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Title： Risk information disclosure effect on IPO pricing efficiency: Evidence from China

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ABSTRACT

This study proposes a novel method to measure idiosyncratic risk disclosure: text similarity, using a pretrained model. The study explores the impact of risk information disclosure on initial public offering (IPO) pricing efficiency. Based on 2,305 prospectuses of Chinese IPOs from 2007 to 2021, we find that risk information disclosure positively affects IPO price-to-earnings and negatively affects IPO underpricing. The mechanism reveals that risk information disclosure reduces information asymmetry and decreases investors' heterogeneous beliefs, which elevates IPO pricing efficiency. Notably, the impact is more pronounced for IPOs with lower underwriter and audit reputations. Furthermore, higher risk disclosure quality is associated with better long-term market performance. Finally, registration system reform improves IPO price-to-earnings, significantly reducing IPO underpricing. These findings underscore the importance of advanced risk disclosure for fostering an efficient and orderly capital market.

Keywords: Prospectus; Risk information disclosure; Price-to-Earnings Ratio; IPO underpricing

1. Introduction

With the increasing significance of information disclosure, there has been a remarkable expansion of theoretical and empirical research on risk information disclosure in recent years (Khandelwal et al., 2019; Li et al., 2019; Guo et al., 2022; Brockman et al., 2023). Risk information disclosure can be regarded as a process involving the generation, transmission, and interpretation of information. The disclosure of risk information is an essential means for issuers to disclose significant risks based on their unique characteristics, transmit information to external investors, and mitigate information asymmetry. Indeed, the quality of risk information disclosure directly impacts the effective functioning of the capital market. A historical review indicates that violations of information disclosure have been recurrent. Such events range from the false information disclosure case of Yin Guangxia (000557) to the fraudulent issuance case by Huachen Group (600609) and the massive financial fraud case perpetrated by Luckin Coffee. Such illegal activities by numerous listed companies contravene the principles of comprehensive, timely, accurate, and truthful information disclosure, profoundly damaging investor confidence and impairing the operational efficiency of capital markets.

Determining the issue price is the most critical aspect of the initial public offering (IPO) process for a listed company. Therefore, the valuation and pricing issues of new stocks have long been the focus of attention for the government, practitioners, and academia. In the Chinese market, the phenomenon of a high IPO price–earnings ratio, high share issue prices, and large amounts of funds is prevalent. The phenomenon of significant underpricing in IPOs has persistently existed in the A-share market, with underpricing rates most commonly exceeding 100%. This indicates a substantial pricing bubble in the determination of IPO prices, far surpassing those observed in mature capital markets. The process of IPOs is characterized by inherent information asymmetry, leading to uncertainty in determining the valuation of a listed company. Thus, information friction engenders

divergent perspectives among market participants, ultimately culminating in substantial underpricing of IPOs and the proliferation of speculative practices, including IPO flipping and arbitrage. Therefore, the soundness of the information disclosure mechanism is a necessary path for China to transition to a mature and effective capital market, such as markets in developed countries. Effective information disclosure acts as a lubricant between issuers and market participants, playing a pivotal role in eliminating the shackles of information asymmetry and promoting the effective operation of the securities market's price discovery mechanism.

Previous research has investigated the impact of risk information disclosure from multiple perspectives, such as text readability (Beatty and Ritter, 1986; Arnold et al., 2010; Li et al., 2023) and text tone (Wu et al., 2021; Ayuningtyas and Harymawan, 2022). However, there is significant theoretical disagreement regarding the economic consequences of risk disclosure. On the one hand, effective information disclosure can mitigate information asymmetry, decrease investor costs for obtaining information, enhance the accuracy of analyst forecasts (Hope et al., 2016), and reduce the underpricing compensation demanded by investors for IPOs, thus improving the efficiency of financial resource allocation. On the other hand, the disclosure of essentially negative risk information signifies greater uncertainty for the listed company, potentially exacerbating market panic (Yang et al., 2022), intensifying investor opinion divergence, and leading to an overvaluation of stock prices (Miller, 1977). Therefore, risk factor disclosure possesses the dual characteristics of being "risk information" with its specificity and "public information" with its generality. Revealing risk factors equates to opening the "black box," exposing potential threats to the company while providing incremental information.

Under the backdrop of a registration-based system, stricter regulations and an improved information environment in China have elevated standards for risk information disclosure. A relevant issue is to explore how the risk information disclosure level changes, what governance effects it has on market operations, and how stakeholders react. Based on the above analysis, we have reason to believe that there exists a close relationship between risk information disclosure and IPO pricing efficiency. Exploring this issue is of practical significance for risk information providers, users, and regulators and has relevant policy implications for optimizing the information pricing efficiency of the capital market.

