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CONDITIONAL MODELS IN PERFORMANCE EVALUATION OF MUTUAL FUNDS IN INDIA

Rakesh Kumar
Associate Professor (Economics) Department of Post Graduate Studies,
Punjabi University Regional centre, Bathinda,
rkdudhan@yahoo.co.in
09855568452

Abstract— **This study evaluates the performance of Indian mutual fund industry by using conditional models (based on the semi - strong form of market efficiency model of Fama). The study reveals that Indian fund managers have strong stock picking ability. However, they are not capable to time the market and even public information could not help in this context. Besides, there is a tradeoff between the selectivity and market timing ability, that is he is unable show his prowess in both the categories simultaneously. In addition, fund returns are sensitive to market movements**

***Keywords*- Balanced Funds, Conditional Models, ELSS, Equity Diversified, Market Timing, Stock Selection.**

I. Introduction

Indian mutual fund industry has registered remarkable progress in recent decade (www.amfiindia.com)[1]. In spite of tremendous growth of this delegated asset management industry, the concerns of fund managers' ability to augment value to their portfolios remain vital in investment process. Traditional measures of risk adjusted performance,[2] compare the fund returns with a benchmark. These measures are designated as 'unconditional'; as, these measures do not take into account the changes in the conditions of financial markets or the broader economic set up. Besides, they are based on the assumption that fund risks and expected returns are stable overtime. Since system is dynamic; consequently, fund risks and risk premiums register change over time; therefore, the traditional performance measures confound time variation with abnormal performance.

Unconditional techniques are, thus, incapable to capture the time varying element of expected returns. These measures assume that the systemic risk of a fund is stationary over time, so ignore the existence of timing activities of the fund managers. Due to time variation in actively managed funds, beta (systemic risk) is not time invariant. It may change due to time related factors, weights change in the portfolio due to change in market values and fund may experience large change in fund inflows and outflows which is beyond the control of the fund manager. Moreover, new information on the economy in general or/and on a particular company may change the relative risk of companies and, in turn, their expected returns. It is acknowledged in the financial literature that investor's expectations and variance of financial securities vary over time (Coggins et. al., 2004).

In the conditional performance evaluation approach, the fund manager's risk exposures and the related market premiums are allowed to vary over time along with the state of the economy. Hence, the time varying nature of investment risk should be incorporated into the funds' performance evaluation process (Merton, 1971). This belief gave rise to a new class of conditional performance evaluation models (Ferson and Schadt 1996; Ferson and Warther 1996; Christopherson et. al. 1998) that allow both funds' expected returns and risk to vary through time. The state of the economy is measured by using predetermined, public information variables. The conditional performance measure, the conditional alpha, is the difference between a fund's excess returns and that of a strategy that attempts to match the fund's risk dynamics over time based on the predetermined information variables.

Conditional Performance Evaluation, to large extent, is in harmony with a semi-strong form[3] of market efficiency (Fama, 1970). If the market is efficient, a fund manager cannot add value to stocks by using mechanical trading strategy. In order to add value and generate a positive conditional alpha, a manager should offer a higher return than the mechanical-trading strategy. Ferson and Schadt (1996) advocate using performance measures that are conditioned on public information variables in order to avoid the bias induced by using historical average returns to estimate expected performance. A profitable investment strategy relying on public information should not be seen as superior performance by managers. Therefore, traditional performance measures that assume constant risk may assign abnormal performance to a strategy based solely on public information. They propose performance measures in which the mutual fund beta is a linear function of public information as defined by a one-period lag of macroeconomic variables that have predictive power for future stock returns.

In this background, the present study is devoted to evaluate the performance of Indian mutual funds by using the conditional models. The existing performance evaluation models are conditioned by the public information comprising financial and macro variables. Technically, alphas and betas are conditioned with public information. Such results may be more useful for the investors to identify the selectivity and timing ability of the fund managers.

