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The Interaction Between Managerial Tone and Investor Sentiment in Shaping Stock Price Informativeness: Evidence from China's A-Share Market

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Abstract. Managerial tone and investor sentiment are two informational forces that may reinforce or offset each other in capital markets. Signaling theory suggests that managerial tone conveys firm-specific information as a textual soft signal, while behavioral finance suggests that investor sentiment affects the information content of stock prices by shaping how efficiently investors process information. Whether these two forces are complementary or substitutive in determining stock price informativeness, however, remains unclear. Using a sample of 30 Chinese A-share listed firms from 2018 to 2025, this study constructs a managerial tone measure from annual reports and uses turnover rate as a proxy for investor sentiment. Panel fixed-effects models are used to estimate their individual and interactive associations with stock price synchronicity. Managerial tone is negatively but not significantly associated with synchronicity when examined separately, whereas the interaction between tone and sentiment is significantly positive. This result suggests a substitutive relationship: the synchronicity-reducing association of tone weakens in high-attention environments. The findings indicate that the information conveyed by managerial tone depends on market attention and provide evidence on asset pricing in environments with multiple information sources.

Keywords: managerial tone, investor sentiment, stock price synchronicity, information efficiency, interaction effect

1. Introduction

In capital markets, the flow of information from informed to uninformed parties is a central question in finance. Classical signaling theory holds that managers convey information about firm value through structured disclosures, such as financial reports and earnings announcements, which investors then use in pricing decisions. Recent advances in behavioral finance and natural language processing, however, show that corporate information is not limited to numerical data. Managers' language and emotional tone in annual reports and earnings calls may also convey incremental information as textual soft signals. At the same time, not all disclosure-related events produce significant market reactions. Muspa [1] finds no significant price change around annual report award

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announcements, which suggests that the market reaction to disclosure depends on the type of information being released.

Language is not only the carrier of numbers, but also can convey deep information - this concept has a deep foundation in economics. Early research on "cheap talk" shows that even if there is no cost for information transmission, as long as the interests of the sender and the receiver are consistent, language can still effectively influence decision-making. However, in the reality of corporate information disclosure, the goals of management and investors may not always fit together. Although the management will use language to convey real information, it is also possible to use language to deliberately beautify the company's performance. It is this inherent tension that makes the "information value of tone" a problem that needs to be tested empirically, rather than a theoretical inevitable conclusion. This also means that the actual effect of the tone is highly dependent on the information environment in which it is located. When investors can obtain a large amount of information from other channels, the marginal value of tone is often limited; on the contrary, in situations where information is relatively scarce, tone may play a greater role. Based on this logic, this article introduces market attention as a core regulating factor to carry out research.

This phenomenon leads to a key question: when the management's tone affects asset pricing, will the market attention change the transmission mechanism of the signal? At the same time, investor sentiment is another core factor affecting pricing efficiency. High market attention and active trading behaviour will change the way investors process information, thus determining the degree to which the company's characteristic information is integrated into the stock price. It can be seen that there are two forces in the capital market at the same time: the management tone in corporate disclosure, and the investor's attention mapped by trading activities. Do these two forces reinforce each other or counteract each other? This is not only directly related to the information content and pricing efficiency of the stock price, but also a blank point that has not yet given a clear answer in existing studies.

The existing research mainly provides two interpretation perspectives, but both of them have certain limitations. Signal theory believes that the management tone can convey the company's characteristic information, thus alleviating information asymmetry [2-4]; however, the theory usually assumes that the transmission of signals is not disturbed by the market environment, thus ignoring the reality that investors' attention is limited. Behavioural finance points out that investor emotions can change the information content of stock prices by affecting the efficiency of information processing [5-7]; however, such studies often regard emotions as independent factors and do not deeply examine the interaction between them and the company's official disclosures. Relevant empirical evidence supports both views. For example, Guan et al. [8] found that the difference in the tone of executives is associated with a higher risk of stock price collapse, which indicates that the tone does contain information related to extreme price fluctuations. In addition, Jia [9] also reveals a nonlinear relationship between negative public sentiment and stock price fluctuations.Kombate and Huang [10] find that optimistic investor sentiment predicts future stock price crashes.

