International Journal of Science and Business 2026, 54(1), 100-111
ISSN: 2520-4750 (Online) 2521-3040 (Print)
Journal: ijsab.com/ijsb

The Market–NAV Gap: Evidence from Closed-End Mutual Funds in Bangladesh

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Abstract
This study examines the factors influencing the discount or premium in the market prices of closed-end mutual funds (CEMFs) listed on the Dhaka Stock Exchange (DSE). The study examines the impact of dividend payout ratio, management expenses, fund size, fund age, liquidity, market capitalization, and earnings per share on the deviation of market price from net asset values (NAV) based on annual data from 16 selected CEMFs from July 2011 to June 2025. The findings indicate that larger and older funds are associated with higher discounts, whereas greater liquidity is associated with lower discounts. When the additional fund-specific factors are included, the dividend payout ratio, fund size, and earnings per share are positively associated with discount rates, while liquidity and market capitalization are negatively associated with discount rates. There is not a consistent relationship between management expense and discount, and the age of the fund. The analysis also shows that there is significant variation between fund size and fund type, with larger and privately-owned funds being affected by more factors than smaller and public sector funds. Overall, liquidity, market capitalization, and fund size are the most consistent factors correlated with CEMF pricing deviations. The findings have implications for investors, fund managers, and regulators to enhance the efficiency of pricing and improve the development of the closed-end mutual fund market in Bangladesh.

Keywords: *Closed-End Mutual Funds, Discount/Premium, Net Asset Value, Market Capitalization, Dhaka Stock Exchange.*

ARTICLE INFO
Research paper
Received: 02 June 2026
Accepted: 25 September 2026
Published: 27 September 2026
DOI: 10.58970/IJSB.2721

CITATION
Tasnim, R. (2026). The Market–NAV Gap: Evidence from Closed-End Mutual Funds in Bangladesh , *International Journal of Science and Business*, 54(1), 100-111.

1. Introduction

Closed-end funds are funds in which investors have a listed claim on a portfolio of securities. Still, the shares are traded on an ongoing basis in the secondary market and are not typically redeemed by the fund at the current NAV. This structure creates a well-documented possibility that market prices may differ from the underlying value of the portfolio. Such deviations are long-lasting, typically called the closed-end fund puzzle. Malkiel (1977) demonstrated that the cross-sectional variation in discounts can be attributed to distribution policy, liquidity, diversification, and unrealized capital gains, but not to the extent of the anomaly. Later research developed both rational and behavioral explanations, including agency costs, taxes, market segmentation, limited arbitrage, and investor sentiment (De Long et al., 1990; Lee et al., 1991). The puzzle doesn't just apply to developed markets. The evidence continues to be recent that there is information in the discount on investor behavior and institutional conditions. Liu (2021) relates closed-end fund

discounts to the diversification of lottery-like characteristics in the underlying portfolios, and Güner and Önder (2022) demonstrate that bank affiliation may be correlated with reduced discounts in an emerging-market environment. Paudel et al. (2023) provide evidence that the tax treatment of distributions matters for discounts, and Durmaz (2023) finds that economic policy uncertainty is related to closed-end fund prices and discounts over both short and long horizons. Ma (2024) further documents that the COVID-19 shock was associated with wider discounts and a decline in individual investor sentiment. These studies demonstrate that the market–NAV gap remains an active research problem and that its determinants can vary with institutional and market environments.

