

A Study on the Predictive Power of MD&A Text Features on the Future Profitability of A-Share Listed Companies

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Abstract

Against the backdrop of increasing attention to narrative information in the capital market, this paper takes A-share listed companies in Shanghai and Shenzhen from 2013 to 2023 as samples and examines the predictive role of management tone, forward-looking information, and text length on the future profitability of enterprises based on the management discussion and analysis (MD&A) texts in annual reports. The study finds that MD&A text features have significant information content, with net positive tone and text length showing a significant positive correlation with the future profitability of enterprises, and forward-looking information showing a significant negative correlation. Further analysis shows that narrative disclosure in annual reports can provide incremental information beyond financial data for identifying the future operating performance of enterprises. The conclusions of this paper provide empirical evidence for understanding the information value of Chinese financial texts and optimizing the information disclosure of listed companies.

Keywords

MD&A, text analysis, future profitability, management tone, forward-looking information

1. Introduction

In recent years, with the continuous deepening of capital market reforms in my country, the role of information disclosure in resource allocation and investment decision-making has become increasingly prominent. Against the backdrop of policies such as the steady advancement of the comprehensive registration system, improved quality of listed companies, and strengthened investor protection, the market has placed higher demands on the authenticity, completeness, and effectiveness of listed companies' information disclosure. Compared to the structured data provided by traditional financial statements, the narrative information in annual reports can supplement and reflect the company's operating environment, management judgment, and future development expectations, and is therefore attracting increasing attention from investors and regulators.

At the same time, my country's economic development environment and capital market operating environment have undergone significant changes in recent years. Affected by factors such as industrial

restructuring, digital transformation, intensified industry competition, and increased external uncertainty, companies' future profitability faces greater volatility, and investors are paying more attention to companies' explanations of their current operating conditions and their outlook for future development. In this context, Management Discussion and Analysis (MD&A), as an important part of annual reports that centrally reflects management's judgment, operational analysis, and future planning, has gradually become an important basis for external information users to identify corporate value and judge future prospects [1-3].

With the widespread application of text analysis methods in accounting and financial research, research on the information content of annual report texts is constantly increasing. Existing literature mainly discusses the relationship between management tone, forward-looking information, and text readability, but research on the relationship between the textual characteristics of MD&A of A-share listed companies and their future profitability is still insufficient, especially lacking evidence to compare and analyze multiple textual characteristics within a unified framework. Therefore, it is necessary to further examine the information value of MD&A textual characteristics and their predictive role in the future profitability of enterprises, in the context of my country's capital market.

2. Literature Review

Compared to traditional financial statements, the Management Discussion and Analysis (MD&A) in annual reports provides supplementary explanations of the company's operating conditions, industry environment, risk factors, and future plans through narrative language, providing "soft information" beyond financial figures, and thus has important decision-making usefulness [1-3]. Existing research on the information value of MD&A and other corporate narrative texts mainly focuses on tone, forward-looking disclosure, and readability or complexity.

Tone research mainly focuses on the management attitude and its economic consequences reflected by positive or negative expressions in corporate disclosure texts. Henry (2008) found that the use of more positive language in earnings announcements affects investor perception and market reaction [4]. Davis et al. (2012) further pointed out that management language not only has emotional connotations but also contains incremental information about the company's future operating conditions [5]. Huang et al. (2014) emphasized that tone may simultaneously reflect the transmission of true information and the management's motivation for impression management, thus its economic consequences have dual attributes [6]. In the Chinese context, with the increased availability of listed company text data, domestic scholars have begun to pay attention to the information content of management tone. Xie Deren et al. (2015) found, based on a study of earnings conference texts, that management tone can predict the company's future performance to a certain extent [7]. Tang Shaoqing (2020) also found that positive tone is significantly associated with corporate performance [8].

