Optimism Bias in Earnings Forecasts, Financial Leverage, and Corporate Earnings Management——Empirical Evidence from the Perspective of Managerial Overconfidence

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Abstract. Using Chinese A-share listed companies from 2016 to 2024 as the research sample, this study examines the effect of optimism bias in earnings forecasts on earnings management and its transmission mechanism from the perspective of managerial overconfidence. Because the conventional optimistic earnings forecast dummy variable (OC) only identifies the direction of the forecast and cannot adequately distinguish improvements in firm fundamentals from strategic disclosure, this study constructs a continuous indicator, OCBias, to capture unrealized optimistic expectations by measuring the extent to which the midpoint of the forecasted profit range exceeds actual profit. The results show that the coefficient of the conventional OC variable is positive but insignificant in the baseline model, whereas OCBias is significantly and positively associated with earnings management; this finding remains robust across alternative measurements and robustness tests. Financial leverage serves as a significant transmission channel. Profitability significantly strengthens the relationship between the conventional OC indicator and earnings management, whereas the moderating effect is not significant when the continuous OCBias measure is used. In ownership-based subsample tests, the positive association between OCBias and earnings management is significant for both state-owned and non-state-owned enterprises, while the between-group difference is not statistically significant. This study extends research on the determinants of earnings management by integrating managerial expectation bias with financing structure and provides empirical evidence for identifying financial reporting risk among listed firms.

Keywords: optimism bias in earnings forecasts; managerial overconfidence; financial leverage; earnings management; financing structure

1 Introduction

Earnings management is a central issue in research on financial reporting quality. Financial statements provide an important basis for investors, creditors, auditors, and

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regulators to assess firm value, solvency, and financial risk. If management adjusts reported profits through accounting estimates, accounting policy choices, or accrual arrangements, the authenticity, reliability, and comparability of accounting information may be impaired. Identifying the drivers of earnings management is therefore important for improving disclosure quality, protecting investors, and strengthening capital market governance.

Existing studies explain earnings management mainly from the perspectives of capital market pressure, debt contracts, compensation contracts, corporate governance, audit supervision, and the regulatory environment. This study further emphasizes that financial reporting decisions are ultimately judged and implemented by managers. Managers' cognitive biases, risk preferences, and reputation concerns may also affect accounting estimates and reporting strategies. Managerial overconfidence is reflected in managers' tendency to overestimate their own ability, firms' future profitability, and their control over operating outcomes, which may increase the incentive to manage earnings when expectations fail to materialize.

China's earnings forecast system provides an institutional setting for observing management's publicly disclosed performance expectations. However, using only whether a firm issues an optimistic earnings forecast to proxy for managerial overconfidence may generate measurement noise, because optimistic forecasts may result from genuine improvements in fundamentals, disclosure strategy, or market communication needs. Therefore, in addition to the conventional OC variable, this study constructs a continuous measure, OCBias, which captures unrealized optimistic expectations by measuring the extent to which the midpoint of the forecasted profit range exceeds actual profit. This shifts the focus from whether the forecast is optimistic to the magnitude of optimism relative to realized performance. Accordingly, the paper treats OCBias as an empirical indicator of unrealized optimism bias in earnings forecasts rather than as a direct psychological measurement of executive overconfidence.

Optimism bias in managerial forecasts may affect earnings management directly through more aggressive accounting estimates and accrual arrangements, and indirectly through financing structure. Overconfident managers tend to overestimate future cash flows and debt-servicing capacity while underestimating debt risk, thereby increasing reliance on debt financing. As financial leverage rises, firms face stronger debt-servicing pressure, tighter debt covenant constraints, and greater refinancing pressure, which may further increase managers' incentives to engage in earnings management.

Based on this logic, this study examines the relationship between optimism bias in earnings forecasts and earnings management, and further tests the transmission role of financial leverage, the contextual effect of profitability, and ownership-based heterogeneity. The marginal contributions are threefold. First, the study introduces the continuous OCBias variable to address the limitation of the binary OC measure. Second, it incorporates financial leverage into the mechanism analysis and uses the Bootstrap method to test indirect effects. Third, it identifies boundary conditions by considering profitability and ownership type, thereby providing evidence for detecting financial reporting risk among listed companies. The empirical analysis is positioned as evi-

dence of associations and transmission pathways rather than as a claim of strict causality.

2 Literature Review

2.1 Managerial Overconfidence and Financial Reporting Behavior

Managerial overconfidence is an important topic in behavioral corporate finance and upper echelons theory. It refers to managers' tendency to overestimate their abilities, firm prospects, and decision-making control. Recent studies show that overconfident CEOs and CFOs are more likely to engage in classification shifting, future earnings management, or real earnings management [1–4]. These studies provide a theoretical foundation for examining optimism bias in earnings forecasts from the perspective of managerial overconfidence.