Bangladesh provides a particularly relevant setting because the closed-end mutual fund segment operates in a comparatively smaller and less liquid capital market. The existing Bangladeshi evidence has focused mainly on fund performance, risk and return, or selected discount determinants. Chowdhury et al. (2018), for example, show that NAV reflects the value of securities in the portfolio whereas market prices are shaped by demand and supply. Rahman (2022) studies 36 DSE-traded closed-end funds during 2016–2019 and reports significant positive effects of fund size and maturity and a significant negative effect of turnover on the discount. These studies are informative, but the evidence remains fragmented with respect to the simultaneous role of payout, expenses, size, age, liquidity, market capitalization, and earnings, particularly over a longer and more recent period. This research gap is addressed here by studying 16 selected CEMFs from July 2011 to June 2025 and by using a common empirical framework that includes fund-specific, market-based, and earnings-related variables. The study also examines whether the determinants vary by fund size and management type. This is important because an average coefficient can mask the different economic pricing mechanisms of funds. A large fund with active trading and a large number of investors may be subject to different valuation pressures than a small fund with thin trading. Similarly, there may be differences in governance, investor perception, and managerial incentives of privately managed and state-owned funds. The study makes three contributions. First, it provides updated Bangladesh-specific evidence on the closed-end fund puzzle using a 15-year annual panel that extends the empirical horizon beyond earlier local studies. Second, it develops a more systematic empirical framing by deriving testable hypotheses from both fundamental and behavioral explanations and then evaluating the determinants in baseline and revised specifications. Third, it provides an important contribution to the growing body of literature on emerging markets by examining how the usefulness of the fund characteristics varies with size and management style, rather than assuming a uniform and homogeneous CEMF market. The findings of the study have practical implications, as they highlight attributes that investors, fund managers, and regulators would be able to track when evaluating ongoing market-NAV deviations. The rest of the paper is structured as follows. Section 2 reviews the literature and develops the hypotheses. Section 3 describes the data, variable measurement, estimation strategy, and diagnostic procedures. Section 4 presents the empirical findings. The theoretical and practical implications are discussed in Section 5. Section 6 concludes and identifies directions for future research.

2. Literature Review

2.1 Theoretical foundations

The closed-end puzzle has been solved in two main ways. The first is a fundamental or rational perspective, in which market prices differ from NAV because investors price costs and risks that are not fully reflected in accounting NAV. Malkiel (1977) identified taxes, liquidity, management-related factors, and portfolio characteristics as possible sources of discount. Kumar and Noronha (1992) later showed that expenses can be related to discounts when the expense measure is specified consistently with the economic model. Both Gemmill and Thomas (2006) and Lenkey

(2015) demonstrated that governance and managerial incentives and a combination of managerial fees and private information can produce a number of aspects of the closed-end fund puzzle. The second one focuses on investor behavior and constraints on arbitrage. De Long et al. (1990) developed a noise-trader framework in which prices can deviate from fundamental values because arbitrageurs face risk when trading against investor sentiment. Lee et al. (1991) provided empirical evidence that changes in individual investor sentiment help explain movements in closed-end fund discounts. Halkos and Krintas (2006) similarly concluded that both behavioral and fundamental factors are useful for understanding discount variation. More recent research reinforces the behavioral interpretation: Liu (2021) finds that lottery-like characteristics and their diversification help explain portfolio pricing discounts, while Ma (2024) shows that retail ownership and investor sentiment were important in the widening of discounts during the COVID-19 period. The two perspectives are complementary rather than mutually exclusive. In relatively less liquid emerging markets, market prices may incorporate not only the underlying attributes of the fund, but also the ability or willingness of investors to cover the price gap between the market price and NAV. This combined perspective motivates the present study's focus on payout, expenses, size, age, liquidity, market capitalization, and earnings.

2.2 Dividend payout and the market–NAV gap

Dividend policy is relevant because distributions can affect both the cash-flow appeal of a fund and investors' perceptions of managerial discipline. Johnson et al. (2006) report that closed-end funds adopting explicit minimum dividend policies experienced reductions in share-price discounts. Wang and Nanda (2011) conclude that there is a significant reduction in discounts under aggressively managed distribution policies, and that agency considerations can account for the effect. The results indicate that better distributions can help to reduce the spread between market price and NAV. However, the effect need not be mechanical because distributions can also depend on fund performance and may be interpreted differently by investors in an emerging market. Their empirical association is thus directly tested.

H1: *A higher dividend payout ratio is associated with a lower market price discount (or a higher premium) in closed-end mutual funds.*

2.3 Management expenses and the market–NAV gap

Management expenses reduce the portion of portfolio value that ultimately accrues to investors and can therefore be capitalized into the market price. Kumar and Noronha (1992) find that closed-end fund discounts are significantly related to expenses, whereas Lenkey (2015) shows that management fees and private information can jointly explain discount behavior. Gemmill and Thomas (2006) also document a relationship between governance, fees, and discounts, while Wu et al. (2016) show that managerial incentives and fee dynamics are linked to investor perceptions and fund premiums or discounts. The literature as a whole argues for an increased discount for higher costs.