Forward-looking information mainly refers to the statements made by management in the text regarding future operating goals, strategic arrangements, market opportunities, and development plans. Because this type of information directly involves the company's future expectations, it is usually regarded as narrative disclosure content with high value in the capital market. Li (2010) pointed out that forward-looking statements in company documents can provide investors with incremental information for understanding the company's future prospects [9]. Muslu et al. (2015) further found that forward-looking MD&A disclosures help improve the company's information environment and influence the judgment of external information users [10]. Domestic research has also begun to examine the motivations and economic consequences of forward-looking information disclosure from the perspective of China's capital market. Wang Xiuli et al. (2020) found that forward-looking information disclosure in annual reports has strong strategic characteristics from the perspective of controlling shareholder equity pledge [11]. Xu Shuai et al. (2023) showed that forward-looking information affects the accuracy of analysts' earnings forecasts, but its effect is not always consistent [12]. Hu Nan et al. (2021) explained from the perspective of managerial behavior bias that future-oriented statements in corporate documents may carry complex information at the governance and behavioral levels [13]. It can be seen that although forward-looking information has potential information increment, its explanatory direction is not stable. It may reflect corporate development confidence or management's expected guidance behavior.

Regarding the readability and complexity of corporate disclosure texts, foreign literature has formed a relatively mature research framework. Li (2008) found that the worse the readability of an annual report, the

more complex the company's current operating conditions and the weaker the sustainability of its earnings [14]. You and Zhang (2009) pointed out that complex financial reports increase investors' information processing costs, leading to insufficient market response to company information [15]. Miller (2010) further explained from the perspective of investor heterogeneity that text complexity affects the information interpretation ability of different types of investors [16]. It is worth noting that the measurement of “readability” in existing studies is not entirely consistent. Some measures are based on sentence length, word length, and language structure, while others use text length as a proxy variable for complexity or reading costs. For annual reports and MD&A, text length may have a dual meaning: on the one hand, increased length may increase investors' information processing costs; on the other hand, longer text may also mean that the company discloses more fully, providing more detailed explanations of operating conditions, risk factors, and future arrangements. Therefore, whether text length reflects a “complexity effect” or a “disclosure adequacy effect” on future operating performance still needs to be empirically tested in specific institutional backgrounds and market environments.

Existing research provides an important foundation for understanding the informational value of corporate narrative disclosures, but it still has the following shortcomings. First, existing research mostly focuses on single textual features, lacking a systematic comparison of multi-dimensional features such as tone, forward-looking information, and text length. Second, existing literature pays more attention to market reactions, analyst forecasts, or current operating consequences, with relatively few studies directly examining the predictive role of annual report MD&A on a company's future profitability. Third, although domestic research has begun to focus on the informational value of Chinese financial texts, direct predictive evidence based on a long-term sample of the Chinese A-share market and using annual report MD&A as the subject remains insufficient, especially regarding the direction of the effects of forward-looking information and text length, for which no consensus has been reached.

Based on these shortcomings, this paper uses a sample of A-share listed companies in Shanghai and Shenzhen from 2013 to 2023, extracting MD&A textual features from three dimensions: management tone, forward-looking information, and text length, to examine their predictive role on a company's future profitability, aiming to provide supplementary evidence for research on the decision-making usefulness of Chinese financial narrative information.

3. Research Objectives

Based on a literature review, in the incremental information and future profit forecasting aspects of MD&A text features, the tone, forward-looking statements, and text length in MD&A are not merely linguistic forms, but may reflect management's understanding of the company's current operating situation and future trends. Especially in the A-share market, narrative texts often carry important supplementary information beyond financial figures, thus possessing potential value in predicting a company's future profitability. Existing research also indicates that company disclosure texts can convey incremental information and, to some extent, influence investors' judgments about a company's future performance [3, 9]. The following literature review will further investigate this viewpoint.

To deep dive the shortcomings of current literature review, this paper uses A-share listed companies in Shanghai and Shenzhen from 2013 to 2023 as a sample, extracting MD&A text features from three dimensions: management tone, forward-looking information, and text length, to examine their predictive role in a company's future profitability, aiming to provide supplementary evidence for research on the decision-making usefulness of Chinese financial narrative information. The author propose the following hypothesis.