In order to break through the above limitations, this study introduces the perspective of "information crowding". Due to the limited information processing capacity of investors, the marginal value of new information sources tends to decrease when an information channel is already in a highly active state. In a highly concerned market environment, frequent trading activities have prompted stock prices to absorb a wider range of information, which will weaken the marginal contribution of the management's tone to a certain extent. On the contrary, in a low-level environment, tone may become one of the few sources of information on company characteristics,

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so its marginal utility in the pricing process may be more significant. Based on the above logic, this article tries to answer three key questions: First, can the management tone independently reduce the stock price synchronisation? Second, will investors' emotions regulate the marginal impact of tone on synchronisation? Third, if there is an interaction between the two, is this role complementary or substitute?

This study has made three contributions at the theoretical level. First, it integrates the tone of management and investor sentiment into a unified interactive analysis framework, breaking through the limitation of the previous literature that separates various information sources for separate research. Second, it introduces the perspective of "information crowding" to explain the possible alternative relationship between tone and emotion, thus providing a new analytical idea for asset pricing in a multi-information source environment. Third, it integrates the two types of evidence of "emotional transmission company characteristic information [5]" and "tone contains incremental information [4]", which deeply reveals that the marginal contribution between different information sources often depends on the activity of the other party.

This research is also of great practical significance. When interpreting the tone of management, investors should combine it with market attention for comprehensive consideration: because in a low-attention environment, the information conveyed by the tone is often more valuable, while in a high-attention environment, its information value may be diluted. For listed companies with low market attention, focussing on improving the quality of text disclosure may bring greater marginal benefits; on the contrary, high-profile companies that have attracted much attention from the market should focus on the disclosure of substantive information, rather than just staying at the level of tone management. In addition, regulators should also be aware that the marginal benefits of information disclosure requirements may fluctuate with changes in market attention. For listed companies that have long been in low attention but have an unusually positive text tone, they should be focussed on and specially monitored to prevent potential information manipulation risks.

2. Research method

2.1. Method selection, data sources, and sample

The empirical analysis in this paper is based on a firm-year panel to assess how managerial tone and investor sentiment relate to stock price synchronicity, both separately and jointly. An event-study design is not used because the effects of tone and sentiment on information efficiency are expected to unfold over an annual horizon rather than as short-term responses to a discrete event. Firm fixed effects absorb these characteristics, so identification is based primarily on within-firm changes in tone over time. This approach is widely used in research on disclosure and asset pricing [5, 6]. An interaction term is included to test whether tone and sentiment are complementary or substitutive. An event-study design is not used because the effects of tone and sentiment on information efficiency are expected to unfold over an annual horizon rather than as short-term responses to a discrete event. Event studies are better suited to measuring immediate market reactions around disclosure dates [11] and therefore do not match the theoretical focus of this study.

Tone data come from the annual reports of A-share listed firms. The Management Discussion and Analysis section provides concentrated managerial commentary, offers sufficient text for analysis, and grants managers considerable discretion over tone, which makes it appropriate for tone measurement [3, 4]. The annual reports are downloaded from CNINFO, and the extraction procedures are documented to support reproducibility.

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Investor sentiment is proxied by turnover rate, which reflects trading activity and market attention and is widely used in the behavioral finance literature. Market and financial data are obtained from publicly available East Money data interfaces.

The sample covers 2018–2025 and includes 30 A-share listed firms. Three types of firms are removed from the sample. Financial firms are dropped because their balance sheets differ fundamentally from those of industrial firms. ST firms and newly listed firms are also removed, since their trading environments are atypical and may distort how firm-specific information enters prices.

2.2. Variable definitions and model specification

• Dependent variable: Stock price synchronicity (SYNCH). Stock price synchronicity reflects the degree to which a stock's returns co-move with overall market movements. This study adopts the standard method established in the previous literature to calculate the index. Specifically, we return the daily stock yield of each listed company in each year to the daily market yield, so as to obtain the decision coefficient (R-squared). The higher the R square value, the greater the explanation of the overall fluctuation of the market to the price changes of individual shares, which means that the less space is left for the company's characteristic information to integrate into the stock price. Therefore, we interpret higher stock price synchronisation as lower information efficiency：

$$SYNCH = ln(\frac{R^2}{1-R^2}) \tag{1}$$

Higher synchronisation value represents stronger stock price synchronisation and lower information efficiency. This indicator has been widely used in past research on investor sentiment and synchronisation [5]; at the same time, in the analytical framework of exploring sentiment, synchronisation and market collapse risk, this indicator has also been introduced as an intermediary variable [4, 6]. The above-mentioned existing research provides a solid methodological precedent for this study to adopt this indicator.