II. Literature Review

Some theoretical and empirical literature has come to light, over time, on conditional performance of mutual funds. The unconditional fund performance measurement assumes that investment risk is time invariant. Putting in other words, the

portfolio's betas are fixed for the whole observation period. This could make the performance unreliable because many empirical studies show that risks and returns are predictable overtime using economic variables such as dividends, interest rate etc. Moreover, it has been established in the literature that investment risk has time varying nature (Merton, 1970). Hence, the literature on conditional performance of mutual funds has emerged. Therefore, it has been realized that such phenomenon should also be considered while evaluating the performance. Conditional models are built on three assumptions. First, many studies have rejected the CAPM (Capital Asset Pricing Models) due to unconditional nature and evidences have suggested that risks and returns of stocks and bonds are predictable using dividend yields, interest rates and other economic variables. Second, the traditional measures assume that investors have unconditional expectations and any information used by fund managers can be considered as abnormal performance. However, if the market is semi-strong form efficient, as defined by Fama (1970), meaning that market prices fully reflect the public information; hence, a manager who adjusts a portfolio dynamically according to the readily available information should not be viewed as having superior performance. Finally, betas are a functional form due to time varying factor, which may be owing to three sources- the changing betas of underlying assets, the portfolio's re-weighting by active managers and the major fund flows in and out of a portfolio which can change the weight of a passive portfolio.

This conditional beta can be used to replace any of the betas in the unconditional model to capture a dynamic strategy on the part of a fund manager. Many studies incorporate the conditional beta and alpha for the portfolio performance evaluation and suggest that using a conditional model economically and statistically improves portfolio performance and makes performance more neutral (see Ferson and Schadt, 1996; Ferson and Warther, 1996; Sawicki, 2001; Roy and Deb, 2003). Ferson and Schadt argued that all the single and multi-factor measures are biased, since portfolio risk and returns are fixed through time (known as the unconditional measure). For this reason, they propose in their model a conditional measure which allows time-varying. They use both measures to investigate the performance of 67 mutual funds in the U.S. market during the period 1968-1990. They employ five predetermined variables for their conditional measure, namely- one month Treasury bills, dividend yield, slope of term structure, quality of spread in the bond market and a dummy variable for the January effect – and incorporate it with Jensen's single factor measure. Their results show that negative Jensen's alphas (unconditional) shifts and become positive when predetermined variables are included. They also apply their conditional method to Treynor and Mazuy's (1966) and Henriksson and Merton's (1981) market timing measures and use 3 self constructed buy-and-hold portfolios to test the market timing models, as well as data from 67 mutual funds. They conclude that the unconditional market timing models are misspecified, since the results show negative market timing performance even if they are in the buy-and hold strategy portfolios. When the conditional market timing measures are used, the negative timing coefficients disappeared. Therefore, they confirm that using their conditional model brings both statistical and economic significance and makes the performance of the funds look better.

In a similar way, Sawicki and Ong (2000), apply both unconditional and conditional Jensen's measures, as well as Treynor and Mazuy's market timing model to investigate Australian funds between 1983 and 1995, they found weak evidence of positive performance and negative market timing performance. In consistent to Ferson and Schadt (1996), they confirm the statistical significance of incorporating lagged information variables in the model, in particular with regard to dividend yield. They also confirm that the conditional model shifts the alphas to the right and makes funds look better. Dahlquist et al (2000) explores Swedish fund performance in broad fund classifications from 1993 to 1997, using a conditional measure. He revealed superior performance only for funds in the equity class.

Otten and Bams (2004) examined statistical and economic importance of adding more factors to the unconditional models by using 2436 US mutual funds (1962-2000) with Jensen and Cahart models with unconditional and conditional in alpha and betas. They revealed that conditional models add statistical and economic relevance to performance measurement. The Cahart model is the best in explaining mutual fund returns. At the aggregated level, alphas do not change much between unconditional and conditional models. At style level, moving to the richer models have large impacts on the alphas in income funds. In overall, US mutual funds generate insignificant negative performance. Size and B/M (book to market) factors have explanatory power for all style portfolios. Momentum factor has explanatory power for only three style portfolios. The growth/income portfolio is not statistically exposed to the momentum factor. Conditional model improves performance of funds and makes funds, in overall, look better except income/growth and income portfolios which conditional model decrease performance.