H1: Management tone has a significant impact on the future profitability of A-share listed companies.

H2: Forward-looking information has a significant impact on the future profitability of A-share listed companies.

H3: Text length has a significant impact on the future profitability of A-share listed companies.

4. Methodology

4.1 Sample Selection and Data Sources

This paper selects A-share listed companies in Shanghai and Shenzhen from 2013 to 2023 as the initial sample, and filters them according to the following criteria: (1) Financial industry listed companies are excluded; (2) ST, *ST, and delisted samples are excluded; (3) Samples with missing MD&A text or core financial data are excluded; (4) All continuous variables are shortened to the 5th and 95th percentiles to remove extreme value interference. A total of 32,000 observations are obtained.

The MD&A text data, listed company financial data, industry classification, and listing status data used in this paper are all from the CSMAR database and the China Research Data Service Platform (CNRDS).

4.2 Variable Definition

4.2.1 Depended Variable: Return on Equity in the Next Period (ROE_i^{t+1})

This paper defines future profitability as the return on equity of the company in the next fiscal year, denoted as ROE_{t+1} . Referring to existing research on the definition of future profitability, the ROE in year T+1 is used as a proxy variable for the company's future profitability [7,8]. Return on equity (ROE) reflects a company's profitability, return on equity, and capital utilization efficiency, making it a crucial indicator for measuring corporate performance.

In variable construction, this paper uses annual ROE data from sample companies, grouping them by stock code and shifting the ROE forward by one period to obtain the future period's ROE variable ROE_{t+1} , i.e.:

$$ROE_t1_{i,t} = ROE_{i,t+1}$$

Where $ROE_t1_{i,t}$ represents company i's ROE in year t+1, used to measure the company's future profitability. This processing ensures that the MD&A text features in year T precede the profit results in year T+1, thus better aligning with the research setting regarding predictive ability.

4.2.2 Explanatory Variables

This paper extracts text features from MD&A texts across three dimensions: tone, forward-looking perspective, and readability.

(1) Tone features are measured using the Net Positive Tone Index (TONE). This paper uses a dictionary matching method to measure the tone of management in listed companies' annual report MD&A texts. The dictionary matching method has advantages such as intuitiveness, strong operability, transparent results, and high repeatability, and is therefore widely used in financial accounting text research [3, 19]. Based on this, this paper draws on existing research on the measurement of management tone and uses the “bag-of-words” method for sentiment recognition in MD&A texts.

Specifically, this paper first preprocesses the MD&A texts by deleting non-Chinese characters, numbers, and irrelevant punctuation, retaining only valid Chinese text; then, it uses Python's jieba word segmentation tool to automatically segment the text. Based on this, positive and negative sentiment words in the text are identified according to the Chinese financial sentiment dictionary, and their occurrence frequency is counted, denoted as POSPCT and NEGPCT respectively. Following the construction approach of net tone indicators such as Loughran and McDonald (2011) and Henry (2008), this paper defines management tone as:

$$TONE = \frac{(POSPCT - NEGPCT)}{(POSPCT + NEGPCT)}$$

Where POSPCT represents the number of positive sentiment words appearing in the MD&A text, and NEGPCT represents the number of negative sentiment words appearing. A larger TONE indicates more positive words than negative words in the text, and a more positive tone in management disclosure; a smaller TONE indicates more negative expressions, and a more cautious or negative tone in management. If no positive or negative sentiment words are identified in a text, i.e., $POSPCT + NEGPCT = 0$, then according to the procedure set in this paper, the TONE of that sample is recorded as 0 [3, 4].

Unlike some studies that first construct the proportions of positive and negative words and then calculate net tone, this paper directly uses the frequencies of positive and negative words to construct a net tone index. However, its basic idea remains consistent with existing research, aiming to characterize the overall sentiment tendency in management's textual disclosures.