Regarding overconfidence and earnings management, Choi et al. (2024), Sumiyana et al. (2023), Qiao et al. (2025), and Khlifi and Zouari (2021) provide evidence from classification shifting, future earnings management, CFO characteristics, and real earnings management, respectively [1–4]. However, most existing studies are based on foreign markets, merger and acquisition settings, or individual executive traits. The financial reporting consequences of publicly disclosed earnings expectation bias in China's A-share market remain underexplored. Research on earnings forecasts also shows that the institutional environment, forward-looking disclosure, and internal allocation of decision rights affect forecast quality and strategic disclosure [5–7]. Accordingly, this study uses both OC and the continuous OCBias measure to identify managers' unrealized optimistic expectations.

2.2 Financial Leverage and Earnings Management

Financial leverage reflects the degree of debt financing and financial risk and is an important variable linking financing decisions with financial reporting behavior. Debt financing may play a monitoring role; however, debt-servicing pressure, refinancing pressure, and contractual constraints may also motivate managers to improve reported profits and financial indicators through earnings management.

Carvalho et al. (2024) find that managerial overconfidence affects firms' capital structure rebalancing [8]. In the Chinese context, evidence on leverage manipulation and new debt issuance suggests that leverage is closely related to financial reporting adjustments [9,10]. Therefore, treating financial leverage as a transmission variable helps reveal the pathway from optimism bias in earnings forecasts to financing structure and then to earnings management.

2.3 Profitability, Ownership Type, and Contextual Differences in Earnings Management

Profitability is an important signal of operating performance and firm quality. Firms with higher profitability are more likely to attract attention from investors, creditors, and analysts, and the market tends to expect them to maintain sustainable profitability and stable growth. Such expectations may strengthen managers' incentives to maintain earnings continuity and a favorable performance image.

Ownership type is a key institutional feature of China's capital market. State-owned enterprises (SOEs) and non-state-owned enterprises differ in governance objectives, resource access, regulatory constraints, financing environments, and executive incentives. Evidence from China's A-share listed firms suggests that state ownership affects the choice between real and accrual-based earnings management strategies [11]. Accordingly, this study uses profitability as a moderating variable and ownership type as a dimension of heterogeneity to identify the boundary conditions under which optimism bias in earnings forecasts affects earnings management.

2.4 Literature Review Summary

In summary, existing studies have explained earnings management from the perspectives of managerial psychological traits, forward-looking disclosure, financial pressure, profitability, and ownership type. However, limited attention has been paid to the continuous magnitude of unrealized optimistic expectations in China's A-share market and its financial reporting consequences. Moreover, few studies have revealed the transmission mechanism through financial leverage. This study therefore constructs an analytical framework linking optimism bias in earnings forecasts, financial leverage, and earnings management, and further incorporates the moderating effect of profitability and ownership-based heterogeneity.

3 Theoretical Analysis and Research Hypotheses

3.1 Optimism Bias in Earnings Forecasts and Corporate Earnings Management

Managerial overconfidence is reflected in managers' overestimation of operating ability, future profitability, and control over operating outcomes. According to upper echelons theory, executives' cognitive bases and psychological traits influence strategic choices and financial judgments. Although optimism bias in earnings forecasts cannot be equated fully with overconfidence, the deviation between publicly disclosed expectations and realized outcomes provides observable evidence for identifying excessive managerial optimism.

From the perspective of information asymmetry, managers possess more internal information, while outside investors rely on financial reports, earnings forecasts, and public disclosures to assess firm value. When managers are excessively optimistic, they may interpret performance fluctuations as temporary disturbances and adjust

reported earnings through accruals or accounting estimates to signal operational stability to the market.

From the perspective of reputation maintenance, when actual performance falls short of market expectations or managers' previous forecasts, overconfident managers may be reluctant to acknowledge judgment errors and may instead use earnings management to preserve their image of managerial competence. Once an earnings forecast is publicly disclosed, subsequent financial reporting carries pressure to fulfill the forecast. When forecasted profits substantially exceed actual profits, such pressure is more likely to induce earnings management.

Hypothesis 1: The greater the optimism bias in earnings forecasts, the higher the degree of corporate earnings management.

3.2 The Mediating Role of Financial Leverage

Optimism bias in managerial expectations may also affect earnings management through financing structure. Behavioral corporate finance suggests that overconfident managers overestimate investment returns, future cash flows, and debt-servicing capacity while underestimating operating risk. Consequently, they are more likely to adopt aggressive financing strategies and increase the proportion of debt financing.