Luis Ferruz et al. (2006) evaluated mutual fund performance of Spanish mutual funds for 225 Spanish equity funds (1994-2002). He used conditional Jensen measure which incorporated seven predetermined variables, namely, dividend yields, T-bills, bond yield, variable that represent inverse wealth, term structure, quality spread, and dummy variable of January effect. Funds display negative alphas but performance improves when using measure. The conditional measure also improves explanatory power of the model.

However, studies of Becker et al. (1999), Holmes and Faff (2004), Saez (2008) and Afonso and Rodrigue (2014) showed little evidence of market timing even in a conditional framework. However, Blake et.al. (2015) found no evidence of timing and selectivity in the selective pension funds in U.K.

Guha Deb et al. (2007) examined the market timing and stock selection abilities of mutual fund managers using both unconditional and conditional approaches. Using 96 mutual funds schemes during January 2000 to June 2005 the study reported lack of market timing but presence of stock

selection abilities of Indian fund managers in both the approaches.

Roy et.al (2003) conducted an empirical study on conditional performance of Indian mutual funds. This paper uses a technique called conditional performance evaluation on a sample of eighty-nine Indian mutual fund schemes. This paper measures the performance of various mutual funds with both unconditional and conditional form of CAPM, Treynor-Mazuy model and Henriksson-Merton model. The effect of incorporating lagged information variables into the evaluation of mutual fund managers' performance is examined in the Indian context. The results suggest that the use of conditioning lagged information variables improves the performance of mutual fund schemes, causing alphas to shift towards right and reducing the number of negative timing coefficients.

Objectives

1. To compare Indian fund performance with the unconditional and conditional models.
2. To explore the fund factors sensitivities to fund returns with both conditional and unconditional situations.
3. To examine the trade-off, if any, between stock selection and market timing when the models are conditioned by public information variables.

III. Methodology, Data Base and Variables

This section highlights the data set used to evaluate performance of Indian mutual funds. Besides, the techniques that have been used to get the final results regarding performance evaluation are discussed in detail. Moreover, for the better understanding of readers, variables used are categorically defined and their significance in the mutual fund industry is also discussed.

This study is based on the 51 mutual fund schemes launched by the variety of fund houses. These mutual fund schemes are divided into three categories based on their characteristics namely; Equity Diversified Funds (28), Equity Linked Saving Schemes (ELSS) Funds (15) and Balanced Funds (8). Diversified mutual funds are equity funds which invest across divergent sectors and categories of the stock market and endeavor to moderate the risk exposures. An Equity Linked Savings Scheme (ELSS) is an equity oriented mutual fund scheme in which the majority corpus (about 80-100 percent) is invested in equities. It qualifies for tax exemption under section 80C of the Indian Income Tax Act, 1961. This type of fund scheme does not just help us to save tax, but also provide an opportunity to grow our money. A fund that combines stock, bond and sometimes money market component in a single portfolio are termed as balanced funds. Generally, 50-75 per cent is equity component and rest is in debt. Such funds are geared towards investors who look for mixture of safety, income and modest capital appreciation.

To study the fund performance, monthly data for the 51 schemes on the fund portfolio return has been used by using the Net Asset Value Data (NAV). Besides, to establish the capacity of fund to beat the benchmark, market data for relevant indices has been used.

This study covers the period from April, 2006 to December 2014. This period incorporates the periods of boom, stagnation and slowdown in the Indian economy in general and stock market in particular. Therefore, this period provides full opportunity to the fund manager to prove his capability in such economic scenarios and the importance of fund characteristics in changing macro-economic environment. The data belongs to this period for the fund schemes that came into existence before April 2006 and for those started after this period; data belongs from the year of inception to December 2014.