(2) This paper uses a dictionary matching method to measure the degree of forward-looking information disclosure in the MD&A texts of listed companies' annual reports. Drawing on existing research on the identification of forward-looking information, forward-looking information is mainly reflected in management's statements regarding the company's future business plans, development goals, strategic layout, performance expectations, and subsequent action arrangements [9-11].

First, the MD&A text is preprocessed, and then the text is segmented into sentences according to periods, semicolons, exclamation marks, and question marks. Regarding the construction of the forward-looking dictionary, this paper refers to the forward-looking vocabulary lists in existing research and, combined with the actual expression methods of Chinese annual report texts, selects words such as “expected,” “hopeful,” “plan,” “goal,” “future,” “will,” “planning,” “layout,” “strive for,” “seek,” and “expand” as forward-looking keywords [11-13]. If a sentence contains at least one forward-looking keyword, then the sentence is identified as a forward-looking sentence.

Ultimately, this paper uses the proportion of forward-looking sentences to the total number of sentences to measure the forward-looking nature of the text, calculated as follows:

$$FWD = \frac{\text{ForwardSentence}}{\text{TotalSentence}}$$

Where ForwardSentence represents the number of sentences in the MD&A text containing forward-looking keywords, and TotalSentence represents the total number of sentences in the text. A higher FWD value indicates that management has disclosed more future-oriented information in the MD&A, and the text is more forward-looking. Unlike some studies that use the proportion of forward-looking word frequency to the total word frequency, this paper uses sentences rather than word frequency as the identification unit, thus more closely reflecting the semantic expression of forward-looking information in the text.

(3) Referring to the research of Li (2008), You and Zhang (2009), and Miller (2010) on the relationship between annual report text length and information processing costs, this paper uses MD&A text length to measure its readability [14-16]. Existing research shows that the longer the text, the higher the cognitive and processing costs investors incur in the process of information search, reading, and understanding. Therefore, text length can serve as an important proxy variable for report readability or complexity.

This paper first statistically cleans the MD&A text to obtain the total word count, and then uses its natural logarithm to construct a readability index as follows:

$$LENGTH = \ln NChars$$

Where NChars represents the total word count of the MD&A text after cleaning. A larger LENGTH value indicates a longer text, higher information processing costs, and weaker readability.

4.2.3 Control Variables

Regarding control variables, this paper references existing research and incorporates factors such as corporate financial characteristics, governance characteristics, and market characteristics. Financial characteristic variables include Return on Assets (ROA), Company Size (SIZE), Debt-to-Equity Ratio (LEV), Operating Cash Flow (CFO), and Revenue Growth Rate (GROWTH); governance characteristic variables include the percentage of shares held by senior executives (MANTOP), the percentage of independent directors (INDP), and the percentage of shares held by the largest shareholder (SHRCR1); the market characteristic variable is the company's market capitalization (MSIZE). Simultaneously, individual fixed effects and time fixed effects are controlled.

4.3 Model Specification

To examine the impact of management tone, forward-looking information, and text readability on future corporate performance, this paper constructs the following two-way fixed-effects panel regression model:

$$ROE_{i,t+1} = \alpha + \beta_1 TONE_{i,t} + \beta_2 FWD_{i,t} + \beta_3 LENGTH_{i,t} + \sum \beta Contrals_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t}$$

Where i represents the company, t represents the year, $ROE_{(i,t+1)}$ is the company's return on net assets in the next period, used to measure the company's future performance; $TONE_{i,t}$, $FWD_{i,t}$, and $LENGTH_{i,t}$ represent management's net optimistic tone, forward-looking information, and text readability, respectively; $\sum \beta Contrals_{i,t}$ to control for variables, we consider firm profitability, company size, capital structure, operating cash flow, growth potential, governance structure, and market value characteristics. μ_i represents the individual fixed effect, λ_t represents the time fixed effect, and $\varepsilon_{i,t}$ is the random disturbance term.

This paper uses Panel OLS for estimation, controlling for firm and year fixed effects. Furthermore, cluster robustness standard error processing is applied at the firm level to mitigate the impact of heteroscedasticity and serial correlation on the estimation results.