Financial leverage reflects the degree of debt financing and financial risk. Moderate leverage may have governance effects, but high leverage increases debt-servicing pressure and debt covenant constraints. As leverage rises, creditors pay greater attention to profitability, cash flow, and financial stability, while firms face stronger refinancing pressure and perceived default risk. Managers therefore have stronger incentives to adjust profits through earnings management.

Hypothesis 2: Financial leverage mediates the relationship between optimism bias in earnings forecasts and corporate earnings management.

3.3 The Moderating Role of Profitability

Profitability is both a direct reflection of operating outcomes and an important signal used by external markets to assess firm quality. Highly profitable firms are usually viewed as operationally stable and promising, and they attract more attention from investors, creditors, and analysts. The market therefore forms higher expectations regarding their earnings stability.

For overconfident executives, higher profitability may further reinforce optimistic judgment. When subsequent operations fluctuate, managers may be more inclined to use earnings management to maintain earnings continuity and smoothness in order to avoid market doubts about the firm's growth prospects and their managerial ability.

Hypothesis 3: Profitability strengthens the positive relationship between managerial optimistic forecast tendency and corporate earnings management.

3.4 Ownership-Type Heterogeneity

Ownership type is an important institutional variable in the governance environment of Chinese listed firms. SOEs undertake both economic and policy objectives and are affected by government supervision, administrative evaluation, and organizational appointment systems; therefore, the transmission of executives' psychological traits to financial behavior may be more constrained. Non-SOEs face market competition, financing constraints, and investor evaluation more directly, and managerial cognitive bias may more easily affect their investment, financing, and financial reporting behavior.

However, with improvements in information disclosure systems and corporate governance mechanisms, both SOEs and non-SOEs face financial reporting quality constraints and external evaluation pressure. Whether ownership type significantly affects the relationship between optimism bias and earnings management is therefore an empirical question.

Hypothesis 4: Ownership type affects the relationship between optimism bias in earnings forecasts and corporate earnings management.

4 Research Design

4.1 Sample Selection and Data Sources

This study uses Chinese A-share listed firms as the research sample, and the data are mainly obtained from the CSMAR database. The sample is processed as follows: financial firms, ST firms, and observations from listing years are excluded; observations from 2025 onward are excluded; observations with missing key variables are removed; and major continuous variables are winsorized at the 1st and 99th percentiles. The final sample consists of 10,742 firm-year observations from 2016 to 2024.

For multiple earnings forecasts issued by the same firm in the same year, this study conducts firm-year matching between annual earnings forecasts and the corresponding annual actual profit. To reduce timing ambiguity, the forecast information used to construct OC and OCBias is matched to annual performance information disclosed before the annual report and is then compared with actual annual profit reported in the annual report. When more than one annual performance forecast is available for the same fiscal year, the forecast record corresponding to the final annual forecast before annual report disclosure is used to construct the optimism-bias variables. Empirical tests are conducted using Stata. The models control for year and industry fixed effects and use firm-level clustered robust standard errors. This study mainly identifies empirical associations and transmission pathways, and it mitigates potential endogeneity concerns using lagged variables, firm fixed effects, and audit control variables.

4.2 Variable Definitions

Dependent variable. The degree of earnings management is measured by AbsDA, defined as the absolute value of discretionary accruals (DA) estimated using the mod-

ified Jones model of Dechow et al. (1995) [12]. Total accruals are first calculated as follows:

$$TA_{i,t} = NI_{i,t} - CFO_{i,t} \tag{1}$$

The modified Jones model is then estimated separately within each industry-year group, and all variables in the accrual model are scaled by lagged total assets. To ensure reliable coefficient estimation, industry-year groups with fewer than 10 firm-year observations are excluded. After estimating the industry-year regression, the model residual is defined as DA; its absolute value is AbsDA. A larger AbsDA indicates a higher degree of accrual-based earnings management. Major continuous variables are winsorized at the 1st and 99th percentiles to reduce the influence of abnormal values.

$$\frac{TA_{i,t}}{A_{i,t-1}} = \theta_1 \frac{1}{A_{i,t-1}} + \theta_2 \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} + \theta_3 \frac{PPE_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \tag{2}$$

$$DA_{i,t} = \hat{\varepsilon}_{i,t},\ AbsDA_{i,t} = |DA_{i,t}| \tag{3}$$

Explanatory variables. The core explanatory variable is the continuous optimism-bias measure, OCBias, and the auxiliary variable is the conventional optimistic earnings forecast dummy, OC. If a firm issues an optimistic forecast such as "large increase," "slight increase," "pre-increase," "turnaround to profit," or "continued profitability," OC equals 1; if it issues a non-optimistic forecast such as "large decrease," "slight decrease," "pre-decrease," "turnaround to loss," or "continued loss," OC equals 0. Because OC only reflects forecast direction and may capture genuine performance improvement, disclosure strategy, or market communication motives, it is not used as the only core evidence.