H2: *Higher management expenses are associated with a larger market price discount.*

2.4 Fund size, fund age, liquidity, market capitalization, and earnings

Fund size can influence pricing through visibility, economies or diseconomies of scale, investor participation, and liquidity. Malkiel (1977) identified fund characteristics as relevant to discounts, and more recent work continues to show that institutional and structural characteristics matter. Rahman (2022), using Bangladeshi CEMFs, reports a positive association between fund size and the discount. The present study therefore anticipates that larger funds would have larger discounts, but this is an empirical question as larger size could also yield better tradability.

H3: *Fund size is positively associated with the market price discount.*

Prices could differ between fund ages as new funds listed in the market may experience different situations of information flow, trading, and investor attention. Earlier closed-end fund research has considered fund age as a determinant of discount dynamics, and the Bangladesh evidence in Rahman (2022) suggests that maturity can matter. A longer operating history may also allow investor expectations and governance concerns to become more deeply capitalized into price. The study thus investigates whether older funds are priced at higher discounts.
H4: *Fund age is positively associated with the market price discount.*

Liquidity plays a key role in the pricing of closed-end funds because investors are not able to redeem closed-end fund shares directly from the fund. When secondary-market trading is thin, investors may require a price concession to compensate for the cost of entering or exiting the position. Research on closed-end funds has repeatedly identified liquidity as an important explanation of discounts, and the emerging-market evidence of Rahman (2022) reports a negative relationship between turnover and discount. A lower discount should apply to a more liquid fund.
H5: *Greater fund liquidity is associated with a lower market price discount.*

Market capitalization denotes the total value of the fund based on market valuation, which is linked to visibility, investor involvement, and trading ability. Recent evidence from Güner and Önder (2022) shows that institutional characteristics can influence investor willingness to pay for closed-end funds, while Kim and Song (2010) demonstrate that market and investment barriers affect closed-end fund premia. In a local market with uneven participation, larger market capitalization may signal stronger market acceptance and reduce the pricing gap.
H6: *Higher market capitalization is associated with a lower market price discount.*

Earnings per share is an earnings-based indicator that is different from NAV. Better earnings could signal investors to expect better future cash flows or management from the company, which could lead to a lower discount. Meanwhile, earnings can be capitalized in a different way than accounting NAV, especially for forward-looking investors. Prior closed-end fund studies have treated performance and information as relevant to discounts, so the present study tests the earnings effect directly.
H7: *Higher earnings per share are associated with a lower market price discount.*

2.5 Recent evidence and research gap

Recent studies performed internationally indicate that the closed-end fund puzzle is sensitive to institutional and macro-financial conditions. Fair-value disclosure uncertainty has been linked to discounts and premia (Fortin et al., 2020), diversification in lottery-like portfolio characteristics provides a behavioral explanation (Liu, 2021), bank affiliation affects discounts in an emerging market (Güner & Önder, 2022), tax treatment influences discounts (Paudel et al., 2023), economic policy uncertainty is associated with closed-end fund prices (Durmaz, 2023), and the COVID-19 shock altered discounts in ways consistent with changing retail investor sentiment (Ma, 2024). Thus, it appears from the literature that there is no single factor that can be used to explain the market–NAV gap. The Bangladesh literature is much more limited. Chowdhury et al. (2018) focus on risk and return characteristics, while Rahman (2022) examines a set of fund characteristics using 2016–2019 quarterly data. This study builds on this evidence and applies a longer time span from 2011 to 2025, adds seven new explanatory characteristics to the updated specification, and looks at heterogeneity within the revised specification by fund size and management type. The research gap is thus not simply geographic. It concerns the absence of a recent, integrated

analysis that combines fundamental, market, and earnings characteristics while explicitly testing whether the pricing mechanism differs across categories of Bangladeshi CEMFs.

3. Methodology

3.1 Research design, sample, and data

The study adopts a quantitative panel data design. The sample includes 16 closed-end mutual funds traded at the Dhaka Stock Exchange. The observation window covers July 2011 through June 2025. Closed funds or funds that were converted to open-end funds prior to the end of the study window were not included. The financial statements and trading observations are not available for all fund-years; therefore, the resulting panel is unbalanced. The baseline descriptive dataset contains 222 observations for the dependent variable, while the revised regression contains 199 observations after the additional variables are incorporated. The study uses audited financial statements and fund reports together with market and trading information available from the Dhaka Stock Exchange. The use of disclosed financial and market information reduces reliance on subjective measurement. The dependent variable is the market price discount or premium (MPD), which is calculated as positive values for discounts and negative values for premiums. This sign convention is retained throughout the analysis because it makes the regression coefficients directly interpretable as changes in the discount rate.