5. Empirical Results and Analysis

5.1 Descriptive Statistics

Table 2 presents the descriptive statistics for the main variables. The explained variable, $ROE_{t1_{i,t}}$, has a mean of 0.03, a median of 0.059, a standard deviation of 2.184, a maximum value of 281.989, and a minimum value of -142.168. It can be seen that the sample companies' future performance exhibits high dispersion, with a significant difference between the maximum and minimum values, indicating strong differentiation in future operating results. This characteristic suggests that the information in annual reports may indeed provide an explanatory space for differences in future operations.

From the core explanatory variable, Net Optimistic Tone of Management (TONE), its mean is 0.630, a median of 0.647, a standard deviation of 0.125, a maximum value of 0.940, and a minimum value of -0.289. The mean and median are relatively close, indicating that the overall distribution of this variable is relatively stable. However, there is still a significant difference between the maximum and minimum values, reflecting significant differences in the information expression styles of the companies. From the perspective of forward-looking information (FWD), the mean is 0.232, the median is 0.227, the standard deviation is 0.069, the maximum is 0.630, and the minimum is 0. A minimum of 0 indicates that some companies disclose almost no forward-looking information, or their texts contain very limited forward-looking expressions; while a maximum of 0.630 indicates that some companies also used a significant proportion of statements involving future plans, expectations, and outlooks in their annual reports. From the perspective of text length (LENGTH), the mean is 74.542, the median is 72.998, the standard deviation is 14.801, the maximum is 288.983, and the minimum is 20.319. The large range of values indicates significant differences in the length of annual report texts among different companies.

Table 2: Descriptive Statistics

Variable	Maximum	Minimum	Mean	Median	Standard Deviation
ROE_t1	281.989	-142.168	0.03	0.059	2.184
TONE	0.94	-0.289	0.63	0.647	0.125
FWD	0.63	0	0.232	0.227	0.069
LENGTH	288.983	20.319	74.542	72.998	14.801

5.2 Benchmark Regression

Table 3 reports the benchmark regression results. After controlling for individual and year fixed effects, all three core text variables reached statistical significance.

Management's net optimistic tone (TONE) was significantly positive at the 1% level, indicating that the more positive and optimistic the statements used by management in the annual report, the better the company's future performance. This suggests that tone information reflects management's true expectations for the company's future operating conditions and thus has a certain informational function, this result validates hypothesis 1.

Forward-looking information (FWD) was significantly negative at the 1% level, indicating that the more forward-looking statements a company discloses, the lower its future performance tends to be. This suggests that forward-looking information does not necessarily represent a better development prospect; in some cases, it may be a narrative method used by companies to guide and mitigate market expectations when they are under pressure in current operations and face significant future uncertainty, such result validates hypothesis 2.

Text length was significantly positive at the 5% level, indicating that longer annual report texts usually correspond to more comprehensive information disclosure, helping external investors to understand the company's situation more fully, thus showing a positive correlation with improved future performance, the result validates hypothesis 3.

Table 3: Benchmark Regression Results

Variables	(1)
	ROE t1
TONE	0.0575*** (7.07)
FWD	-0.0422*** (-3.03)
LENGTH	0.0001** (1.98)
Sample Size	32040
adj. R ²	0.1078

*Note: *p<0.10, **p<0.05, ***p<0.01; the values in parentheses are the t-values of robust standard error estimates.*

5.3 Robustness Test

Table 3 reports the robustness test results. After removing the sample from the 2020 pandemic period in column (1), the coefficient of TONE remains significantly positive, FWD remains significantly negative, and LENGTH remains significantly positive, and the direction of the coefficients is consistent with the benchmark regression, indicating that the conclusions of this paper are not driven by the special external shock of the pandemic. The positive predictive effect of management's optimistic tone on future corporate performance, the negative effect of forward-looking statements, and the positive effect of text length all exhibit strong period stability and are not merely temporary phenomena in specific years.