OCBias is constructed using the difference between the midpoint of the upper and lower bounds of the forecasted profit range and actual profit. If the forecast midpoint exceeds actual profit, a larger difference indicates stronger unrealized optimistic expectations; if the forecast midpoint does not exceed actual profit, OCBias equals 0. Compared with OC, OCBias captures both forecast direction and the magnitude of deviation and is therefore more suitable as the core variable in this study. Importantly, OCBias should not be interpreted as a direct observation of executives' psychological overconfidence; it is a data-based proxy for unrealized optimistic expectations, with managerial overconfidence serving as the theoretical lens for interpretation.

$$ForecastMid_{i,t} = (ForecastUpper_{i,t} + ForecastLower_{i,t})/2 \tag{4}$$

$$\mathrm{OCBias}_{i,t} = \max[(\mathrm{ForecastMid}_{i,t} - \mathrm{ActualProfit}_{i,t})/\mathrm{TotalAssets}_{i,t}, 0] \tag{5}$$

For ease of interpretation and robustness testing, this study also constructs OCBias_Z, High_OCBias, and OC-only OCBias calculated only within the optimistic forecast subsample. Because some forecast types may carry weaker optimistic implications, OC-based results are mainly treated as conventional measures and supplementary evidence, whereas the core conclusions are based on OCBias and its alternative measures.

Mediating variable. Financial leverage (Lev) is measured by the asset-liability ratio, namely total liabilities divided by total assets. A higher value indicates a higher degree of debt financing and financial risk.

Moderating variable. High profitability (HighROA) is defined according to the industry-year median of ROA: firms with ROA above the median are coded as 1, and 0 otherwise.

Control variables. This study controls for firm size, profitability, growth, operating cash flow, ownership concentration, board size, proportion of independent directors, and ownership type. Audit fees and audit opinions are further included in some robustness tests. Variable definitions are shown in Table 1.

Table 1. Variable definitions

Variable type	Symbol	Variable name	Definition and calculation
Dependent variable	AbsDA	Degree of earnings management	Absolute value of discretionary accruals (DA) estimated using the modified Jones model
Explanatory variable	OC	Conventional optimistic forecast variable	Equals 1 for optimistic earnings forecasts and 0 otherwise; used as an auxiliary measure of managerial optimism
Explanatory variable	OCBias	Optimism bias in earnings forecasts	max[(forecast profit midpoint − actual profit)/total assets, 0]; core explanatory variable
Explanatory variable	OCBias_Z	Standardized optimism bias	Standardized value of OCBias
Explanatory variable	High_OCBias	High optimism-bias group	Equals 1 if OCBias is in the top quartile of the sample and 0 otherwise
Mediating variable	Lev	Financial leverage	Total liabilities/total assets
Moderating variable	HighROA	High profitability	Equals 1 if ROA is above the industry-year median and 0 otherwise
Control variable	Size	Firm size	Natural logarithm of total assets
Control variable	ROA	Profitability	Net profit/total assets
Control variable	Growth	Growth	Operating revenue growth rate
Control variable	CFO	Operating cash flow	Net cash flow from operating activities/total assets
Control variable	Top1	Ownership concentration	Shareholding ratio of the largest shareholder
Control variable	Board	Board size	Natural logarithm of the number of board members
Control variable	Indep	Independent director ratio	Number of independent directors/number of board members
Control variable	SOE	Ownership type	Equals 1 for state-owned enterprises and 0 otherwise
Audit control	AuditFee	Audit fee	Natural logarithm of audit fees
Audit control	AuditOpinion	Audit opinion	Equals 1 for a standard unqualified audit opinion and 0 otherwise

Note: All continuous variables are winsorized at the 1st and 99th percentiles in the empirical tests.

4.3 Model Specification and Identification Strategy

To test the relationship between optimism bias in earnings forecasts and earnings management, this study specifies Model (6), using OCBias as the core explanatory variable and reporting the results for the conventional OC variable as supplementary evidence. Because financial leverage is specified as a transmission variable, Lev is

not directly controlled in the baseline model to avoid absorbing the main effect in advance. All baseline regressions include year and industry fixed effects and use firm-level clustered robust standard errors.

$$bsDA_{i,t} = \beta_0 + \beta_1 CoreVar_{i,t} + \beta_2 Controls_{i,t} + \mu_t + \lambda_j + \varepsilon_{i,t} \quad (6)$$

To test the mediating effect of financial leverage, this study further specifies Models (7) and (8):

$$Lev_{i,t} = \alpha_0 + \alpha_1 CoreVar_{i,t} + \alpha_2 Controls_{i,t} + \mu_t + \lambda_j + \varepsilon_{i,t} \quad (7)$$

$$AbsDA_{i,t} = \gamma_0 + \gamma_1 CoreVar_{i,t} + \gamma_2 Lev_{i,t} + \gamma_3 Controls_{i,t} + \mu_t + \lambda_j + \varepsilon_{i,t} \quad (8)$$

where CoreVar denotes OCBias or OC. The Bootstrap method is used to estimate the indirect effect a × b and its confidence interval, where a represents the coefficient of CoreVar in the Lev equation and b represents the coefficient of Lev in the AbsDA equation. If the confidence interval excludes zero, the indirect effect of financial leverage is considered statistically significant. The mediation test identifies a statistically meaningful transmission pathway rather than strict causal mediation.

