Do Prices Reflect the Performance of Government Controlled Closed-End Mutual Funds? A Panel Data Analysis from Bangladesh Perspective

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Abstract

Investigating a comment by John C. Bogle that the changes in the mutual fund industry have benefitted the asset managers not the investors, this article adds a new dimension to his notion. For countries like Bangladesh, where only 1% market capitalization of mutual fund and one-third of mutual funds are government controlled, investors have only the prices to get insights into the underlying assets of mutual funds. So whether prices can really reflect the underlying performance of mutual funds comes as a valid question. In this article, we have studied the closing price and security wise investment of a representative sample of government-controlled mutual funds for last seven years. Then we have considered a panel of the returns with closing price and time dimension. Using pooled OLS estimator, we have estimated the price coefficient against returns and found that changes in prices have little effect on the changes of underlying securities returns. This result violates all the prior analysis on performance indicators based on price returns and gives a concrete proof that while taking investment decision on those mutual funds, investors remain blind sighted. This study inspires to innovate something new for those blind-sighted investors.

Keywords
Closed-End Mutual Fund, Panel Data, Pooled OLS, Closing Price, Real Return, Government Controlled Asset Manager

1 Introduction

"In the aggregate, the fundamental changes in the mutual fund industry during the past 60 years have benefited mutual fund managers, not mutual fund investors."

- John C. Bogle, (Jan. - Feb., 2005)

With 55 years of experience in the mutual fund industry, Bogle, (Jan. - Feb., 2005) has made this comment. This should attract the attention of the analysts to find ways by which the general investors can be benefitted. General investors normally look at the prices of the instruments available for them in the capital market. Apparently, the movements of the prices give them the first indication of the risk or volatility level of any particular stocks. Analyses are made to innovate performance indicators that would help the general investors take on informed decisions. But one question remains that whether the price of the mutual funds universally reflects the performance of the underlying investment.

According to weak market hypotheses, prices should reflect the available information regarding the performance of underlying securities. In the developing countries, where the capital markets are not close to any market of developed countries in terms of investor awareness, whether this hypothesis holds should be a matter of analysis. If this hypothesis does not hold, all the performance indicators based on the prices of mutual fund would not be applicable. It is undeniable that to get the investors benefitted in its truest sense, they should be enabled to take an educated investment decision.

The mutual fund market size in Bangladesh is very tiny with respect to her neighboring countries. Size in the DSE (Dhaka Stock Exchange) market capitalization is only 1% (DSE, 2016-2017). At the beginning of the FY 2016-17, total 36 Mutual Funds were listed with a unit value of Tk. 46,112 million and market value of Tk. 30,284 million. During the FY 2016-17, 3 new mutual funds were listed through IPO with a unit value of Tk. 3,088 million. 3 mutual Funds were delisted during the FY2016-17. At the end of FY 2016-17 total number of listed mutual funds stood 35 with a unit value of Tk. 50,368 million and market value of Tk. 42,501 million. In FY 2016-17 Market PE of Mutual Fund is 12.97. There is no trading platform of open-ended mutual fund yet, therefore, only closed-end mutual funds are traded. Of the 35 mutual funds, 11 are managed by a government-controlled institute, ICB (Investment Corporation of Bangladesh). In this study, we have tried to analyze five of these government institute controlled mutual funds.

When the government is involved in any issue of any developing country, bureaucracy comes along with it. In that bureaucratic crowd, the reporting quality of those institutes often remains below the mark. Therefore, for investing in funds controlled by them the investors have only the trading prices. Using the trend of the prices, investors get insights into the risks and volatility. There have been a number of studies that are based on the prices of mutual funds. Hence, comes the question of whether price can reflect the performance of the underlying securities. This study tries to find that question. In the next chapter, all the concerned works of literature are analyzed with their findings. Then we build up our theoretical framework on the basis of which we have designed our analysis. In the end, we give the results of the analysis with their implications and indicate the next analyses that can be done considering our analysis a benchmark.