• First core explanatory variable: managerial tone (TONE). The measurement data of tone in this study comes from the "Management Discussion and Analysis" (MD&A) section of the annual report. Since this part is written by the management himself, it can directly reflect its assessment and judgement of the company's current performance and future development prospects. In order to quantify the tone of this text, we count the positive and negative words in the text with the help of the Chinese financial sentiment dictionary, and calculate the net positive tone according to the following formula::

$$TONE = \frac{Positive - Negative}{Positive + Negative} \tag{2}$$

The value interval of TONE is [−1, 1], and the value is positive, which means that the overall tone of the management is positive. Specifically, we divide the difference between the number of positive and negative words by the sum of the two. This standardised treatment not only enables the construction of indicators, but also ensures the comparability between texts of different lengths. The

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dictionary-based tone measurement method has been widely used in existing literature. For example, Zhang and Wu used the same net positive tone calculation formula [3] when studying the "Management Discussion and Analysis (MD&A)" section of the annual report. In addition, some past studies have also stripped the normal tone components and residual (i.e. abnormal) components determined by the fundamentals of the company. In view of the fact that the focus of this study is to examine the overall signal effect of tone, we finally used the unstripped net tone primitive indicator. Finally, in order to reduce the measurement noise caused by the small number of emotional words, we eliminated the sample observation of tone as extreme value (-1 or 1) in the regression analysis..

• Second core explanatory variable: investor sentiment (SENT). This study adopts the change of hands (TURN) as a proxy indicator of investor sentiment, which can effectively reflect the trading activity of the market and the level of attention of investors. Generally speaking, the higher the changeover rate, the higher the investor's attention and the stronger the market sentiment. Although the change of hands itself cannot capture the direction of emotions (i.e. whether it is optimistic or pessimistic), it is still a widely accepted emotional agent variable in the existing literature in the field of behavioural finance.

• Interaction term (TONE×SENT). This interaction aims to test whether investor sentiment will regulate the relationship between management tone and stock price synchronisation. If the interaction coefficient is negative, it indicates that the two are complementary, because a higher emotional level will strengthen the negative correlation between tone and synchronization; on the contrary, if the coefficient is positive, it means that there is a substitute relationship between the two, because a higher emotional level will weaken this negative correlation.

• Control variables. Two control variables are included in the model in this study, because the literature has shown that they are closely related to the synchronisation of stock prices. Among them, the first control variable is the asset-liability ratio (leverage ratio), which is measured by total liabilities divided by total assets; the second control variable is the return on net assets (ROE), which is measured by net profit divided by net assets. These financial characteristics may affect the degree to which the company's characteristic information is integrated into the stock price to a certain extent [4-6].

2.3. Model specification

The baseline specification is a two-way fixed-effects panel model:

$$SYNCH_{\{i,t\}} = \alpha + \beta_1 TONE_{\{i,t\}} + \gamma Controls_{\{i,t\}} + \mu_i + \lambda_t + \varepsilon_{\{i,t\}} \quad (3)$$

$$SYNCH_{\{i,t\}} = \alpha + \beta_1 SENT_{\{i,t\}} + \gamma Controls_{\{i,t\}} + \mu_i + \lambda_t + \varepsilon_{\{i,t\}} \quad (4)$$

In this setting, μi represents the fixed effect of the company, which is used to absorb those company characteristics (such as corporate culture or governance practises) that cannot be directly observed and do not change with time. The year fixed effect (λt) is used to control the common macro impact faced by all companies in the same year. In addition, we have clustered standard errors at the company level to allow sequence correlation between different observations of the same company.

The interaction specification adds the product of TONE and SENT to the baseline model:

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$$SYNCH_{\{i,t\}} = \alpha + \beta_1 TONE_{\{i,t\}} + \beta_2 SENT_{\{i,t\}} + \beta_{3(TONE_{\{i,t\}} \times SENT_{\{i,t\}})} \quad (5)$$
$$+\gamma Controls_{\{i,t\}} + \mu_i + \lambda_t + \varepsilon_{\{i,t\}}$$

If β3 is significantly negative, it means that there is a complementary relationship between the two, because a higher emotional level will further strengthen the negative correlation between tone and synchrony; on the contrary, if β3 is significantly positive, it indicates that the two have a substitute relationship, because a higher emotional level will weaken this negative correlation. Previous studies on the synchronisation of investor sentiment and stock prices have also adopted similar interactive item settings [5].