Data Source

Variable	Data Source
Treasury Bill Returns	www.tradingeconomics.com
FII Net Investment	www.fpi.nsdl.co.in
Inflation Rate	www.inflation.edu.com
Net Asset Value (NAV)	www.amfiindia.com
Stock Market Indices	www.bseindia.com / www.nseindia.com
Index of Industrial production	www.mospi.nic.in
Dividend Yield Value	www.bseindia.com / www.nseindia.com

Jenson's single factor regression based approach is used to establish the portfolio beta, that is portfolio returns effected by the systemic risk and alpha, popularly called Jensen's alpha, indicates the manager's performance coefficient. The Jenson's equation is shown in the following regression specification:

$$R_{pt} - R_{ft} = \alpha_j + \beta_p (R_{mt} - R_{ft}) + \varepsilon_{pt} \quad (1)$$

Where, R_{pt} is the rate of return of the fund at time t, R_{ft} is the contemporaneous rate of return on a risk free asset, R_{mt} is the rate of return of market portfolio at time t. β_p is the estimated coefficient for the systemic risk level of the fund, α_j is the Jensen's performance coefficient, indicating the risk adjusted performance of the fund and ε_{pt} represents the random error term. This regression equation assumes that the systemic risk of a fund is stationary over time and thus ignores the existence of timing activities of the fund managers.

The Jenson's model, thus, calculate the overall fund performance and all the credit goes to the fund manager in terms of its stock selection capability. However, the overall performance is a combination of stock selection and the timing ability of the manager and Jenson's model is unable to decompose the fund's performance in stock selection and timing ability. In this context, Treynor and Mazuy (1966), model separates the performance into market timing and selectivity components. The Treynor and Mazuy (1966) model is specified as follows;

$$R_{pt} - R_{ft} = \alpha_p + \beta_p (R_{mt} - R_{ft}) + \gamma_p (R_{mt} - R_{ft})^2 + \varepsilon_{pt} \quad (2)$$

In this equation, γ_p is the manager's ability to time the market movement and α_p is the expected return for portfolio p generated from the manager's selectivity skills. If the manager has successfully timed the market, γ_p will be +ve and significant and $\gamma_p = 0$ would be interpreted as no ability to time the market.

The single-index 'alpha model' has been the predominant approach to performance evaluation until recently when researchers began employing a multi-index model to improve the accuracy performance measurement. Both single - and multi index models, however, may suffer from another problem: time-variation in risks and expected returns that may be misinterpreted as superior selectivity or timing skills. If the market risk premium changes and the performance metric does not control for this, time variation in the market risk premium will be reflected in the estimate of abnormal performance and mistaken for manager under or over-performance.

Ferson and Schadt (1996) argue that evidence of return predictability using predetermined variables represents changing required returns. They propose a modification to the Jensen alpha and market timing models to incorporate conditioning information that allows for the estimation of time-varying conditional betas. Ferson and Schadt (1996) modify the traditional Jensen alpha model by adding a vector of lagged public information variables.

Ferson and Schadt (1996) point out that a profitable investment strategy relying on public information should not be seen as superior performance by managers. Therefore, traditional performance measures that assume constant risk may assign abnormal performance to strategy based solely on public information. They propose performance measures in which the mutual fund beta is a linear function of monthly public information as defined by a one period lag of macroeconomic variables that have predictive power for future stock returns. Hence, the conditional performance measures of Treynor and Mazuy (1966) and Henriksson and Merton (1981) are presented in the format which incorporates public information, that is the alphas and the betas are conditioned with the public information. This study proposed to use five return predictive variables for conditioning the alphas and betas. Among these, market dividend yield (DP) and short-term Treasury bill yield (TB) are used as important public information variables. It is further stated that variables influence market returns are those that change discount factors and expected cash flows, inflation rate (IF) is used as information variable. Further, changes in the level of real production affect the current value of cash flows and thereby market returns. So, growth rate of index of industrial production (IIP) is considered as another explanatory variable. Finally, monthly growth in net foreign institutional (FII) flows is taken as another macroeconomic variable. These variables are used in one period time lag format.

