MASTERSHARES : ENIGMATIC PERFORMANCE

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Samir K Barua & Jayanth R Varma

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ABSTRACT

In this paper we have examined the performance of
Mastershares, the first all equity close ended growth
fund established by the Unit Trust of India (UTI) in
the country, using the various portfolio performance
measures that have been suggested in the literature.
We found that while in terms of return on the Net Asset
Value (NAV) the fund has out-performed the market, in
terms of returns based on Market Prices it has shown a
mixed performance. On further investigation, we inferred
that the excellent performance in terms of NAV could neither
be ascribed to selectivity nor to timing of decisions.
The explanation possibly lies in UTI's acquisition of
stocks in the primary market at well below prevailing
market prices and in the manner of allocation of stocks
to various funds managed by the Trust. Our analysis also
revealed that the market quite irrationally inflates the
volatility of the market price of Mastershares as compared
to the volatility observed in the NAV. This observation
which implies market inefficiency is in line with the
recent researches done in the developed capital markets.

Introduction

Mastershares is the first close ended Mutual Fund in the
Indian capital market. It was launched by the Unit Trust of India
(UTI) in September 1986. Though the initial plan was to limit the
size of the fund to Rs. 50 crores, since the issue was
oversubscribed, UTI decided to retain the entire amount of Rs.
150.43 crores collected from the market. Subsequently, in March
'89, another Rs. 82.84 crores were added to the fund through a
rights issue at a premium of Rs. 2. The total corpus as of today
therefore is Rs. 233.27 crores.

Since Mastershares was conceived as a growth fund, the major

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portion of benefit was expected to be in the form of capital gains. Therefore, the fund has almost exclusively been invested in equity. The letter of offer for the rights issue in 1989 mentioned that the entire capital of the fund was invested in a basket of 112 growth oriented shares from 17 industries. The annual report of UTI for 1989 also stated that the Fund was invested in a portfolio of 137 scrips in 18 industries. More recently, in an interview published in August 1-14, '90 issue of Business World, Mr. K.N.Atmaramani, General Manager (Finance & Investment) of UTI said that about 93% of the Fund was deployed in equity. Thus, it is clear that since inception, a large part of the Fund has always been invested in equity.

The redemption of Mastershares would commence at the discretion of the fund after 19th October 1993, that is, seven years after the issue, on terms specified by the UTI. The redemption price would be based on the Net Asset Value (NAV) arrived at by dividing the market value of the fund, net of provisions to be made for costs of winding up the fund, by the number of mastershares outstanding. In the intervening period, to ensure liquidity, the Mastershares have been listed in all the leading stock exchanges in the country. The UTI also computes and announces the NAV of the Mastershares periodically, generally once a week. The time lag between the date of computation of NAV and the date of announcement of new NAV varies from 2 to 7 days.

The UTI had made it clear at the time of issue that there would be no obligation to distribute any fixed percentage of income, since the primary purpose was to provide growth. However, the dividend distribution on Mastershares has been quite good.

The Market and Mastershares

Since Mastershares was the first close ended all equity fund, the UTI was from the very beginning very keen to ensure that the fund showed excellent results. The then Chairman of UTI, Mr. Pherwani, stated that the fund would outperform the market through judicious construction of a well diversified portfolio. Even at that time, academics were skeptical about such an assertion [1] based on the evidence in western capital markets where Mutual Funds have not outperformed the market.

How have Mastershares fared in the market? The mastershares have almost always quoted below their NAV. In the first two years, till about middle of 1988, the market price was about 25% below the NAV. Since then however the spread has been reducing, possibly

because of the sea change in the equity market. In fact, for a brief period in August/September '90, the price crossed the NAV. In the last few months the discount has been about 6%. Today, in fact, Mastershares are fancied by investors.

There is prima facie every indication that Mastershares have been quite successful. In this paper, we would examine rigorously whether the Mastershares have indeed outperformed the market, after taking into account the riskiness of the fund's portfolio. If we conclude that they have, then we would further investigate to unravel as to how they could do so. Was it through superior information about scrips? Was it through superior analysis, leading to appropriate timing of portfolio revisions? The period of analysis is from July '87 to September '90, as the UTI started computing and announcing the NAVs of Mastershares periodically from June 1987 onwards.