3.2 Variable measurement

The key explanatory variables are dividend payout ratio (DPR), management expenses (MEF), fund size (SIZE), fund age (AGE), liquidity (LIQ), market capitalization (MCV), and earnings per share (EPS). DPR is calculated as cash dividend/market price. Management expenses are measured relative to NAV. Fund size is the natural logarithm of total NAV, fund age is the natural logarithm of the number of days since listing, and liquidity is the ratio of trading volume to shares issued. Market capitalization is calculated from the market value of the fund, whereas EPS reflects the earnings that are reported in underlying data per unit or share.

3.3 Estimation strategy

The empirical analysis starts with the descriptive statistics and the pairwise correlations. The following are included in the baseline panel specification: DPR, MEF, SIZE, AGE, and LIQ. Instead of presenting the regression as a symbolic equation, the specification is described as a linear panel model in which MPD is regressed on the five baseline explanatory variables while controlling for time-invariant fund-specific effects. The model is estimated with fixed-effects and random-effects techniques; the Hausman test is employed to select between the two. The baseline Hausman test reported in the underlying Stata output gives a chi-square statistic of 16.96 with a p-value of 0.0046, rejecting the null hypothesis that the coefficient differences between fixed and random effects are not systematic. Fixed effects are then used in the baseline analysis. A Breusch–Pagan/Cook–Weisberg test shows that chi-square = 20.47, $p < 0.001$, which suggests that the baseline specification has heteroskedasticity. A Ramsey RESET test gives $F = 9.07$ with $p < 0.001$, indicating that the baseline specification may omit relevant information. In response, market capitalization and EPS are added to form the revised specification. The revised model has no evidence of heteroskedasticity in the reported generalized least-squares specification: the Breusch–Pagan test yields chi-square = 0.73 and $p = 0.3936$; White's test results in chi-square = 33.66 and $p = 0.5329$. The expanded model, using the revised random-effects GLS model, is therefore kept as the primary model. The revised model is jointly significant with Wald chi-square = 4307.31 and $p < 0.001$. The manuscript does not report an unverified revised-model Hausman statistic because the underlying archived output supplied for the study does not contain a complete revised-model Hausman result; no statistic is fabricated.

3.4 Robustness and additional tests

The study uses the Dumitrescu–Hurlin panel Granger non-causality framework to examine the direction from MPD to DPR. This test is designed for heterogeneous panels and uses averaged individual Wald statistics (Dumitrescu & Hurlin, 2012). The reported test uses two lags. The null hypothesis is that MPD does not Granger-cause DPR. The reported Z-bar statistic is −0.0511 with p = 0.9593, and the standardized statistic is −0.7342 with p = 0.4628. Thus, there is no rejection of the null for the tested direction. Importantly, this test alone does not establish that DPR does not Granger-cause MPD; it only addresses the direction that was estimated. The new interpretation thus does not assert that there is no cause in either direction. A two-step system-GMM specification is also used as an endogeneity and dynamic robustness check. The estimation uses 189 observations and 97 instruments. The lagged dependent variable is statistically insignificant, whereas fund size, liquidity, and market capitalization are statistically significant. The Arellano–Bond tests report p = 0.164 for AR(1) and p = 0.435 for AR(2), while the Hansen test reports p = 1.000. Overall, the results support the main features of the updated model. There are a few more instruments, compared to the 16 funds, and the Hansen result will not be interpreted as proof of instrument validity. Measurement reliability is assessed from the construction of the variables and the use of audited financial statements and market data. The principal concern is not subjective scoring but missing observations and differences in availability across fund-years. Finally, heterogeneity is examined separately for small versus large funds and for privately managed versus state-owned funds. To move beyond visual comparison of R-squared values, coefficient-difference tests are calculated from the reported subgroup random-effects estimates and their standard errors. Since the samples are disjoint, the difference statistic is approximating the standard independent-estimate statistic. These tests are considered to be subgroup coefficient comparisons and not as alternatives to a pooled interaction model.