To test the moderating role of profitability, this study specifies Model (9):

$$AbsDA_{i,t} = \delta_0 + \delta_1 CoreVar_{i,t} + \delta_2 HighROA_{i,t} + \delta_3 (CoreVar_{i,t} \times HighROA_{i,t}) + \delta_4 Controls_{i,t} + \mu_t + \lambda_j + \varepsilon_{i,t} \quad (9)$$

where i, t, and j denote firm, year, and industry, respectively; Controls denotes the control variable set; and μ_t and λ_j denote year and industry fixed effects.

If δ_3 is significantly positive, profitability strengthens the relationship between managerial optimistic forecast tendency and earnings management. Ownership-type heterogeneity is tested using subsample regressions and interaction models.

In addition, this study conducts robustness tests using lagged explanatory variables, firm fixed effects, and audit control variables to alleviate simultaneity bias and omitted-variable concerns. Nevertheless, the results are interpreted as empirical associations.

5 Empirical Results

5.1 Descriptive Statistics

Table 2 shows that the mean value of AbsDA is 0.0662, indicating the presence of accrual-based earnings management among sample firms. The mean value of OC is 0.5610, suggesting that approximately 56.10% of observations issued optimistic forecasts. The mean and median values of OCBias are 0.0048 and 0.0008, respectively, indicating that optimism bias exists and varies across firms. The mean value of Lev is 0.4181, implying an average asset-liability ratio of approximately 41.81%. The mean value of SOE is 0.2259, indicating that the sample is dominated by non-state-owned enterprises.

Table 2. Descriptive statistics

Variable	N	Mean	Std. Dev.	Min	Median	Max
AbsDA	10742	0.0662	0.0688	0.0007	0.0451	0.3828
OC	10742	0.5610	0.4963	0	1	1
OCBias	10742	0.0048	0.0121	0	0.0008	0.0879
OCBias_Z	10742	-0.0000	1.0000	-0.3974	-0.3325	6.8408
High_OCBias	10742	0.2500	0.4331	0	0	1
OC-only OCBias	10742	0.0015	0.0042	0	0	0.0288
Lev	10742	0.4181	0.2157	0.0536	0.4033	0.9726
HighROA	10742	0.4527	0.4978	0	0	1
Size	10742	22.0034	1.1736	19.7980	21.8504	25.6561
ROA	10742	0.0226	0.0905	-0.2968	0.0255	0.3020
Growth	10742	0.1666	0.4692	-0.6517	0.0983	2.8943
CFO	10742	0.0444	0.0800	-0.1900	0.0399	0.3177
Top1	10742	0.2981	0.1311	0.0835	0.2772	0.6739
Board	10742	2.0789	0.1899	1.6094	2.1972	2.4849
Indep	10742	0.3802	0.0530	0.3333	0.3636	0.5714
SOE	10742	0.2259	0.4182	0	0	1

Note: This table reports descriptive statistics for the main variables. Continuous variables are winsorized at the 1st and 99th percentiles.

5.2 Correlation Analysis and Multicollinearity Test

Table 3 shows that the correlation coefficient between OCBias and AbsDA is 0.2553, preliminarily supporting a positive relationship between the two variables. The correlation between OC and AbsDA is relatively weak, indicating that the single optimistic forecast dummy may contain measurement noise. The maximum VIF values of all models are below 10, indicating that severe multicollinearity is not present.