Methodology for Evaluating Performance

The approach used for examining the performance of Mastershares is based on the Capital Asset Pricing Model (CAPM), proposed and developed by Sharpe [2], Lintner [3] and Mossin [4]. The model specifies that in equilibrium, the return on a security (or a portfolio of securities) would be given by :

$$r_i \quad = \quad r_f + \text{ß} (r_m - r_f) \qquad \ldots \quad \ldots \quad (0)$$

where r_i is expected return on security (or portfolio) i

   r_m is expected market return

   r_f is the risk-free return

   ß   is the measure of systematic risk of the security
         or portfolio

The estimable form of CAPM is known as the Market Model which is specified as follows :

$$r_t \quad = \quad \alpha + \text{ß} r_{m,t} + e_t \qquad \ldots \quad \ldots \quad (1)$$

where r_t is the return in period t

   $r_{m,t}$ is the market return in period t

   e_t is the error term

   α is the constant term which depends on r_f and ß

We used the All Industries All India Equity Index computed by Economic Times (ET Index) as the Market Index. The performance of

Mastershares based on NAV and on market price has been evaluated separately. The ET index, the NAV and the market price of Mastershares were collected for all the dates as on which the UTI computed the NAVs (hereafter called the computation dates).

We used daily returns to estimate the coefficients in (1). The returns were computed assuming continuous compounding. Since the number of days between two successive computation dates varied considerably, the daily equivalent returns for each period were computed as follows :

$$r_{NAV,t} \quad = \quad 1/T \; [\ln(NAV_t/NAV_{t-1})] \qquad \dots \qquad \dots \quad (2)$$
$$r_{MP,t} \quad = \quad 1/T \; [\ln(MP_t/MP_{t-1})] \qquad \dots \qquad \dots \quad (3)$$
$$r_{m,t} \quad = \quad 1/T \; [\ln(I_t/I_{t-1})] \qquad \dots \qquad \dots \quad (4)$$

where T is the length of period t in days
NAV_t is the NAV at the end of period t
MP_t is the market price at the end of period t
I_t is the ET Index at the end of period t

Regression Results : NAV

We regressed the return on NAV against the return on the ET Index for the period July 1987 to September 1990, and obtained the following result :

Time period	No. of observations	α^*	β^*	R^2
Jul87-Sep90	167	0.000796 (5.5)	0.832 (22.5)	0.755

* The t-values are in the parentheses

To investigate whether the coefficients changed over time, the coefficients were estimated for six month time spans (the last time span was nine months). We observed that the estimated value of ß was distinctly smaller for the first one year (July '87 to June '88) as compared to the rest of the period. Therefore, we divided the time span into two segments and the two sets of estimates were as follows :

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Time period	No. of observations	α^*	β^*	R^2
Jul87–Jun88	52	0.000716 (4.06)	0.482 (11.5)	0.724
Jul88–Sep90	115	0.000620 (4.00)	1.044 (25.5)	0.852

* The t-values are in the parentheses

The coefficients were different from zero at very high level of significance. As stated by UTI Executives on several occasions in the last three years the entire corpus of Mastershares funds is invested in a very well diversified portfolio of stocks. Therefore, a priori, one would expect the beta coefficient to be 1 and the performance no different from the performance of the market. While the estimated value of beta is as expected, the estimated value of _ points to returns well above the market returns. This will be discussed later.

Regression Results : Market Prices

We expected to get results similar to those obtained using NAVs. However, we were in for a surprise. The ß coefficient for returns based on market prices turned out to be much higher than that for NAV returns.

Time period	No. of observations	α^*	β^*	R^2
Jul87–Sep90	154	0.000357 (0.72)	1.121 (8.65)	0.330

* The t-values are in the parentheses

As in case of NAV, we broke up the time span into six month periods to investigate variations in the estimates of the coefficients. The ß coefficient estimates varied significantly from period to period as tabulated below :

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Time period	No. of observations	α^*	β^*	R^2
Jul87–Dec87	20	−0.000240 (−0.26)	0.260 (0.94)	0.047
Jan88–Jun88	27	0.000841 (0.92)	0.750 (3.19)	0.290
Jul88–Dec88	21	−0.000383 (−0.18)	1.837 (3.29)	0.364
Jan89–Jun89	28	0.000035 (0.03)	0.860 (2.11)	0.146
Jul89–Dec89	23	0.000231 (0.35)	1.075 (4.56)	0.498
Jan90–Jun90	22	0.000086 (0.14)	0.856 (4.40)	0.492
Jul90–Sep90	13	−0.000685 (−0.17)	1.776 (2.96)	0.443

* The t-values are in the parentheses

We are unable to explain the large variations in the estimate of ß, particularly when the NAV beta after the first year has been very close to one (as it is expected to be). It also appears from the results that, in general, in the second half of a year, the betas are higher than in the first half. Since beta coefficient is a measure of risk of security, it is inexplicable as to why in certain periods of time the market would behave as if the mastershares were far riskier than the index itself.