The Conditional Jenson's Model

$$R_{pt} - R_{ft} = \alpha_p + \beta_p (R_{mt} - R_{ft}) + C_p'[Z_{t-1}(R_{mt} - R_{ft})] \quad (3)$$

The Conditional Treynor-Mazuy Model

$$R_{pt} - R_{ft} = \alpha_p + \beta_p (R_{mt} - R_{ft}) + C_p'[Z_{t-1}(R_{mt} - R_{ft})] + \gamma_p (R_{mt} - R_{ft})^2 + \varepsilon_{pt} \quad (4)$$

Where, coefficient vector C_p' captures the response of manager's beta to the entire public information Z_{t-1} (represented by four variables in this study). The coefficient γ_p measures the sensitivity of the manager's beta to the private timing signal. The bias due to readily available information is controlled by the term $C_p'[Z_{t-1}((R_{mt} - R_{ft})]$. Rest of the terms in these equations is same as in the unconditional models.

Variables

Monthly returns: Since this study is based on the monthly returns of the fund schemes selected for analysis. The monthly returns for each of the sample scheme have been computed by the following equation;

$$R_t = (NAV_t - NAV_{t-1})/ NAV_{t-1} \quad (5)$$

Here; R_t is the monthly return of a fund scheme in month't'. Since the selected fund schemes are in growth option, hence the question to adjust the dividends in calculating the monthly returns does not arise.

Market Monthly Returns: Returns for the various market indices (R_m) used as benchmark, so market returns have been estimated;

$$R_{mt} = (\text{Market Index}_t - \text{Market Index}_{t-1})/ \text{Market Index}_{t-1} \quad (6)$$

Here; R_{mt} is the market return in period 't', Market Index_t and Market Index_{t-1} are levels of market index levels in periods 't' and 't-1' respectively.

Treasury Bill Returns: T-bills are like promissory notes issued by central government as a primary instrument for regulating money supply and raising funds via open market operations. T-bills are sold at discount and their returns being the difference between the purchase price and the par value (redemption value), as t- bills are sold on discount and devoid of explicit interest rate. Such bills are, generally, used risk free investments as being backed by the government's full faith and credit. Therefore, Treasury bill returns are used to as risk free returns to calculate the excess returns generated by the fund managers.

FII Investment: FIIs are those institutional investors which invest in the assets that belong to different country other than those where these organizations are based. Foreign institutional investors play a very important role in any economy. These are the big companies such as investment banks, mutual funds etc, who invest considerable amount of money in the Indian markets. With the buying of securities by these big players, markets trend to move upward and vice-versa. They exert strong influence on the total inflows coming into the economy. Hence, considerably influence the market returns and other parameters of the economy.

Inflation Rate: The inflation rate is the percentage rate of change of a price index over time. This study relies on consumer price index (CPI) to calculate inflation rate in Indian economy. Inflation rate in the economy is an important macroeconomic variable that influence the returns and a source of public information regarding the fragility of the economy.

Index of Industrial Production (IIP): An index of the total output from manufacturing, mining and utility companies. It is seen as an indicator of macroeconomic trends. A high IIP indicates economic growth. This variable is a key public information variable, hence exclusively introduced as a conditional variable in the mutual fund performance models.

Dividend Yield Value: Dividend yield equals the weighted average across the market index of each individual public firm's dividend paid divided by share price.

IV. Empirical Findings and Discussion

Selectivity in Jensen's Conditional Model

This section is concerned with the performance of mutual funds overtime. Table-1 reveals the performance measured by Jensen's Alpha taking into consideration both conditional (equation-3) and unconditional measures (equation-1).

