.436)	0.223** (10.369)
β_4	0.003 (1.331)	0.038*** (7.936)
R^2	31	

Note: This table reports the estimates of performance of Pakistani mutual funds across Bull and Bear market, built on multi-factor model of Eq (6). The coefficient α_p measures the performance. While β_1 , β_2 , β_3 and β_4 represent the market excess return, size factor, book-to-market factor, momentum factor respectively. The results in the parenthesis report the (t-values). The *** indicates significance at 1%, ** at 5% and * at 10% respectively.

Table 2 presents results of performance under bull and bear market for the entire sample period. When looking at performance (Jensen's alpha), the funds exhibit statistically significant negative alpha at 5% during bull period. The alpha in expansion periods concur with Ende (2014). It means that mutual funds are not adding any value in bull period. They conclude that volatility (high volatility leads to more information advantage) and net cash inflows are key factors affecting fund's performance. However, alpha is statistically positive at 1% during bear period. It suggests that the managers perform significantly well during bear period than in bull period. These results are in line with results reported by Kosowski (2011), Glode (2011), Spanje (2012), suggesting that funds perform better in Bear market than Bull market. The results suggest that fund managers are more active in bear market than bull period. One possible explanation can be that managers have access to information and they take advantage of asymmetric information and variation of information signals (Kosowski, 2011). These results are in contrary to Fink et al. (2015), who finds that mutual funds fail to outperform during recessions. But when Fink et al. (2015) uses a short sample period, they find that mutual funds outperform in recessions.

Then three-index and four-index models are estimated following Kader and Qing (2007). They find that taking size and value effect has led to higher explanatory power while analysing

managed portfolio performance in Hong Kong. Adding three-index and four-index factors have increased the explanatory power of the model. The funds have a higher loading towards market excess return, book-to-market factor and momentum in bear market. However, the coefficient β_2 , representing size has a negative and statistically significant coefficient, depicting that size portfolios has no impact on portfolio returns. Funds are more inclined towards large size companies both in bull and bear market. The results for size in bear market is in line with Glode (2011) while opposite for bull period and for other factors.

A positive significant β_3 confirms that funds are tilted towards the value portfolio estimated by the high book-to-market ratio. When value effect exists, this means that the portfolio returns are attributable more to the high book-to-market portfolio than the low book-to-market portfolio. These results are in line with Ende (2014)

As far as momentum factor is concerned, an interesting fact comes forward; the coefficient becomes statistically significant during bear period. The positive loading towards momentum is consistent with Kosowski (2011), Ende (2014).

Table 3 presents results of Equation 17:

Timing abilities under bull and bear market

Variables	Bull	Bear
α_p	0.008*** (7.250)	-0.007** (-2.234)
γ_1	-0.615*** (-4.336)	5.974*** (9.734)
γ_2	7.673*** (39.828)	-13.104*** (-37.463)
γ_3	-0.122** (-2.770)	-0.181** (-2.430)
γ_4	-0.022 (-0.985)	-0.078 (-0.594)
γ_5	-0.012** (-3.625)	-0.022** (-3.974)
R^2	0.52	

Note: This table reports the estimates of performance of Pakistani mutual funds across Bull and Bear market, built on multi-factor model of Eq (17). The coefficient α_p measures the performance (selectivity skill), while γ_1 , γ_2 , γ_3 and γ_4 and γ_5 represent the timing abilities towards market excess, volatility, size, book-to-market factor, momentum factor respectively. The results in the parenthesis report the (t) values. The *** indicates significance at 1%, ** at 5% and * at 10% respectively.

Table 3 presents the results of how timing abilities varies across market conditions.

The selectivity timing is statistically positive, significant at 1% under bull market and negative at 5% under bear market. It shows that managers' exhibit stock picking abilities in bull period while lack this ability during bear period. It confirms that fund managers lack the ability to alter their portfolios according to the extreme market conditions to give advantages to the shareholders. This is in line with Philippas (2013) who suggest that fund managers should be capable enough to take advantage of asset mispricing and recognize the most undervalued equities and to adjust their portfolio's risk level to bull and bear markets correspondingly. These findings are in line with Kacperczyk, et al. (2014). Here, our findings are opposite to Kosowski (2011). It is important to mention that we are considering a different sample size and time period.