Table 3. Correlation matrix and VIF test

Panel A. Correlation matrix

	AbsDA	OC	OCBias	Lev	HighROA	Size	ROA	Growth	CFO	SOE
AbsDA	1.0000									
OC	-0.0139	1								
OCBias	0.2553	-0.1564	1							
Lev	0.0367	-0.0647	0.0524	1						
HighROA	0.0369	0.4824	-0.1533	-0.1951	1					
Size	-0.0714	-0.0043	-0.0359	0.4534	-0.0354	1				
ROA	-0.0819	0.5934	-0.3104	-0.2467	0.6234	-0.0602	1.0000			
Growth	0.1055	0.3460	-0.0716	-0.0375	0.2430	-0.0366	0.3633	1		
CFO	-0.1066	0.2997	-0.1015	-0.1057	0.3457	0.0605	0.4906	0.1353	1	
SOE	-0.0752	-0.0370	-0.0957	0.2849	-0.0866	0.3353	-0.0849	-0.0388	-0.0439	1

Panel B. VIF test

Model	Maximum VIF	Mean VIF	Core-variable VIF	Conclusion
OC model	2.4764	1.5383	1.6635	No severe multicollinearity (all VIFs < 10)
OCBias model	2.3311	1.4702	1.1362	No severe multicollinearity (all VIFs < 10)
OC-only OCBias model	2.1924	1.4504	1.0665	No severe multicollinearity (all VIFs < 10)

Note: Panel A reports Pearson correlation coefficients for the main variables. Panel B reports the VIF test results. The maximum VIF values in all models are below 10, indicating no severe multicollinearity.

5.3 Baseline Regression and Alternative Measures of Optimism Bias

Table 4 reports the baseline regression and alternative-measure tests. In column (1), the coefficient of the conventional OC variable is positive but insignificant, suggesting that identifying managerial optimism solely by whether an optimistic forecast is issued has limited explanatory power. In column (2), the coefficient of OCBias is 1.2868 and is significantly positive at the 1% level, indicating that stronger unrealized optimistic expectations are associated with a higher degree of earnings management. After controlling for Lev in column (3), OCBias remains significant, suggesting that the relationship is not fully absorbed by the leverage channel. Columns (4)–(6) use OCBias_Z, High_OCBias, and OC-only OCBias, respectively, and all results remain significantly positive. Overall, Hypothesis 1 is supported, and the continuous OCBias measure outperforms the conventional OC variable.

Table 4. Baseline regression and alternative measures of optimism bias

Variable	(1) AbsDA	(2) AbsDA	(3) AbsDA	(4) AbsDA	(5) AbsDA	(6) AbsDA
OC	0.0023					
	(0.0018)					
OCBias		1.2868***	1.2775***			
		(0.0955)	(0.0956)			
Lev			0.0201***			
			(0.0046)			
OCBias_Z				0.0156***		
				(0.0012)		
High_OCBias					0.0176***	
					(0.0017)	
OC-only OCBias						1.3140***
						(0.2320)
Size	-0.0018**	-0.0019***				
	(0.0008)	(0.0007)				
ROA	-0.1118***	-0.0326*				
	(0.0212)	(0.0188)				
Growth	0.0203***	0.0193***				
	(0.0022)	(0.0021)				
CFO	-0.0494***	-0.0643***				

	(0.0192)	(0.0189)				
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-clustered SE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10742	10742	10742	10742	10742	10742
R-squared	0.0860	0.1288	0.1315	0.1288	0.0968	0.0916

*Note: The dependent variable is AbsDA. The baseline model does not control for Lev because financial leverage is tested as a mediating variable. Firm-level clustered robust standard errors are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. The same notation applies to subsequent tables.*

5.4 Mediating Effect of Financial Leverage

Table 5 shows that the coefficient of OC on Lev is 0.0406 and significant at the 1% level, indicating that firms issuing optimistic forecasts have higher leverage. Lev is also significantly and positively associated with AbsDA. When OCBias is used, OCBias significantly increases Lev and remains significantly positively associated with AbsDA after Lev is controlled. These results indicate that financial leverage is an important transmission channel through which optimism bias affects earnings management.

Table 5. Financial leverage as a mediating channel: Regression evidence

Variable	**(1) Lev**	**(2) AbsDA**	**(3) Lev**	**(4) AbsDA**
OC	0.0406***	0.0014		
	(0.0044)	(0.0018)		
OCBias			0.4614**	1.2775***
			(0.2168)	(0.0956)
Lev		0.0222***		0.0201***
		(0.0048)		(0.0046)
Size				
ROA				
Growth				
CFO				
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Firm-clustered SE	Yes	Yes	Yes	Yes
Observations	10742	10742	10742	10742
R-squared	0.3373	0.0892	0.3326	0.1315

Note: Columns (1) and (3) test the effects of OC/OCBias on financial leverage. Columns (2) and (4) include Lev in the AbsDA model.

The Bootstrap results further support the mediating effect. Table 6 shows that when OC is used as the explanatory variable, the indirect effect is 0.0009 with a 95% confidence interval of [0.0005, 0.0013]. When OCBias is used, the indirect effect is 0.0093 with a 95% confidence interval of [0.0007, 0.0179]. Both intervals exclude zero. Because the total effect of OC is insignificant, this result is more appropriately interpreted as evidence of a significant indirect pathway. For OCBias, the evidence supports a clearer partial transmission effect. Thus, Hypothesis 2 is supported.