Table-1: Jenson Performance Measure (Panel Data)

Fund Category	Unconditional		Conditional	
	Alpha	R^2	Alpha	R^2
All Sample Funds	0.3289 (5.33)	0.6278	0.4205 (44.41)	0.6305
Equity Diversified	0.3498 (4.01)	0.6078	0.4315 (23.85)	0.6128
ELSS	0.3480 (2.99)	0.6842	0.4597 (14.11)	0.6867
Balanced	0.2172 (1.97)	0.6742	0.2862 (6.69)	0.6766
Individual Levels (Number of Positive and Negative [ ] Funds				
	Unconditional		Conditional	
All Sample Funds	47 [4]		46 [5]	
Equity Diversified	26 [2]		25 [3]	
ELSS	14 [1]		14 [1]	
Balanced	7 [1]		7 [1]	

Values in Parentheses in upper block are t-values

Unconditional Jensen's alpha captures the stock selection capability of the fund manager, that is, whether he can add value to the portfolio by selecting appropriate stocks. Since it is not conditioned by any other information; hence, termed as unconditional alpha. Table-1 reveals that fund managers of Indian mutual fund industry have stock selection capability; for, the alpha in all fund categories and in aggregate turned out to be positively significant. Highest performance is registered by the equity diversified category (0.3498 value of alpha coefficient) followed by the ELSS category (0.3480 value of alpha coefficient), all sampled funds (0.3289) and the least performing segment proved to be balanced funds (0.2172). When the funds' portfolio is diversified, then it has scope to perform better than other funds due to opportunity of hedging or spreading of risks across the sectors. Equities linked saving schemes (ELSS) are also diversified funds and are also performing at almost same footing. In this category of funds, the fund manager has better flexibility to use the funds; as, the redemption pressure is very less given the lock in period provision. The investors are permitted to withdraw the money only after a few years. However, explanatory power of unconditional Jensen's model is highest in the ELSS model followed by the balanced funds. This power is least in the case of equity diversified funds. What is the explanation of such phenomenon? In case of equity diversified funds, role of market movement is highest, and markets are unpredictable. However, markets are more predictable in other categories of mutual funds as the relatively higher level of explanatory power.

The situation has changed to some extent, when the fund returns are conditioned by the public information variables (equation-3). The Jensen's alpha has improved to some extent in all categories of mutual funds along with the improvement in the explanatory power of the Jensen's model. Therefore, it can be concluded here that use of public information which has direct bearing on the stock market, fund managers' can improve the stock picking ability. ELSS and diversified funds proved to be best funds so far the selectivity capability of fund managers is concerned. So far the performance of individual fund schemes is concerned, positive and negative performing fund schemes remained same except for one shifting from positive performance in the equity diversified categories. Therefore, fund managers should be capable to process the public information that is available to all, to adjust the portfolio for better returns.

A study by Ferson and Schadt (1996) suggests that the unconditional performance measure leads to negative performance because the betas of mutual funds are negatively related to the expected market return, which moves together with its volatility. Therefore, when time variation in beta is controlled, mutual fund performance improves and shifts the alphas to the right. Studies by Ferson and Warther (1996), Sawicki and Ong (2000) and Roy and Deb (2003) also confirm these findings. The results of this study are also in the same line.

Selectivity and Market Timing Ability

Timing ability is the ability of a fund manager to adjust his portfolio's risk according to the expected change in economic situation. The timing ability model separates timing ability from selectivity ability and if the manager has timing ability the square term of the market return should be positive and significant (Equation 2 & 4).

Table-2: Panel Data Results for Selectivity and Market Timing (Conditional TMM Model)

Fund Category	Unconditional		Conditional	
	Selectivity	Market Timing	Selectivity	Market Timing
ALL	0.4042 (5.9847)	-0.0018 (2.7734)	0.4205 (44.4083)	-0.0034 (30.2101)
Equity Diversified	0.4147 (4.3284)	-0.0015 (1.6287)	0.4315 (23.8540)	-0.0038 (17.903)
ELSS	0.4701 (3.7429)	-0.0032 (2.5481)	0.4597 (14.1119)	-0.0032 (7.5441)
Balanced	0.2726 (2.2563)	-0.0012 (1.1283)	0.2862 (6.6963)	-0.0004 (0.9278)