In terms of market timing, the market factor is lower in bear period than in bull period. This confirms the presence of positive market timing. This result is in line with Kosowski (2011); Kacperczyk, et al. (2012). It is interesting to find that coefficients of selectivity skills and market timing behave in opposite directions. It is in line with Neto (2014) who finds that funds managers cannot hold both skills simultaneously. He argues that when a manager concentrates in picking under-priced stocks cannot follow the market movements and vice versa.

As far as volatility timing is concerned, the funds possess statistically significant volatility timing in bear market. The negative sign confirms the existence of volatility timing skill among the fund manager. It is consistent with the findings of Busse (1991), Chunhachinda (2003), Zhao (2011), Huang (2012) confirms little evidence of volatility.

Overall, the results indicate no sign of style timing abilities for Pakistani fund market. These results are in compatible with Yi and He (2016) who find no evidence of style timing abilities among Chinese mutual funds. As per our results, the funds exhibit negative style timing abilities towards size and momentum factors in bull and bear period. These results are in line with Leite and Cortez (2015) for bull period but opposite for bear market. The style timing ability to time book-to-market factor is silent both during bull and bear market. The fund managers fail to exhibit a correct book-to-market timing ability as they achieve a negative but an insignificant γ_{HML} . Although the coefficients are negative but it is not statistically significant. These results are in agreement with Ferruz et al. (2012) on conventional funds. However, the study does not segregate the bull and bear period.

The absence of size style-timing is in line with Chen et al. (2002), Swinkles and Tjoe (2007) but opposite to Munoz (2015). It is important to highlight that these studies do not attempt to segregate bull and bear market. While this study results are in line with Leite and Cortez (2015) for bull period. The absence of book-to-market style timing is consistent with Chen et al. However, these results are contrary to those previously reported by Munoz (2015), and Leitz and cortez (2015).

As far as momentum style-timing is concerned, these findings are in line with those reported by Lu (2005) and Munoz (2015). Though these studies do not take into account the effect of bull and bear market separately. It suggests that fund managers are selling winners too soon and keeping losers too long. The results are in agreement with results reported by Leitz and Cortez (2015) for conventional funds for crises period.

Conclusions

Recently many researchers in mutual fund industry have realized the significance of comparing the funds' performance in response to ups and downs of the market. In fact many studies show that fund managers outperform in bear market than bull market (Kosowski, 2011; Leite & Cortez, 2015). For an emerging economy like Pakistan, this issue is more pertinent to explore as Claessens, et al. (2015) report that recessions and financial disruptions in emerging markets are costlier and protracted than developed economies with greater losses in output.

In this regard, this paper aims to investigate the variation of performance and timing abilities of 84 Pakistani mutual funds for the period 2007 to 2014 during bull and bear market.

The results depict that funds perform significantly better in Bear market than Bull market, in agreement with prior studies on mutual funds (Glode, 2011; Kosowski, 2011; Leite & Cortez, 2015).

In the context of managerial abilities, funds exhibit selectivity timing ability during bull period. With regards to market timing and volatility timing funds perform better during bear market, while these skills are absent in bull period. As far as style timing abilities are concerned, the Pakistani fund managers exhibit significant negative timing skills. The higher values of coefficients are reported in bear market than bull period. The results for bear market are consistent with Leite and Cortez (2015) but are opposite for bull period.

The implications that emerge from these results are that the mutual funds perform effectively in bear market. The mutual funds are capable of adjusting their investment according to the market condition by utilizing superior information. Fund managers appear to distinguish that investors behave quite differently in bull and bear markets. They follow more diversified investment strategies after periods of low market returns than after periods of high market returns.

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