2 Literature Review

According to market hypotheses, the price of the instruments of a capital market should be reflective of the performance of underlying assets. At the very least price should reflect the impact of available and published information of the underlying assets' performance. The reflection of the impacts tends to vary with the scope and ownership of the stock or fund. For open-ended mutual funds, the reflection should theoretically be instantaneous and by the process they are. But for a closed-end mutual fund, each unit of share is like ordinary share and traded similarly. The price mechanism can largely be attributed to the demand-supply condition of the market and the demand-supply condition may not be any representation of the performance of the underlying asset. This gives a window of opportunity to the fund managers to play around with the fund willfully by remaining in the minimum of regulations. It becomes then necessary to track the performance trend of the fund to help general investors take on the mutual fund picking decisions. They should have an idea of the trend that the fund is following.

Mutual fund performance depends on a large number of factors ranging from the educational background of respective fund managers (Ellison & Glenn, 1999) to the commission, investment expense, incentives that asset managers get on the performance of the fund (Reuter, 2006; Eltonm, et al., 2003; Brown, et al., 1996; Carhart, 1997). Many have tried to predict the performance of the mutual funds or find the relationship with the past performance (Grinblatt & Titman, 1992). The techniques used ranged from normal OLS to Bayesian and bootstrap statistical techniques (Kosowski, et

al., 2006). In the beginning, the majority of the measures were based on ordinary least squares (OLS) estimation of factor model regressions. In two early studies, Jensen (1968, 1969) uses the single-factor Capital Asset Pricing Model (CAPM).

Subsequently, the factor-based models evolved along with empirical asset-based literature to incorporate passive assets such as size, book-to-market (Fama and French (1993)), and momentum (Jegadeesh and Titman (1993)). Besides relying on the least squares methods to predict the performance of mutual funds studies typically use passive asset returns that are contemporaneous with fund returns. In 2002, Pastor and Stambaugh (PS, 2002a) laid the basement of Bayesian methods in this arena.

Busse & Irvine (2006) has proven Bayesian alphas are more accurate and persistent predictors of the performance of the mutual fund over the factor model regressions and passive asset returns that coincide with the fund returns, Grinblatt and Titman (1992), Hendricks, Patel, and Zeckhauser (1993), Goetzmann and Ibbotson (1994), Brown and Goetzmann (1995), Malkiel (1995), Elton, Gruber, and Blake (1996), and Gruber (1996). Yet, all of these studies use directly or indirectly the price as the main predictor of performance. But none of them gives us the extent to which price can reflect the performance.

There is evidence that Business connections can mitigate agency conflicts by facilitating efficient information transfers but can also be channels for inefficient favoritism. By analyzing these two effects in the mutual fund industry Kuhnen (2009) find that fund directors and advisory firms that manage the funds hire each other preferentially based on the intensity of their past interactions (Kuhnen, 2009).

Sirri & Tufano (1998) have shown in their paper the flows of funds into and out of equity mutual funds. Consumers base their fund purchase decisions on prior performance information but do so asymmetrically, investing disproportionately more in funds that performed very well in the prior period. Search costs seem to be an important determinant of fund flows. Chen, et al. (2008) investigated the directors' ownership in the mutual fund industry. They find that Ownership patterns are broadly consistent with an optimal contracting equilibrium. That is, ownership is positively and significantly correlated with most variables that are predicted to indicate greater value from directors' monitoring. This analysis is especially pertinent to our analysis as the mutual funds we have studied in this analysis are government controlled. Here again, the extent to which price reflects the past performance is not well defined.

Cumby & Glen (1990) by using the Jensen measure and the positive period weighting measure proposed by Grinblatt and Titman have found no evidence that the funds, either individually or as a whole, provide investors with the performance that surpasses that of a broad, international equity index over their sample period from 1982 to 88. Kothari & Warner (2001) have proved similar aspects of a mutual fund by using simulated funds. Their study has the deficiency in predicting something beyond their sample period and limitations of using price returns to reflect the performance of underlying assets.

Our study basically gets supported by the analysis done by Barras, et al., (2010). They developed a simple technique that controls for false discoveries or mutual funds that exhibit significant alphas by luck alone. Their approach precisely separates funds into (1) unskilled, (2) zero-alpha, and (3) skilled funds, even with dependencies in cross-fund estimated alphas. We find that 75% of funds exhibit zero alpha (net of expenses), consistent with the Berk and Green equilibrium. They designed a framework by which controlling for false discoveries substantially improves the ability to find the few funds with persistent performance. To show an underlying asset performance, Gaspar, et al. (2006) found that "high family value" funds (i.e., high fees or high past performers) overperform at the expense of "low value" funds. Such a performance gap is above the one existing between similar funds not affiliated with the same family. Better allocations of underpriced initial public offering deals and opposite trades across member funds partly explain why high-value funds overperform. Similarly, the relative performance of no-load, growth-oriented mutual funds persists in the near term, with the strongest evidence for a one-year evaluation horizon (Hendricks, et al., 1993).