Note: Figures in parentheses are t-values

The table-2 reveals the results of the Treynor and Mazuy model (TMM) of selectivity and market timing. The results of market timing ability in both conditional and unconditional models are negative, meaning thereby Indian mutual fund industry is devoid of market timing ability. Rather, it plays perverse in the market returns. That is any effort by the fund managers to improve the returns by timing the market could not succeed. This is true in both the conditional as well as the unconditional models. The public information did not fructify in market timing ability.

Moreover, so far as the stock picking ability is concerned, it has been proved in the Jensen's model and this model that Indian mutual fund industry has stock picking ability. This ability has improved to some extent when the model is conditioned with public information except the ELSS category. It can be concluded in this section that Indian mutual fund industry has stock selection ability but lacking market timing irrespective of the public information.

Relationship between Selectivity and Market Timing

Can a fund manager behave holistically, that is, he shows all capabilities simultaneously? If any fund manager is highly capable then he may show prowess picking the performing stocks and can time the market accurately, then his performance will turn out to be marvelous. It can be other way round, that there is trade-off between the market timing and stock selection. To answer this question in Indian mutual fund industry, correlation between the market timing coefficient and stock picking coefficient has been estimated in the 51 sampled fund schemes. Moreover, same has been calculated in the categories chosen namely-equity diversified, ELSS and balanced funds. Results are presented in the table-3

Table-3: Correlation between the Selectivity and the Market Timing (TMM Model)

Fund Category	Correlation (ρ)	Funds with Opposite Sign (%)
ALL	-0.4382	60.78
Equity Diversified	-0.2222	67.85
ELSS	-0.5222	53.33
Balanced	-0.0385	50.00

The table exhibits negative correlation in the stock selection and market timing ability. Meaning thereby, when the fund manager is able to show his strength in one type of capability he is lacking the same in the other. He is unable to prove his strength simultaneously. For, the correlation coefficient is -0.4382 and the 60.78% fund schemes have shown opposite sign. So far the categories of funds in this context are concerned, correlation value (-0.0385) is observed least in balanced funds and 50% of the sampled balanced funds observed opposite sign. Negative correlation coefficient (-0.5222) is highest in ELSS category. This value is relatively smaller in equity diversified funds category (-0.2222). It can be concluded in this section that fund managers in Indian mutual fund industry are unable to show prowess in both the capabilities simultaneously.

Fund Factor Sensitivities

This section of the discussion is devoted to sensitivities of the fund returns to market in unconditional model and market and other factors in the conditional model. As we are aware with the fact that funds with high and significant value of beta, returns are prone to change with the change in market conditions. In this context, panel data has been estimated and the sensitivities are presented in the table-4.

Table-4: Fund Factor Sensitivities (Panel Data)

Fund Category	Unconditional	Conditional				
	$Beta_m$	$Beta_m$	$Beta_{if}$	$Beta_{dp}$	$Beta_{iip}$	$Beta_{fii}$
All Sample Funds	0.8318 (88.24)	0.9872 (73.91)	-0.0102 (17.51)	0.1163 (26.52)	-0.0015 (17.74)	0.0001 (6.37)
Equity Diversified	0.8521 (64.84)	1.2473 (50.15)	-0.0143 (10.74)	0.1441 (19.43)	-0.0032 (18.88)	0.0001 (5.06)
ELSS	0.9058 (48.44)	0.9033 (17.89)	-0.0041 (2.77)	-0.0369 (1.81)	0.0005 (1.75)	0.0001 (2.95)
Balanced	0.6799 (41.07)	0.7864 (12.48)	0.0109 (3.31)	-0.0088 (0.34)	-0.0012 (2.81)	0.0001 (3.33)