Table 6. Bootstrap mediation test

Effect	OC: Coef	OC: Bootstrap SE	OC: 95% CI	OCBias: Coef	OCBias: Bootstrap SE	OCBias: 95% CI
Indirect	0.0009***	(0.0002)	[0.0005, 0.0013]	0.0093**	(0.0044)	[0.0007, 0.0179]
Direct	0.0014	(0.0017)	[-0.0019, 0.0047]	1.2775***	(0.0915)	[1.0981, 1.4569]
Total	0.0023	(0.0017)	[-0.0010, 0.0056]	1.2868***	(0.0915)	[1.1075, 1.4661]

Note: The indirect effect is the product of the coefficient of OC/OCBias on Lev and the coefficient of Lev on AbsDA. If the 95% confidence interval excludes zero, the mediating effect is significant.

5.5 Moderating Effect of Profitability

Table 7 shows that the coefficient of OC × HighROA is 0.0158 and significant at the 1% level. After adding Lev, the interaction term remains significantly positive, indicating that the positive relationship between the conventional optimistic forecast indicator and earnings management is more pronounced among highly profitable firms. When OCBias is used, OCBias itself remains significantly positive, but OCBias × HighROA is insignificant. This suggests that the moderating effect of profitability is evident for the conventional OC indicator but not for the continuous OCBias measure. Therefore, Hypothesis 3 receives partial support and should be interpreted mainly in relation to the conventional OC indicator.

Table 7. Moderating effect of profitability

Variable	(1) AbsDA	(2) AbsDA	(3) AbsDA
OC	-0.0088***	-0.0099***	
	(0.0020)	(0.0020)	
HighROA	0.0143***	0.0161***	0.0213***
	(0.0028)	(0.0028)	(0.0019)
OC × HighROA	0.0158***	0.0150***	
	(0.0030)	(0.0030)	
Lev		0.0268***	
		(0.0047)	
OCBias			1.2466***
			(0.1012)
OCBias × HighROA			-0.1289
			(0.2619)

Size			
ROA			
Growth			
CFO			
Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Firm-clustered SE	Yes	Yes	Yes
Observations	10742	10742	10742
R-squared	0.1057	0.1104	0.1420

Note: HighROA is a dummy variable equal to 1 if ROA is above the industry-year median. The coefficient of OC × HighROA is significantly positive, indicating that profitability strengthens the relationship between the conventional OC indicator and AbsDA. The interaction term OCBias × HighROA is not statistically significant, suggesting that the moderating effect is not supported when the continuous OCBias measure is used.

5.6 Ownership-Type Heterogeneity

Table 8 shows that the interaction term OCBias × SOE is insignificant in the full-sample model, indicating no significant between-group difference between SOEs and non-SOEs. In subsample regressions, the coefficients of OCBias are 1.3545 and 1.2575 for SOEs and non-SOEs, respectively, and both are significantly positive at the 1% level. Therefore, the positive association between optimism bias in earnings forecasts and earnings management exists in both ownership groups, but ownership type does not significantly change the strength of this association. Hypothesis 4 is not strongly supported in terms of between-group differences.

Table 8. Ownership-type heterogeneity

Variable	**(1) Full sample**	**(2) SOEs**	**(3) Non-SOEs**
OCBias	1.2848***	1.3545***	1.2575***
	(0.1010)	(0.2444)	(0.1023)
SOE	-0.0039*		
	(0.0020)		
OCBias × SOE	0.0174		
	(0.2624)		
Size			
ROA			
Growth			
CFO			
Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Firm-clustered SE	Yes	Yes	Yes
Observations	10742	2427	8315
R-squared	0.1288	0.1643	0.1221

Note: OCBias is significantly positive in both SOEs and non-SOEs, whereas the OCBias × SOE interaction term is insignificant, indicating that the difference between the two ownership groups is not statistically significant.

5.7 Robustness Tests

This study further conducts several robustness tests: lagged OC and OCBias are used to alleviate simultaneity bias; firm and year fixed effects are added to control for time-invariant omitted variables; audit fees and audit opinions are included to control for differences in audit supervision; and directional DA is used to examine the direction of accrual adjustments. Table 9 shows that the main conclusions remain valid when lagged variables, firm fixed effects, and audit controls are used. In the directional DA model, the coefficient of OCBias is negative, indicating that optimism bias may also affect the direction of accrual adjustments. Because directional DA is not equivalent to the degree of earnings management, AbsDA remains the primary measure in this study. Overall, the main conclusions are robust in these supplementary tests, although they do not eliminate all possible endogeneity concerns.