2.4. Descriptive statistics

Table 1 reports the descriptive statistical results of the main variables. Among them, the average value of stock price synchronisation (SYNCH) is −0.848, and the standard deviation is 0.724, which indicates that there is a significant difference in the stock price information content of the sample company. The distribution characteristics of the above variables are basically consistent with the results of previous studies on the synchronisation of investor sentiment and stock prices [5, 6]. The mean value of TONE is −0.457. The negative average likely reflects the coverage of the sentiment dictionary rather than the actual tone of the reports, since the dictionary may classify certain neutral expressions as negative in a financial context.

Table 1. Descriptive statistics for the main variables

Variable	Observations	Mean	Std. Dev.	Min	Median	Max
SYNCH	210	-0.848	0.724	-3.370	-0.784	0.490
TONE	210	-0.457	0.433	-1.000	-0.500	1.000
SENT	210	0.028	0.009	0.009	0.028	0.078
LEV	210	0.519	0.196	0.092	0.545	0.930
ROE	210	0.105	0.165	-1.394	0.109	0.404

Note: All continuous variables are trimmed at the 1st and 99th percentiles. SYNCH = stock price synchronicity; TONE = managerial net tone; SENT = investor sentiment (turnover rate proxy); LEV = leverage; ROE = return on equity.

3. Empirical results

3.1. Baseline regression results

Table 2 presents the baseline regression results. Column (1) shows that the coefficient on TONE is −0.134 and not statistically significant (p = 0.562). The negative sign is in the expected direction, but the estimate does not offer statistically significant evidence of an association between more positive tone and lower synchronicity. Column (2) shows that the coefficient on SENT is −5.621 and also not statistically significant (p = 0.483). Considered together, the two baseline specifications do not reveal statistically discernible individual associations between tone or sentiment and synchronicity in this sample.

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Table 2. Managerial tone, investor sentiment, and stock price synchronicity: baseline regressions

Variable	(1) SYNCH	(2) SYNCH
TONE	-0.134 (-0.58)	
SENT		-5.621 (-0.70)
LEV	Control	Control
ROE	Control	Control
Firm FE	Yes	Yes
Year FE	Yes	Yes
N	167	167
R^2	0.606	0.605

Note: Asterisks indicate significance levels, with ***, **, and * corresponding to the 1%, 5%, and 10% levels, respectively, while t-statistics appear in parentheses and standard errors are clustered at the firm level.

3.2. Interaction effect regression results

Table 3, column (3) reports a TONE coefficient of −1.255, which is statistically significant at the 5% level ($p = 0.033$), while the coefficient on TONE × SENT is 43.541 and also significant at the 5% level ($p = 0.018$). The positive interaction coefficient is consistent with a substitutive relationship between managerial tone and investor sentiment: as investor sentiment or attention increases, the negative association between tone and synchronicity weakens. Conversely, the association is stronger when sentiment is low.

Table 3. Interaction between managerial tone and investor sentiment

Variable	(3) SYNCH
TONE	-1.255** (-2.13)
SENT	10.179 (1.03)
TONE×SENT	43.541** (2.37)
LEV	Control
ROE	Control
Firm FE	Yes
Year FE	Yes
N	167
R^2	0.628

Note: Significance levels are indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Values in parentheses are t-statistics. Standard errors account for clustering at the firm level. Column (3) excludes observations with extreme TONE values.

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4. Discussion

The study's central finding is a significant positive interaction between managerial tone and investor sentiment, consistent with a substitutive relationship. An information-crowding mechanism may explain this result. Investors have limited information-processing capacity. When a stock receives substantial market attention and trading is active, its price may already reflect a broader set of information, reducing the marginal contribution of managerial tone. By contrast, in low-attention environments, managerial tone may be one of the few available sources of firm-specific information and may therefore have a stronger association with pricing. This interpretation is related to the mechanism proposed by Zhao and Li, in which sentiment affects crash risk through synchronicity [6]. The present study extends that reasoning by suggesting that market attention may condition the informativeness of managerial tone.