Individual Levels (Number of Positive and Negative [ ] Funds

	Unconditional	Conditional				
All Sample Funds	51 [0]	46 [5]	16 [35]	22 [29]	22 [29]	27 [24]
Equity Diversified	28 [0]	26 [2]	9 [19]	12 [16]	9 [19]	15 [13]
ELSS	15 [0]	12 [3]	6 [9]	7 [8]	9 [6]	10 [5]
Balanced	08 [0]	8 [0]	7 [1]	3 [5]	4 [4]	2 [6]

Values in Parentheses upper block are t-values

In the aggregate fund category, fund returns sensitivity to the market is very high in the unconditional model. The coefficient of $beta_m$ (0.8318) turned out to be positively highly significant. It can be termed as high beta funds and this is true for all the fund schemes in the sample. Same result is also true in the fund categories. All fund categories have witnessed high fund return sensitiveness to market movements. This value is highest in the case of ELSS (0.9058) followed by equity diversified (0.8521) and turned out least in the case of balanced funds (0.6799). The less value of coefficient is obvious, given the nature of the fund category.

What happened to fund returns sensitiveness when the models are conditioned with public information. Interestingly, the value of market coefficient has improved in aggregate and fund categories. Even, this value has increased to more than one in equity diversified fund category. In spite of high sensitivities to market, 5 fund schemes (2 in equity diversified category and 3 in ELSS category) shifted to negative sensitiveness.

What about the fund returns sensitivities to inflation ratio? Its value is negative in all categories except for balanced funds. Given the nature of the balanced funds, the returns are positively affected by the inflation. In spite of these results 9 fund schemes in equity diversified, 6 in ELSS and 1 in balanced have shown positive relationship. In nut shell, it can be inferred that inflation has negative relationship with the fund returns except the balanced fund category.

Dividend yields, generally, has the potential to boost the market. But this variable turned out to be insignificant in ELSS and balanced fund categories. Whereas, this coefficient is positively significant in case of equity diversified fund category. Even then fund schemes in negative segment are dominating. It can be concluded here that dividend yields effect is not even to all fund schemes and categories.

Industrial production is an indicator of positive growth in the economy. It is a signal to the market to perform better. This has been measured by index of industrial production (IIP). Its coefficients are either negatively significant or insignificant. Contrary to the established belief, index of industrial production is negatively impacting the fund returns. Why did this happen? This is a matter of further investigation and can be addressed in a separate research.

It is an established fact that Indian stock market is driven by the inflow of foreign institutional investments. More flows are positively reflected in fund returns. This has been proved true in Indian mutual fund industry as all coefficients, albeit small, turned out to be significant in all

fund categories. However, at individual levels more than 40% have reported this value negative.

V. Concluding Remarks

This study evaluates the performance of mutual funds based on the 51 mutual fund schemes between 2006 and 2014. This study uses conditional models to evaluate performance, meaning thereby it is based on the semi strong form market efficiency model of Fama. The study reveals that Indian mutual fund managers have strong stock picking ability. Moreover, use of public information which has direct bearing on the stock market, fund managers can improve their selectivity ability. Fund manager should be able to process the public information to adjust its portfolio for better returns. Indian fund managers are devoid of market timing ability and even public information did not fructify to improve the market timing capability. Besides, there is a tradeoff between the selectivity and market timing ability, that is he is unable show his prowess in both the categories simultaneously.

Fund returns are very much sensitive to market movements. Inflation rate is negatively related to fund returns except the balanced fund category. Contrary to established belief that industrial production is positively related to returns do not hold true in mutual fund returns in India. Since Indian stock market is driven by the FII flows and this variable has positively reflected fund returns.

End notes

1. More than 8000 billion rupees are involved in Indian mutual fund industry now.
2. Such as Treynor Ratio, Sharpe Ratio and Jensen' alpha etc.

This class of Efficient Market Hypothesis suggests that only information that is not publicly available can benefit investors seeking to earn abnormal returns on investments. All other information is accounted for in the stocks' price and, regardless of the amount of fundamental and technical analysis one performs, above normal returns will not be had

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