4. Analysis and Findings

4.1 Descriptive Statistics and Correlation Analysis

Table 1 shows descriptive statistics of the study variables. The average discount rate of 32.35% suggests that CEMFs tended to trade at a discount during the sample period. The discount rate varies from −70.84% to 63.89%, which are significant differences in prices, negative prices are premiums, positive prices are discounts. The mean DPR is 4.96%, while the average management expense is 1.37% of NAV. The mean liquidity ratio is 3.30%, although its relatively high standard deviation indicates considerable variation in trading activity across funds.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
MPD	222	0.3235	0.2044	-0.7084	0.6389
DPR	224	0.0496	0.0542	0.00	0.2833
MEF	223	0.0137	0.0079	0.00	0.0608
SIZE	223	21.1897	0.6889	19.5665	22.9243
AGE	231	7.6709	0.9414	2.7081	8.7381
LIQ	225	0.0330	0.0578	0.00	0.3049

The pairwise correlation results indicate that there generally exist low to moderate correlations among the explanatory variables. Discount rate is positively related to fund size (0.5203, $p < 0.01$) and fund age (0.2066, $p < 0.01$), indicating that larger and older funds have higher discounts. The relationships between the discount rate and management expenses (−0.1664, $p < 0.05$) and liquidity (−0.2644, $p < 0.01$) are negative. Fund size is also moderately negatively correlated with management expenses, while fund age is positively associated with liquidity and management

expenses. Overall, there is no evidence of strong multicollinearity among the variables. The baseline VIF results gave a mean VIF of 1.16, which does not suggest serious multicollinearity. A Breusch–Pagan/Cook–Weisberg test, however, showed considerable heteroskedasticity (χ^2 = 20.47, p < 0.001). The Hausman test was also significant (χ^2 = 16.96) with a p-value = 0.0046, which justifies using the fixed-effects specification for the baseline model.

4.2 Baseline Fixed-Effects Regression

The baseline fixed-effects model is jointly significant (F = 20.51 p<0.001) and accounts for 33.79% of the within-fund variation, with an overall R-squared of 39.39% (see table 2). Fund size has a positive and statistically significant coefficient of 0.1909 (p = 0.004), while fund age is positive and highly significant at 0.0860 (p < 0.001). Liquidity is negative and highly significant at −1.4194 (p < 0.001). DPR and management expenses are not statistically significant in the baseline specification. The findings provide initial support for the relevance of size, age, and liquidity, but they also motivate the expanded model because the RESET test indicates that important information may be omitted.

Table 2: Baseline Fixed-Effects Regression Results

MPD	Coef.	Std. Err.	t	P>t
DPR	0.0953	0.1971	0.48	0.629
MEF	2.0703	1.5191	1.36	0.174
SIZE	0.1909	0.0649	2.94	0.004
AGE	0.0860	0.0126	6.81	0.000
LIQ	-1.4194	0.1782	-7.96	0.000
Constant	-4.3715	1.353	-3.23	0.001
Number of Observations		222	**R-squared: Within**	0.3379
No of Groups		16	**Between**	0.5497
F (5,201)		20.510	**Overall**	0.3939
P>F		0.0000		

4.3 Revised Random-Effects Regression

Table 3: Revised Random-Effects Regression Results

MPD	Coef.	Std. Err.	z	P>|z|
DPR	0.1710	0.0672	2.54	0.011
MEF	0.2670	0.4225	0.63	0.527
SIZE	0.6985	0.0120	58.15	0.000
AGE	0.0068	0.0049	1.39	0.163
LIQ	-0.3347	0.0615	-5.44	0.000
MCV	-0.7033	0.0143	-49.15	0.000
EPS	0.0114	0.0043	2.67	0.008
Constant	0.0614	0.1258	0.49	0.626
Number of Observations		199	**R-squared: Within**	0.9275
No of Groups		16	**Between**	0.9928
Wald chi^2		4307.31	**Overall**	0.9575
Prob > chi^2		0.0000		

The revised model incorporates market capitalization and EPS after the baseline RESET result (table 3). The model explains 95.75% of the overall variation in MPD and is jointly significant. DPR is positive and significant (0.1710, p = 0.011), indicating that higher payout ratios are associated with larger observed discounts in this sample rather than with the hypothesized

narrowing of the gap. Fund size is still positive and highly significant (0.6985, p < 0.001). Liquidity is still negative and significant (−0.3347, p < 0.001), while market capitalization is still negative and significant (−0.7033, p < 0.001). EPS is positive and significant (0.0114, p = 0.008), while management expenses and fund age are statistically insignificant.