Pollet & Wilson (2008) gave the strategy that if actively managed mutual funds suffer from diminishing returns to scale, funds should alter investment behavior as assets under management increase. The gap lies in the prescription when the fund is passively managed and the asset under management cannot easily be changed. Similar limitations are found in the analysis of Zheng (1999) as he finds evidence that funds that receive more money subsequently perform significantly better than those that lose money by using the active funds. This effect is short-lived and is largely but not completely explained by a strategy of betting on winners. In the aggregate, there is no significant evidence that funds that receive more money subsequently beat the market.

There is also evidence that fund managers inflate quarter-end portfolio prices with last-minute purchases of stocks already held (Carhart, et al., 2002). This analysis by proving that price can be manipulated no matter what the underlying performance is or how monthly return underperform daily return (Busse & Irvine, 2006), justifies our analysis on the reflection of price over the real performance of funds.

Recently, Choi, et al. (2016) have shown that investors learn about managers from their performance records. but their analysis is not really applicable to a developing country like Bangladesh. Here the performance record of fund managers is not published apart from the price of the mutual funds that they manage. The performance measures for the USA will not be applicable to all scenarios as the aggregate portfolio of actively managed U.S. equity mutual funds is close to the market portfolio which for Bangladesh is very low as a percentage (Fama & French, 2010).

Vikas and Agarwal (2015) have examined the impact of mandatory portfolio disclosure by mutual funds on stock liquidity and fund performance. They are among the first who have ignored the reflection power of mutual fund prices. They develop a model of informed trading with disclosure and test its predictions using the May 2004 SEC regulation requiring more frequent disclosure. Stocks with higher fund ownership, especially those held by more informed funds or subject to greater information asymmetry, experience larger increases in liquidity after the regulation change.

This is analysis is on the foundation laid by Daniel, et al. (1997). The article develops and applies new measures of portfolio performance which use benchmarks based on the characteristics of stocks held by the portfolios that are evaluated. the benchmarks are constructed from the returns of 125 passive portfolios that are matched with stocks held in the evaluated portfolio on the basis of the market capitalization, book-to-market, and prior-year return characteristics of those stocks. Based on these benchmarks, "Characteristic Timing" and "Characteristic Selectivity" measures are developed that detect, respectively, whether portfolio managers successfully time their portfolio weightings on these characteristics and whether managers can select stocks that outperform the average stock having the same characteristics.

The herding behavior of mutual fund is analyzed by Wermers (1999) but found little herding behavior of mutual funds. As later proven only in the incubation period the funds outperform the non-incubated funds and when they are opened to the public they attract higher flows (Evans, 2010) and funds hold stocks that outperform the market by 1.3 percent per year, but their net returns underperform by one percent and of the 2.3 percent difference between these results, 0.7 percent is due to the underperformance of nonstock holdings, whereas 1.6 percent is due to expenses and transactions costs (Wermers, 2000).

Guercio & Reuter (2014), to rationalize the well-known underperformance of the average actively managed mutual fund, they exploit the fact that retail funds in different market segments compete for different types of investors. But they do not show the impact of closed-end funds.

Similar analysis like ours is conducted by Lehmann & Modest (1987) and they tried to ascertain whether conventional measures of abnormal mutual fund performance are sensitive to the benchmark chosen to measure normal performance and we are trying to ascertain whether price can reflect the performance of the underlying asset of the government-controlled closed-end mutual fund.

In a study Falkenstein (1996) proves that mutual funds have a significant preference towards stocks with high visibility and low transaction costs and are averse to stocks with low idiosyncratic volatility. These add another dimension to our analysis by proving that price performance is not considered as an element in the function of underlying asset performance.

There are some other interesting and inconsistent puzzles regarding the performance of mutual funds as proven by (Gil-Bazo & Ruiz-Verd´U, 2009). They uncover another puzzling fact about the market for equity mutual funds: Funds with worse before-fee performance charge higher fees. Again, a hypothesis that denies the predictability of price in predicting performance.