From a more macro level, this alternative interaction shows that the marginal contribution of each information source depends on the level of market attention. The findings of this study incorporate the two types of evidence of "emotional transmission company characteristic information [5]" and "management tone contains incremental information [4]" into a unified interpretation framework. In addition, Bi [12] research based on China's industry panel data shows that investor sentiment affects the risk of market collapse by affecting the synchronisation of stock prices, which further confirms the close relationship between sentiment and information efficiency. Information sources do not operate independently: when one of the channels is highly active, the marginal contribution of the other channel tends to decrease. This explanation provides a reasonable research perspective for the asset pricing mechanism in a multi-information source environment.

5. Conclusions and policy recommendations

5.1. Conclusions

This study draws on data from 30 A-share listed firms in China over the period 2018 to 2025. A managerial tone measure is constructed from annual report "Management Discussion and Analysis" texts. Turnover rate is used to proxy for investor sentiment. Three panel fixed-effects regressions are estimated. The main conclusions are as follows.

First, the estimated individual relationship between managerial tone and stock price synchronicity is negative but not statistically significant. Table 2, column (1) reports a coefficient of −0.134 for TONE, with a p-value of 0.562. The negative sign matches our expectation that positive tone lowers synchronicity. However, the estimate cannot reject the null. Tone alone, therefore, does not explain synchronicity in this sample.

Second, the estimated individual relationship between investor sentiment and stock price synchronicity is also not statistically significant. Table 2, column (2) reports a coefficient of −5.621 for SENT, with a p-value of 0.483. The negative sign implies that higher turnover goes with lower synchronicity, but the estimate cannot be distinguished from zero. Neither baseline regression, taken together, offers significant evidence of a separate link between either information source and synchronicity.

Third, the interaction between managerial tone and investor sentiment is significantly positive, which is consistent with a substitutive relationship. Table 3, column (3) reports a coefficient of 43.541 for TONE × SENT, with a p-value of 0.018, and a coefficient of −1.255 for TONE, with a p-value of 0.033. The positive interaction term indicates that the negative link between tone and

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synchronicity weakens when sentiment is high and strengthens when sentiment is low.Tone's informativeness, in other words, hinges on the level of market attention.

5.2. Policy recommendations

The first finding has implications for listed firms. Firms should not rely on textual tone alone to improve the information content of their disclosures. Because the estimated individual association of tone with synchronicity is statistically insignificant, merely increasing the number of positive words in annual reports is unlikely to improve pricing efficiency. Tone should instead be supported by substantive operating information, risk disclosure, and strategic analysis. Textual signals are most credible when they are grounded in firm fundamentals.

The second finding has implications for investors. Turnover and other trading-activity indicators should not be used alone to assess stock price informativeness. High turnover does not necessarily imply either high or low information efficiency. Investors should evaluate trading activity together with firm fundamentals and other information sources rather than base decisions solely on market activity.

The third finding has implications for both investors and regulators. Investors should interpret tone in conjunction with market attention. For low-attention stocks with inactive trading, annual-report tone may contain greater marginal information and may therefore deserve more weight. For high-attention stocks, the incremental information in tone may be limited, so investors should cross-check it against other sources. In addition, regulators should also recognise that the marginal benefits of information disclosure requirements may fluctuate with changes in market attention. During periods of low market attention, or for those companies that have been neglected with low attention, further strengthening of disclosure standards can often produce more significant marginal improvements. At the same time, for those listed companies that have been in a state of low attention for a long time but whose text tone is unusually positive, the regulatory department should monitor them more closely to prevent their potential opportunistic impression management behaviour.

5.3. Limitations and future research

First of all, the tone measurement of this study relies on a simple emotional dictionary with limited vocabulary coverage, and fails to effectively separate the "normal tone determined by the fundamentals" from the "tone that may be at the discretion of the management". Therefore, this measurement error may weaken the accuracy of the estimated association. Future research can consider using a broader Chinese financial emotional dictionary, or introducing a large language model for more context-sensitive emotional analysis; at the same time, the part of the tone that cannot be explained by the fundamentals can also be extracted separately, so as to more accurately evaluate the connotation and role of its information.

Secondly, although the change of hands rate can reflect the trading activity of the market, it cannot effectively distinguish the direction of investors' emotions (i.e. whether they are optimistic or pessimistic). In addition, this study contains only a small sample of 30 companies, which also limits the statistical testability and the universality of the research conclusions to a certain extent. Future research can try to extract post data from investor forums to construct directional emotional indicators; at the same time, the scope of the sample can also be further expanded to a wider market or a longer time span. These improvement measures will help improve the statistical testing power and external validity.

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