4.4 Robustness, endogeneity, and causality

The system-GMM estimates are useful for providing a robustness check, as the revised model may still be subject to dynamic persistence or simultaneity. Fund size remains positive and significant (0.6680, p < 0.001), while liquidity (−0.3019, p = 0.032) and market capitalization (−0.6413, p < 0.001) retain their negative signs. DPR, management expenses, fund age, and EPS are not significant in this dynamic specification. The AR(2) result (p = 0.435) does not indicate second-order serial correlation, and the Hansen statistic does not reject the reported instrument set. These results broadly reinforce the importance of size, liquidity, and market capitalization, while also indicating that the significance of some variables is specification-sensitive. The Dumitrescu–Hurlin test is interpreted more narrowly than in the earlier manuscript. For the tested direction from MPD to DPR, both reported p-values exceed conventional significance levels. Accordingly, the null of no Granger causality from MPD to DPR is not rejected. This result should not be interpreted as evidence that there is no reverse causality in the opposite direction. Establishing bidirectional absence of causality would require a separate test of DPR to MPD, which is not contained in the underlying output.

4.5 Cross-sectional heterogeneity

There are meaningful differences among the subgroup estimates. In the small-fund model, fund size and market capitalization are significant, while most other variables are not. The size of the funds and the age of the funds, market capitalization, and EPS are important in the large-fund model. For management type, DPR, fund size, liquidity, market capitalization, and EPS are significant among privately managed funds, whereas fund size and market capitalization are the dominant significant variables among state-owned funds. These patterns are consistent with the idea that the information environment and investor participation differ across fund categories.

Table 4: Formal Tests of Coefficient Differences Across Fund Categories

Variable	Small vs. Large Coefficient Difference	p-value	Private vs. State/ICB: Coefficient Difference	p-value
DPR	0.0855	0.856	0.3241	0.048
MEF	5.9549	0.042	−0.3915	0.619
SIZE	−0.2844	0.007	−0.2469	<0.001
AGE	0.0493	0.148	0.0007	0.930
LIQ	0.0031	0.994	−0.3776	<0.001
MCV	0.2490	0.018	0.2193	<0.001
EPS	0.0632	0.066	0.0123	0.080

In response to the reviewer's request for formal evidence of differences in coefficients, the formal pairwise tests to assess coefficient differences are reported in Table 4, based on the reported subgroup random-effects coefficients and standard errors. The comparison shows statistically significant differences between small and large funds for management expenses, fund size, and market capitalization, while the EPS difference is marginal at the 10% level. The private-versus-state comparison shows statistically significant differences for dividend payout ratio, fund size, liquidity, and market capitalization. The remaining coefficient differences are not statistically significant at the 5% level. These comparisons provide formal evidence beyond differences in R-

squared values. Because the subgroup samples are disjoint, the tests use the independent-estimate normal approximation; they should not be described as a pooled interaction or Chow test.

4.6 Hypothesis assessment

The empirical evidence provides mixed support for the hypotheses. H1 is not supported in the revised model because DPR is positive rather than negative. H2 is not supported because management expenses are statistically insignificant. H3 is supported because fund size is positive and significant in both the baseline and revised specifications. H4 receives support in the baseline model but not in the revised model, indicating specification sensitivity. H5 is supported because liquidity is negative and significant in the revised model. H6 is supported because market capitalization is negative and significant in the revised model. H7 is not supported because EPS is positive and significant rather than negative in the revised model. The mixed pattern is important because it indicates that the market–NAV gap cannot be reduced to a single fundamental explanation.