None of the works of literature that have been studied captures the fact well enough to understand to which extent price can reflect the performance of the mutual fund. In this study, we have used the available data on the closed-end mutual funds controlled by a government-controlled institution of the period 2011 to 2017 and found out the return of the investment that the fund made over this period. What is published about these mutual funds are the closing price. We have considered both price return to see whether there exists any relationship between real return and price return. This fills in the gaps that the mentioned works of literature assume without any concrete proof.

3 Methodology

3.1 Theoretical Framework

Let M_i is a closed-end mutual fund. This fund will be invested in a smaller portion, w_i, to s_i securities. Therefore, the total value of the fund will be

$$V = \sum w_i s_i \tag{1}$$

Considering the objectives of mutual funds, the fund manager tries to increase V considering the risk profile of the investment.

We can define the price of each unit of mutual funds is as follows:

$$P = \frac{V}{N} = \frac{\sum w_i s_i}{N} \tag{2}$$

Where N is the number of shares that the mutual fund will be divided into. From the above two equations we can infer the following aspects:

- The increase in the value of the fund is a function of weight and securities. Therefore, changes in the weights and securities should bring instantaneous changes in the price movements and price returns.
- Thus, changes in the value will bring changes in its price. Increase in the value should increase the price as well or the vice-versa.
- Therefore, their movement in the market should be identical with the performance of their underlying assets.

Therefore, we can write the following equations:

$$\frac{\Delta P}{P_o} = \frac{\Delta V}{V_o} \tag{3}$$

In equation 3, $\frac{\Delta P}{P_o}$ and $\frac{\Delta V}{V_o}$ are the price return and the value return respectively.

We can form the above relationship with the following regression equation:

$$y_{it} = \alpha + \beta x_{it} \tag{4}$$

Where, y_i is the value return ($\frac{\Delta V}{V_o}$) and x_i is the price return. Here we can easily test and determine the value of β. If the value of β is 1, we can say equation 3 is true and declare that price returns reflects the value returns. But if the value of β is close to 0 or negative, we declare price returns does not reflect the value returns.

3.2 Data

We have collected data mainly from two sources. One is published public data and the other is somewhat confidential data from ICB.

The published dataset included the daily NAV and the closing price of all the mutual fund in Dhaka Stock Exchange. From that long data set, we have taken data of five major mutual fund that are controlled by ICB. As we are trying to find the explanatory power of government-controlled mutual funds' closing price in explaining the value return, these five mutual funds have served our purpose in terms of both time and variability. Following two graphs give us an idea about the movement of both underlying asset returns and price over last seven years:

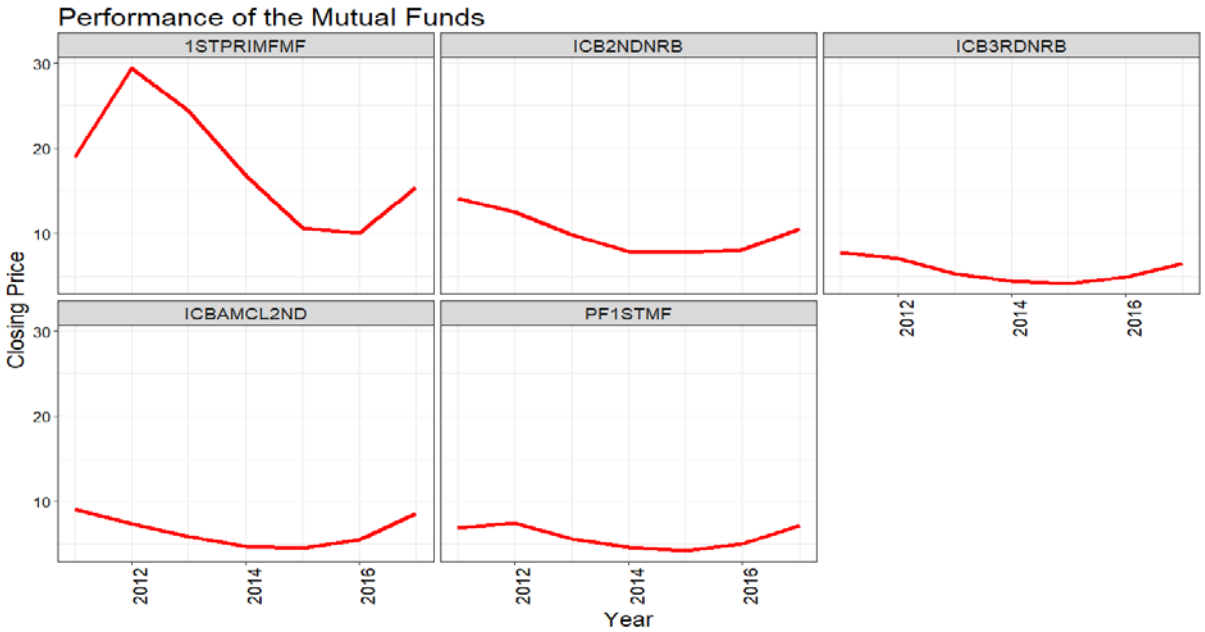

Figure 1: Closing Price (2011-2017)

In figure 1, the closing prices show a similar trend except for 1STPRIMFMF where the volatility is higher. In the period 2013-2015, the price was well below the face value. Theoretically, this should prove the underperformance of the underlying investments during that period. Currently, the price trend is upward. One of the plausible causes of this upward trend is that the fund is approaching towards its liquidation point.

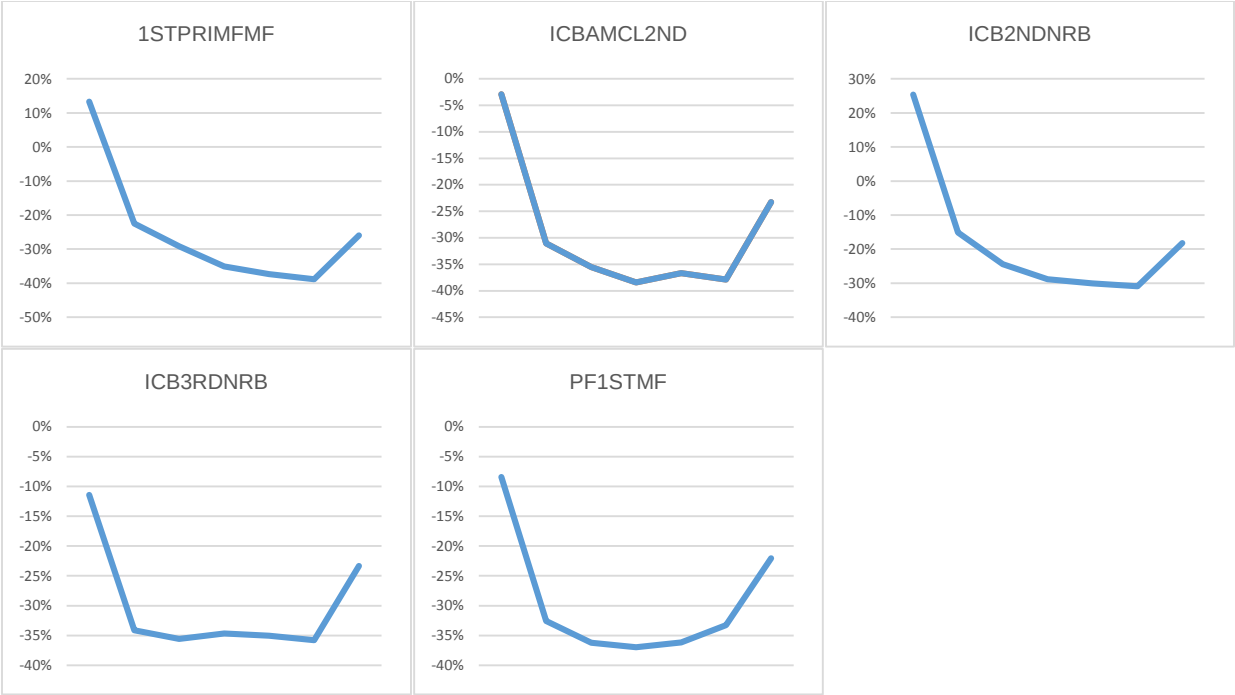

Figure 2: Underlying Asset Returns (2011-2017)

In the above figure, we find the return behavior of underlying securities of each mutual fund. The return in 2013-2015 is negative which is consistent with the price lower than the face value of each share. Interestingly, in 2016 and later the return of securities of every mutual fund is increasing. This can also trigger the upward trend in the closing price.