Table 9. Robustness tests

Variable	(1) Lagged OC	(2) Lagged OCBias	(3) Firm FE OC	(4) Firm FE OCBias	(5) Audit controls	(6) Directional DA
Lagged OC	0.0164***					
	(0.0015)					
Lagged OCBias		0.0013***				
		(0.0000)				
OC			0.0069***			
			(0.0020)			
OCBias				0.9882***	1.1920***	-0.2205***
				(0.1028)	(0.0950)	(0.0671)
AuditFee					-0.0007	
					(0.0011)	
AuditOpinion					-0.0253***	
					(0.0044)	
Size						
ROA						
Growth						
CFO						
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	No	No	Yes	Yes
Firm-clustered SE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10742	10742	10742	10742	10742	10742
R-squared	0.0969	0.0874	0.0576	0.0831	0.1346	0.6922

Note: Columns (1)–(2) use lagged explanatory variables; columns (3)–(4) include firm and year fixed effects; column (5) includes audit controls; and column (6) uses directional DA as the dependent variable, which should be interpreted as the direction of accrual-based earnings management rather than its degree.

6 Conclusions, Implications, and Limitations

6.1 Conclusions

Using Chinese A-share listed companies from 2016 to 2024 as the research sample, this study examines the relationship between optimism bias in earnings forecasts and earnings management from the perspective of managerial overconfidence, and further investigates the roles of financial leverage, profitability, and ownership type. To reduce the measurement noise of the conventional OC variable, this study constructs the continuous OCBias measure and verifies the results using alternative measures and robustness tests. The interpretation of OCBias is kept cautious: it captures unrealized optimism bias in earnings forecasts rather than directly observing executives' psychological overconfidence.

The findings are as follows. First, the conventional OC variable is positive but insignificant in the baseline model, whereas the continuous OCBias variable is significantly and positively associated with earnings management, and this result remains robust. Second, financial leverage is an important transmission pathway through which optimism bias in earnings forecasts affects earnings management, as shown by significant Bootstrap indirect effects. Third, the conventional OC variable shows significant positive evidence in the lagged-variable model, the firm fixed effects model, and the high-profitability context, suggesting that its explanatory power is conditional; however, the moderating effect of profitability is not significant when OCBias is used. Fourth, OCBias is significantly positive in both SOEs and non-SOEs, but the between-group difference is not statistically significant. Thus, ownership type does not appear to materially alter the strength of the OCBias–earnings management association.

Overall, corporate earnings management is affected not only by external governance and financing pressure but also by managerial psychological traits and performance expectation bias. When publicly disclosed optimistic expectations fail to materialize, firms are more likely to exhibit a higher degree of accrual-based earnings management. Integrating optimism bias in earnings forecasts, financial leverage, and earnings management into a unified framework helps identify financial reporting risk and helps explain how managerial expectation bias is associated with financial reporting behavior.

6.2 Managerial Implications

Listed companies should improve internal governance and strengthen the supervision of earnings expectations, financing decisions, and accounting estimates by boards of directors and audit committees. Firms that frequently issue optimistic forecasts, show large differences between forecasts and actual profits, or maintain high leverage should be closely monitored for potential earnings management risk.

Auditors should incorporate managers' excessively optimistic expectations into audit risk assessment and pay attention to the relationship among forecast realization, debt expansion, and earnings quality. For firms with large optimism bias and high

leverage, auditors should increase the assessed risk of material misstatement and strengthen audit procedures related to accruals and accounting estimates.

Investors and creditors should not make decisions solely based on short-term profits or optimistic earnings forecasts. Instead, they should jointly evaluate forecast realization, financial leverage, operating cash flow, and earnings quality. For firms with large optimism bias and high leverage, the reliability of financial reports and debt risk should be assessed more cautiously.

Regulators should strengthen supervision over discrepancies between earnings forecasts and actual annual report results, improve the earnings forecast disclosure system, enhance the information transparency of firms issuing optimistic forecasts, and pay attention to financial reporting risks arising from excessive managerial optimism.

6.3 Limitations and Future Research

This study has several limitations. First, managerial overconfidence is difficult to observe directly. Although OC and OCBias are used as proxy measures, they may still be affected by firm fundamentals, disclosure strategies, prior earnings-management behavior, and the external information environment. Therefore, the results should be interpreted as empirical associations between optimistic expectation bias and earnings management rather than as definitive evidence of executives' psychological traits. Future research may use executive personal characteristics, textual tone, option holdings, insider trading, and other indicators to better capture overconfidence. Second, this study mainly examines accrual-based earnings management; future research may incorporate real earnings management indicators. Third, although fixed effects, lagged variables, and Bootstrap tests are used to enhance reliability, strict causal identification is not achieved. Future studies may further test the relationship using exogenous shocks, quasi-natural experiments, instrumental variables, or matching methods.

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