The Total Portfolio Variance

Since Mastershares has an extremely well diversified portfolio, one can regard it as an efficient portfolio. Therefore, one can express the risk of the Portfolio as the annualized standard deviation of return, known as volatility. The computed returns and volatilities of NAV, MP of Mastershares and the ET Index are as follows :

	NAV	Market price	ET index
Mean return	70.60%	70.60%	41.40%
Volatility (_)	18.31%	41.31%	19.44%

It is quite clear that the risk of Portfolio as measured by the volatility of returns is extremely high for the market prices of Mastershares particularly when compared with the volatility of NAV returns and market returns.

Risk Adjusted Performance

We compared the performance of Mastershares based on Nav and market price against the market portfolio represented by the ET index using the various measures of performance which have been suggested in the literature.

Treynor [5] assumes that the investor can eliminate the unsystematic risk by holding a diversified portfolio. Hence his measure of performance (T_p) is the excess return (over the risk-free rate) per unit of systematic risk (beta).

$$T_p = (r_p - r_f)/\beta_p$$
where r_p and β_p are the return and beta of the asset.

Sharpe [6] assumes that the investor invests a large fraction of his equity portfolio in the mutual fund and, therefore, cannot eliminate the unsystematic risk. The Sharpe measure of performance (S_p) is the excess return per unit of total risk (sigma).

$$S_p = (r_p - r_f)/\sigma_p$$
where σ_p is the volatility of the asset.

The Jensen measure of performance [7] is simply the return in excess of the equilibrium return mandated by the CAPM.

$$J_p = r_p - [r_f - \beta_p(r_m - r_f)]$$
where the term within square brackets is the equilibrium return.

The Fama decomposition [8] breaks down the observed return into its components :

1. The risk-free rate of return r_f
2. The impact of systematic risk $\beta_p(r_m - r_f)$
3. The impact of imperfect diversification $(\sigma_p/\sigma_m - \beta_p)(r_m - r_f)$
4. The net superior returns due to selectivity
   $(r_p - r_f) - (\sigma_p/\sigma_m)(r_m - r_f)$

The computed values of all these performance measures are as follows :

	NAV	MP	Index
Data			
Sigma(σ_p)	18.31%	41.31%	19.44%
Return(r_p)	70.60%	70.60%	41.40%
Beta(β_p)	0.832	1.121	1.000
Measures			
Treynor	0.705	0.523	0.294
Sharpe	3.201	1.418	1.512
Jensen	34.15%	25.65%	0.00%
Fama			
Riskfree Return	12.00%	12.00%	12.00%
Risk	24.45%	32.95%	29.40%
Diversification	3.23%	29.51%	0.00%
Net Selectivity	30.92%	−3.87%	0.00%
Total Return	70.60%	70.60%	41.40%

If the NAV is examined, the Mastershares is found to outperform the market by a significant margin on all measures of performance. The gain through selectivity is as high as 30.92% per annum.

The performance of Mastershares in terms of market prices is much less impressive on all four measures as compared to NAV. This is because the market price has a much higher beta than the NAV and also a much higher total variance. This means that whether one uses total risk or systematic risk as the measure of risk, the market price is more risky than the NAV. A part of the abnormal return earned by Mastershares is then needed to compensate the investor for the higher risk.

In fact, on the basis of total risk Mastershares has not done as well as the market. This is indicated by the Sharpe and Fama measures. However the Treynor and Jensen measures indicate that Mastershares has outperformed the market if only systematic risk is considered.

The abnormal returns observed in case of NAV of Mastershares are not amenable to any easy explanation. Since the portfolio is so well diversified, and the beta coefficient is close to 1, the portfolio is practically replicating the market. Therefore,

selectivity of stocks could hardly be the reason for abnormal performance.

Could timing of transactions explain the results? Given that an institution like UTI cannot frequently be in and out of the market, without adverse price impact for itself, this appears unlikely. Nevertheless, to explore the impact of timing, we estimated abnormal returns for six months intervals, beginning July '87. We found that the excess return persists right through. As another test of the timing gains, we divided the period into two sub-samples. The "downswing" sub-sample consisted of those periods in which the realized market return was negative. The rest of the sample consisted of the "upswing" sub-sample. The timing hypothesis implies that Mastershares has some capability to forecast the market return and uses this to move in and out of the market reducing its market exposure when the market is expected to go down. If this is so, the beta of the Mastershares portfolio should be lower in the downswing period. The regression results showed that the betas were not significantly different in the two sub-samples : the ß for the upswing periods was 0.78 and that for the downswing periods was 0.75. This establishes that timing gains were not present.