From these figures, we get a cursory idea of the relationship of the price of mutual fund and the return of underlying securities.

The confidential dataset included the investment of each of the mutual funds that ICB controls. The investment was given in terms of securities in the market. For example, let mutual fund x has an investment in 40 securities and in that dataset, each portion of the investment in those 40 securities by mutual fund x is given. The year-end investment was given from the year 2011. From that data set, we have extracted the information of our targeted five mutual funds and got year-end values of cost price and the market price of respective securities. Once we have got these data, it was easy for us to calculate the return and create a panel with the combination of returns and years of 5 selected securities. We can explain our data in the following table:

Table 1: Data Summary

Variable		Mean	Std. Dev.	Min	Max	Observations	
MF	overall	3	1.43486	1	5	N =	35
	between		1.581139	1	5	n =	5
	within		0	3	3	T =	7
Year	overall	2014	2.029199	2011	2017	N =	35
	between		0	2014	2014	n =	5
	within		2.029199	2011	2017	T =	7
Return	overall	-.2626278	.1460787	-.3882212	.2537771	N =	35
	between		.0529974	-.299968	-.1746106	n =	5
	within		.1379345	-.400052	.1657599	T =	7
Close ~e	overall	9.203503	5.786536	4.113636	29.42632	N =	35
	between		5.203594	5.683076	17.94711	n =	5
	within		3.344394	1.251135	20.68271	T =	7
NAV	overall	9.563386	2.269492	6.28	15.71	N =	35
	between		2.117611	7.605857	12.10943	n =	5
	within		1.207336	7.753957	13.16396	T =	7

In the above table, we see in the dependent and independent variables we have between and within variation. This allows us to use Pooled OLS model to find the estimator. In the next section, we show the relevant tests on the basis of which we have selected our estimator. As we have 7 years of data, to test the unit root problem of our data set, we have conducted Dickey-Fuller test and found our data are free of non-stationary problems.

4 Analysis and Results

At the first step of our analysis, we have run the test for deciding on which panel data model we should use. We have run Hausman Test and Breusch-Pagan LM test for deciding on the models. As our dataset has both within and between variations, there is no individual specific correlation among the mutual funds. This allows us to use Pooled OLS estimator to find the individual co-efficient ignoring both fixed and random variations. To make our argument more rigorous we have run Hausman test to decide on the applicability of fixed and random effect model. The summary of the test is as follows:

Table 2: Result of Hausman Test

	Coefficients (b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
Close_price	.0197264	.0103271	.0093992	.0052007

```
                b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test:  Ho:  difference in coefficients not systematic

              chi2(1) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                      =        3.27
            Prob>chi2 =      0.0707
```

As the probability from chi-square distribution is not significant at 95% level, we cannot use the fixed effect model. Then we run Breusch-Pagan LM test to decide between the individual-specific effect model and pooled OLS model. The output of the test is as follows:

Table 3: Results of Breusch-Pagan LM Test

```
Breusch and Pagan Lagrangian multiplier test for random effects

        Return[MF,t] = Xb + u[MF] + e[MF,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                ---------+-----------------------------
                  Return |   .021339       .1460787
                       e |  .0172034       .1311618
                       u |  .0005155       .0227049

        Test:   Var(u) = 0
                             chibar2(01) =      0.02
                          Prob > chibar2 =    0.4484
```

Here also we get an insignificant chi-square value proving that we can use pooled OLS estimator to test on the explaining ability of our dependent variable by independent variable. On the basis of this result, we have conducted our panel data analysis with Pooled OLS models.
Using the Pooled OLS estimator, we have run the regression and found the following results:

Table 4: Results of Pooled-OLS Regression

Source	SS	df	MS
Model	.106423924	1	.106423924
Residual	.61910139	33	.018760648
Total	.725525313	34	.02133898

Number of obs =	35
F(1, 33) =	5.67
Prob > F =	0.0232
R-squared =	0.1467
Adj R-squared =	0.1208
Root MSE =	.13697

Return	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Close price	.0096686	.0040594	2.38	0.023	.0014096	.0179275
_cons	-.3516124	.043953	-8.00	0.000	-.4410354	-.2621893

From the F-test and T-test we see, we have got a significant model and co-efficient.