After replacing the explanatory variable in column (2) with lagged ROA_t1_{i,t}, the signs and significance of the three core variables remained essentially unchanged, indicating that the research conclusions do not depend on the specific measurement method of future performance and possess good robustness. This further illustrates that the textual characteristics of annual reports do not reflect a random relationship on a single financial indicator, but rather a relatively stable correlation with the company's future operating performance.

The robustness test results support the main conclusions of the benchmark regression, demonstrating the strong credibility of this paper's judgment on the impact of textual characteristics on future corporate performance.

Table 4: Robustness Test Results

Variables	(1)	(2)
	ROE t1(no 2020)	ROA t1
TONE	0.061*** (7.1279)	0.0246*** (6.476)
FWD	-0.0449*** (-3.0814)	-0.0223*** (-3.386)
LENGTH	0.0002** (2.1223)	0.0001** (2.5026)
Control Variables	Yes	Yes
Individual Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Sample Size	28424	32040
adj. R ²	0.108	0.1437

*Note: **p<0.05, ***p<0.01; the values in parentheses are the t-values for robust standard error estimation.*

5.4 Key Findings

This paper uses A-share listed companies in Shanghai and Shenzhen from 2013 to 2023 as its research sample. Based on the Management Discussion and Analysis (MD&A) texts in annual reports, it examines the predictive effects of management's net optimistic tone, forward-looking information, and text length on the company's future profitability. The results show that MD&A text features have strong information content. Specifically, net positive tone and text length are significantly positively correlated with the company's future profitability, indicating that the positive attitude conveyed by management and more comprehensive information disclosure in the annual report can, to some extent, reflect a better future operating performance. Conversely, forward-looking information is significantly negatively correlated with future profitability, suggesting that disclosing more future plans and expectations does not necessarily mean a better operating prospect; rather, it may reflect higher uncertainty or operating pressure currently faced by the company.

6. Discussion

6.1 Implications

The above conclusions indicate that narrative information in annual reports is not simply a supplement to financial data but has independent informational value. For investors, when analyzing a company's future prospects, they should not only focus on financial indicators but also make a comprehensive judgment based on the tone, information richness, and forward-looking statements in the MD&A text, especially maintaining a cautious attitude towards overly optimistic or excessively forward-looking descriptions. For listed companies, the quality of MD&A information disclosure should be further improved, enhancing the relevance, authenticity, and verifiability of the content, and avoiding vague statements and formalistic disclosures. For regulatory authorities, the existing system can be further improved to refine the normative requirements for narrative information disclosure in annual reports, guiding listed companies to enhance the transparency and effectiveness of textual information.

6.2 Research Limitations and Future Research Directions

This paper still has certain limitations. First, the measurement of textual features is mainly based on dictionary methods and textual statistical methods, which, while highly operational, may still be insufficient to fully capture the deeper meanings of management's expressions in the Chinese context. Second, this paper mainly examines the impact of MD&A textual features on future profitability, with relatively insufficient attention paid to longer-term performance and differences between companies in different industries and with different ownership structures. Future research could further introduce more refined textual analysis methods such as machine learning, expand the measurement indicators of profitability and market performance, and conduct more in-depth comparative analysis in conjunction with corporate heterogeneity to further enhance the understanding of the value of annual report textual information.

7. Conclusion

This paper's empirical results demonstrate that MD&A texts possess significant incremental information value and can effectively reflect a company's future business development trends. Specifically, net positive tone and text length show a significant positive predictive effect on a company's future profitability, while forward-looking information disclosure is significantly negatively correlated with future profitability. Further research confirms that narrative text disclosure in annual reports can overcome the information limitations of traditional financial data, providing supplementary information support for accurately assessing a company's future operating performance. This study, based on the context of Chinese financial texts, verifies the information effectiveness of management discussion and analysis text features, enriches the relevant research results on corporate information disclosure and profitability prediction, and provides reliable empirical reference and evidence for standardizing listed companies' textual information disclosure behavior and optimizing the capital market information disclosure system.

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Conflicts of Interest

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