The most plausible explanation for the abnormal returns therefore appears to be acquisition of shares at well below market prices from the primary market either through direct allotment from a public issue or upon conversion of debt. Another possible explanation could be the policy of UTI on allocation of securities to various schemes managed by it.

Relation between NAV and Market Price

Since the NAV is computed using the market prices of shares, it represents the current market value of the portfolio held by Mastershares. Unlike the book value for an ordinary company, the NAV can, with some adjustments for liquidation costs and management expenses, be regarded as the "fundamental value" of the Mastershares. Hence, one would expect the market price to move in tandem with this fundamental value. It is difficult to test this hypothesis directly as the NAV is published only at
weekly intervals, and even on the date of publication is a few days old. The market would use the latest published NAV to estimate the current NAV and price the Mastershares accordingly. When a new NAV is announced, the market price would be affected only if the announced NAV diverges from the previous estimate. In other words, the market price would respond only to unanticipated

changes in NAV.

To estimate the current NAV using the latest available NAV, we use the market model (1). We compute the return earned on the market (ET) index from the date of the last NAV to the current date. The market model then gives the expected return on NAV during the same period. This estimate of the return is then converted into an estimate of the current NAV. When a new NAV is announced, the current NAV is re-estimated using the new value. The change in the estimate of NAV due to this new value is defined as the unexpected change in NAV.

$$NAV_u = NAV_e - NAV \qquad\qquad \dots \quad \dots \quad (5)$$

where NAV_u is the unexpected change in NAV

NAV_e is the estimated value of NAV using the model (1) and estimates for the period July 88 – Sept. 90

NAV is the net asset value announced by UTI

The impact on market prices would take place on the first trading day on which the new NAV was publicly available. To estimate this impact, we again need to account for the market factor. Even in the absence of any fresh information about Mastershares, the price of the Mastershares would change in conformity with the change in the market index. We first estimate the market model relating returns on Mastershares prices to returns on the market index. For this purpose, the price series used was the prices on the computation days. We use the above market model and the actual return on the market index to estimate the expected return on the Mastershares prices on the announcement day. This expected return is converted into an expected price of the Mastershares; this is the price that should have prevailed in the absence of any specific information about Mastershares. The difference between this price and the actual price is defined as the abnormal change in price, and is attributable to the impact of fresh information.

$$MP_u = MP_e - MP \qquad\qquad \dots \quad \dots \quad (6)$$

where MP_u is the unexpected change in market price (MP)

MP_e is the estimated value of MP using the market model and estimates for the period July 88 – Sept. 90

The hypothesis then is that the unanticipated change in NAV is an important variable explaining the abnormal change in price on the announcement day. The resulting regression specification would be :

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$$MP_u = a + b\ NAV_u \qquad \qquad \dots \quad \dots \quad (7)$$

The estimated value of b turned out to be statistically indistinguishable from 0 (t-value of 0.35), and the value of R^2 turned out to be 0.001, implying that the two variables did not have the expected linear relationship.

This result is counter to what one would expect in a market dominated by rational investors, and suggests that the market may indeed be governed by irrational considerations. Price movements divorced from fundamentals could be the reason for the much higher volatility and beta of the market prices of Mastershares as compared to the NAV.

These results seem to be in line with some of the current work being done on irrationalities in the market. These researches [9,10,11], which are reviewed along with other work in [12], point out that many a time market seems to add to the variability of returns on a scrip without any basis in the fundamentals of that scrip.

Conclusion

The Mastershares in terms of NAV have out-performed the market and the assertions made by the executives of the Trust at the time of establishing the Fund stands vindicated. However, how the superior performance has been achieved is a mystery, defying an explanation through statistical analysis. A possible explanation could lie in the policy of the Trust on allocation of shares acquired from the primary market (at prices well below prevailing market prices) to different schemes. Verification of such conjectures is impossible from secondary data.

The performance of Mastershares based on Market Prices is mixed. The explanation for this possibly lies in the irrational inflation of volatility of prices over the volatility of the fundamental value, the NAV. We concluded that the market is inefficient in this regard and is no different from the more developed capital markets where a similar phenomenon has been observed.

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