In the theoretical framework we have stated our fundamental regression equation:

$$y_{it} = \alpha + \beta x_{it} \quad (4)$$

According to our analysis, if the value of β is close to 1, the hypothesis that price can reflect the performance of the mutual funds. If the value of β is close to 0, the hypothesis that price cannot reflect the performance of the mutual funds.

From our Pooled OLS regression analysis we find the value of β is 0.00967 and this is close to zero. This proves that price cannot reflect the changes in real return for our dataset. The value of the adjusted R-value proves that prices have little explanatory power to explain the changes in the real return of the underlying asset.

From table 2 we see, the p-value (.0707) is close to .05. Hence, we also run the regression under fixed-effect model to see whether the result is consistent with the results we found in table 4.

Table 5: Results of Regression under Fixed Effects Model.

```
Fixed-effects (within) regression               Number of obs      =        35
Group variable:  MF                                Number of groups   =         5

R-sq:  within  =  0.2288                           Obs per group: min =         7
       between =  0.2061                                          avg =       7.0
       overall =  0.1467                                          max =         7

                                                   F(1,29)            =      8.60
corr(u_i, Xb)  =  -0.6995                          Prob > F           =    0.0065
```

Return	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Close price	.0197264	.0067259	2.93	0.006	.0059704	.0334824
_cons	-.4441796	.0657523	-6.76	0.000	-.5786581	-.309701
sigma_u	.09168427					
sigma_e	.13116181					
rho	.32823873	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(  4, 29) =      1.75                 Prob > F =  0.1668
```

The results under fixed effects model are consistent with what we have found under pooled-OLS regression model. The coefficient of close price is 0.091 which is also close to 0 rather than 1 and similar to what pooled-OLS regression model showed. The overall r-squared is also only 0.1467 similar to 0.1208 under the pooled-OLS model.

The rho value of 0.3282 under fixed effects model proves the variation in underlying securities return is explained by idiosyncratic variation to some extent.

4.1 Implication of the results

1. The analysis proves that in Bangladesh, prices of the closed-end mutual fund managed by government-controlled asset manager do not reflect the performance of the underlying securities or assets.
2. Therefore, whatever performance the asset manager shows in managing the mutual funds is not reflected in the prices. This also violates the weak market hypothesis that stock price should reflect the published and available information regarding the performance of stocks.
3. This also indicates if there is any incentive or any other compensation provided to the asset managers which impacts the performance as proven by earlier studies (Reuter, 2006; Eltonm, et al., 2003; Brown, et al., 1996; Carhart, 1997) will not be reflected in the prices of these mutual funds.
4. So, the investors remain in blindsight regarding whether the fund is performing well or not by seeing the prices. To help them make an educated decision, there must be some kind of index or other indicators by which at least they can understand how their mutual fund is moving with respect to the market. In this way, they will be independent of the prices and take investment decision knowing their adopted risk level.

5 Conclusion and Scope of Further Studies

Our analysis leaves a clear indication that in Bangladesh the prices of the mutual fund overlooked by the government-controlled asset manager cannot reflect the yearly performance of the underlying assets or securities. Hence, the result earlier analysis done on the benchmarks related with the prices mutual funds (Brown & Goetzmann, 1995; Brown, et al., 1996; Eltonm, et al., 2003; Fama & French, 2010; Grinblatt & Titman, 1992; Grinblatt & Titman, 1992; Lee & A. J. Lerrot, 1973) cannot be applied to the government-controlled closed-end mutual fund, evidenced by Bangladeshi market. Here for the data limitations, only yearly return of the underlying securities is considered. We have taken the price return average for the last month of the year to normalize the data to some extent.

We can take this analysis as a benchmark for the mutual fund of other developing countries where the funds are managed by the government-controlled asset manager. As price cannot reflect the performance of those mutual funds, the investors cannot take informative investment decision in this regard. Here, we can work on innovating some index which would at least give the investors the indication regarding the movement of the underlying securities with respect to the market. Therefore, if the investors want to go against or with the market, they can do it by investing in the mutual funds.

The scope of our analysis can be broadened to include all the closed-end mutual fund of the market controlled by both government controlled and private asset managers. With that analysis, the reflection power of the prices of closed-end mutual funds can be established for any capital market.

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