We conducted our study in China for two reasons. First, China's IPO market is significantly representative. This market has rapidly grown to be the second largest, surpassing other major global capital markets in both number and financing. Analyzing the operation mechanisms, regulatory policies, and market performance of China's IPO market can provide references for emerging markets to improve their IPO systems. Second, China's IPO systems have undergone multiple reforms, with the capital market rapidly developing. The legal environment and investor composition in China are notably different from those in mature capital markets. The implementation of securities law under the registration-based system has strengthened information disclosure. The secondary market is dominated by individual investors in a speculative environment, offering a chance to study the role of China's institutional and cultural environment in IPO pricing efficiency.

This study constructs a measure of risk information disclosure through text analysis of the prospectus and uses a sample of Chinese A-share listed companies from 2007 to 2021 to investigate the quality of risk information disclosure by IPO companies. Empirical research shows that the higher the quality of risk information disclosure in the prospectus is, the higher the IPO price-to-

earnings ratio is, and the lower the IPO underpricing is. The above conclusion still holds through robustness tests, such as replacing key variables, adding control variables, and using a Heckman two-stage model. In terms of the mechanism, the risk information disclosure reduces information asymmetry and decreases investors' heterogeneous beliefs, which subsequently elevates IPO pricing efficiency. Heterogeneity analysis reveals that the effect of risk information disclosure on IPO pricing efficiency is more significant in groups characterized by lower underwriter reputation and lower audit firm reputation.

Furthermore, expansion research finds that the higher the quality of risk information disclosure is, the better the long-term market performance of listed companies is. Finally, we use the registration-based system as a quasi-natural experiment. It is found that the implementation of the registration-based system reform has increased the IPO price-to-earnings ratio and has significantly reduced IPO underpricings, suggesting that the registration-based system reform has good governance effects.

Our study offers several notable contributions to the literature. First, the study proposes a novel method to measure idiosyncratic risk information by using a pretrained model, ERNIE, which calculates text similarity. This approach improves previous methods that relied on word frequency-based approaches to form word vectors, which are limited in their ability to capture contextual semantic information. By adopting the proposed methodology, the present study provides a more accurate and comprehensive approach to measuring risk information disclosure.

Second, the study advances research on the economic consequences of risk disclosure and IPO pricing. Specifically, we clarify the impact of risk information disclosure on IPO pricing efficiency and its underlying mechanism. We present empirical evidence that supports the core logical mechanisms of "risk information disclosure–information asymmetry–IPO pricing efficiency" and "risk information disclosure–investors' heterogeneous beliefs–IPO pricing efficiency." The findings enhance our understanding of the economic consequences of idiosyncratic risk information disclosure and provide insights into the impact of information disclosure on market efficiency.

Third, the study has practical implications for listed companies, regulatory agencies, and market participants. Empirical analysis reveals a positive governance effect of risk information disclosure on the pricing of new stock issuances in the primary market. The conclusion underscores the importance of improving the quality of information disclosure for listed companies, strengthening the supervision of information for regulatory agencies, and making rational value judgments for investors.

2. Theoretical model construction

Drawing on Arnold et al. (2010), this study establishes a multiperiod pricing model that incorporates IPO risk information disclosure, the primary market issuance price, and the secondary market stock trading equilibrium price. This framework aims to provide a more comprehensive depiction of the influence between risk information disclosure and IPO pricing efficiency. The basic model assumptions and specific derivation process are outlined as follows:

2.1. Model assumptions

2.1.1 Issuance characteristics

The IPOs adopt a book-building issuance system with a total issuance quantity of 1 unit. Underwriters and issuers jointly determine the offline allotment ratio ($0 < \varphi < 1$) and the issuance price through an inquiry with institutional investors.

2.1.2 Participating entities

Market participants are divided into two categories: institutional investors in the primary market and retail investors in the secondary market. Each category of investors is homogeneous and is thus represented by a representative investor. Both institutional and retail investors exhibit risk aversion and adhere to CARA-type utility functions, with risk aversion coefficients denoted as β and γ, respectively.

2.1.3 Temporal division

The model is divided into four periods: (1) Inquiry Stage ($t = 0$): Institutional investors participate in the inquiry, providing feedback on bid and demand information to underwriters based on their own valuations. (2) Issuance Stage ($t = 1$): Underwriters and issuers jointly determine the IPO issuance price p_1 and the total offline allotment ratio φ based on the reported bids. (3) Trading Stage ($t = 2$): New shares are traded for the first time in the secondary market, with an equilibrium trading price set at p_2, representing the IPO's closing price on the first day. (4) Settlement Stage ($t = 3$): New shares are settled based on their intrinsic value. Before the settlement stage, there exists a disparity in the estimation of an IPO's intrinsic value between institutional and retail investors: institutional investors, with keener insights into the company's information, anticipate a settlement based on the intrinsic value $p_3 = V$; whereas retail investors, influenced by irrational emotions, anticipate a settlement based on $p_3 = V' = V + \Delta V$.