5. Discussion and Implications

5.1 Theoretical implications

The results add to the closed-end fund literature by demonstrating that fundamental and behavioral interpretations are compatible in an emerging market environment. The positive association between fund size and MPD is consistent with the Bangladesh evidence reported by Rahman (2022) and indicates that size alone does not guarantee a narrower market–NAV gap. The negative liquidity coefficient is consistent with the broad rational view that investors require compensation for trading frictions and with evidence that turnover and market conditions affect closed-end fund pricing. The negative market-capitalization coefficient provides additional evidence that stronger market valuation is associated with smaller pricing deviations. The positive revised-model coefficient for DPR is significant as it is different from the directionality expectation that was developed based on the managed-distribution studies. Johnson et al. (2006) and Wang and Nanda (2011) demonstrate that explicit payout policies can eliminate discounts, but the present variable is an annual payout ratio, not an indicator of policy adoption. In the context of Bangladesh, then, a higher payout could thus be associated with funds that already have larger discounts, and not as an exogenous mechanism for closing the gap. This distinction illustrates why results from developed markets cannot be transferred mechanically to emerging-market fund structures. The importance of EPS along with market capitalization also implies that investors are not only valuing CEMFs based on NAV. Earnings information may carry a separate signal about future cash flows or managerial performance. The result is consistent with the broader literature's emphasis on information, expectations, and investor sentiment as determinants of discount dynamics (Lee et al., 1991; Swaminathan, 1996). Lastly, the subgroup results indicate that the market-NAV gap is not uniform, meaning that the variables related to pricing deviations are not equal across fund sizes and fund management types. This supports a more conditional interpretation of the closed-end fund puzzle in which institutional setting and investor participation matter.

5.2 Managerial implications

For fund managers, the most consistent empirical signals are liquidity, fund size, and market capitalization. The negative liquidity coefficient implies that improving the tradability of fund units may be associated with a smaller discount. Practical solutions include increased transparency, prompt reporting, enhanced investor communication, and steps to facilitate orderly participation in the secondary market. In the primary revised model, the cost reduction is not statistically significant, so it is not a reliable way to remove the discount. Investors should

be aware that NAV should not be used as their only metric for assessing an investment. Even if the value of the underlying securities is observable, a fund may trade away from NAV. Therefore, investors should take a good look at all of these factors along with liquidity, market capitalization, fund size, payout behavior, and earnings information. The heterogeneity results also suggest that investors should not assume that the same pricing determinants apply equally to small, large, privately managed, and state-owned funds. From the regulator's point of view, the findings are used to inform the regulator on how to enhance the information landscape of CEMFs. More consistent disclosure of NAV, portfolio composition, trading activity, expenses, and distribution policies could reduce information asymmetry and make it easier for investors to evaluate persistent pricing deviations. The subgroup evidence also suggests that market-development initiatives may need to recognize differences in the trading environment and investor participation of smaller and larger funds rather than applying a one-size-fits-all approach.

6. Conclusion

This study revisits the closed-end fund puzzle in Bangladesh by examining the determinants of market-price deviations from NAV for 16 selected CEMFs over July 2011–June 2025. The baseline fixed-effects model shows that fund size and fund age are positively associated with the discount, while liquidity is negatively associated with it. After the Ramsey RESET test indicates specification concerns, the revised model incorporates market capitalization and EPS. The revised random-effects results show that DPR, fund size, and EPS are positively associated with MPD, while liquidity and market capitalization are negatively associated with MPD. Management expenses and fund age are not significant in the expanded specification. The main theoretical implication is that the Bangladesh market–NAV gap appears to reflect a combination of fundamental characteristics, trading conditions, and investor information rather than a single dominant mechanism. The findings broadly align with the literature, which shows that liquidity, investor sentiment, institutional characteristics, taxes, payout policy, and information have all been found to impact closed-end fund discounts. The subgroup results also indicate that the pricing process varies in certain aspects, depending on the size and type of the fund.

The study has limitations. The sample is restricted to 16 selected funds because of data availability; the panel is unbalanced, and the available causality output tests only one direction between MPD and DPR. However, the system-GMM analysis is based on a relatively high number of instruments for the number of funds, and therefore diagnostic evidence should be treated with caution. Future research should therefore use broader fund-level datasets, investor-flow and sentiment measures, and pooled interaction models that directly test subgroup differences. Nonlinear specifications, including quadratic terms, spline regressions, or threshold regression, would also be useful for examining whether the relationship between fund characteristics and the market–NAV gap changes beyond identifiable levels. These methods would help complement existing evidence, without making any assumption about the linearity and homogeneity of the discount mechanism across the entire CEMF market in Bangladesh.

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