2.1.4 Information structure

(1) Inquiry Stage ($t = 0$)

Based on a clear understanding of its own business operations and future prospects, the issuer assumes an unbiased previous estimate $V \sim N(\bar{V}, 1/\rho_v)$ of the IPO's intrinsic value, where $\bar{V}$ denotes the mean of a normal distribution, and $1/\rho_v$ represents the variance. As the prospectus for the IPOs contains valuation information, both institutional and retail investors observe this previous estimate and use it as the initial basis for valuing the IPO.

(2) Issuance Stage ($t = 1$)

Before the IPO subscription, inquiry institutions further explore information about the IPO company out of professional habit, thus possessing private risk information θ about the value V. Inquiry institutions make bids based on the private risk information; the signal structure regarding the value of the IPO company is $S_I = V + \theta$, where $\theta \sim N(0, 1/\rho_\theta)$. Here, θ represents the random error term for S_I, and θ is independent of V. The realized value of the signal is s_I. As institutional investors are averse to uncertainty and possess excellent information recognition capabilities, identifying more complex, low-quality risk information implies higher identification costs. Therefore, the realized signal can be decomposed as $s_I = s_H - s_L$, where s_H represents the valuation level corresponding to high-quality risk signals (financial data information and other nonstandardized information), and s_L represents the discounted portion of the IPO's value due to low-quality risk signals. Therefore, as the quantity of low-quality risk information increases, institutional investors demand higher price compensation, leading to a larger value for the discount

component s_L.

(3) Trading Stage (t = 2)

The IPO company enters secondary market trading; thus, retail investors, influenced by factors such as industry environment, market sentiment, and media coverage, may engage in irrational trading. This leads them to form new perceptions about the IPO's value: $S_R = \Delta V + \eta$, where $\Delta V \sim N(0, 1/\rho_R)$ and $\eta \sim N(0, 1/\rho_\eta)$. The realized value of the emotional signal is s_R. Where s_R is positive, suggesting investor optimism, $\Delta V > 0$ signifies retail investors perceiving the intrinsic value of the IPO company as underestimated. Conversely, when s_R is negative, reflecting investor pessimism, $\Delta V < 0$ implies that retail investors consider the intrinsic value of the IPO company to be overestimated.

2.2. Model derivation

2.2.1 Determination of the primary market IPO price

To ensure the favorable properties of the utility function and the analytical simplicity of the model, it is assumed that the bid information reported by institutional investors forms a continuous demand curve. In period t = 1, the inquiring institution determines its optimal demand for new shares based on the private risk information at its disposal, aiming to maximize its expected utility at period t = 3, as follows:

$$\max_{q_{1I}} E[-e^{-\beta[W_{1I} + q_{1I}(V - p_1)]}] \tag{1}$$

where q_{1I} represents the demand of institutional investors for IPO shares, and W_{1I} denotes the initial wealth of institutional investors. Utilizing the properties of the CARA utility function and the assumption of normal distribution, Model (1) can be equivalently expressed as follows:

$$\max_{q_{1I}} \beta W_{1I} + \beta q_{1I}[E(V|S_I = s_I) - p_1] - \frac{1}{2}\beta^2 q_{1I}^2 var(V|S_I = s_I) \tag{2}$$

where $E(V|S_I = s_I)$ represents the posterior estimate of the intrinsic value of the IPO company formed by institutional investors based on private risk information, and $var(V|S_I = s_I)$ represents the variance of the posterior estimate. According to Kyle's Lemma, by substituting $s_I = s_H - s_L$, we obtain the following:

$$E(V \mid S_I = s_I) = \frac{\rho_v \overline{V} + \rho_\theta s_H - \rho_\theta s_L}{\rho_V + \rho_\theta} \tag{3}$$

$$var(V \mid S_I = s_I) = \frac{1}{\rho_V + \rho_\theta} \tag{4}$$

Substituting Models (3) and (4) into Model (2) and taking the first derivative with respect to q_{1I} and setting the derivative to zero, we obtain the optimal IPO demand of institutional investors as follows:

$$q_{1I}^* = \frac{1}{\beta}(\rho_v \overline{V} + \rho_\theta(s_H - s_L) - (\rho_v + \rho_\theta)p_1) \tag{5}$$

Under the equilibrium condition in the primary market, the quantity of shares allocated to inquiring institutional investors φ equals their demand q_{1I}^*. Thus, the IPO issuance price is as follows:

$$p_1 = \frac{\rho_v \overline{V} + \rho_\theta(s_H - s_L) - \beta\varphi}{\rho_V + \rho_\theta} \tag{6}$$

According to Model (6), the IPO issuance price p_1 is positively correlated with high-quality

risk signals s_H from the prospectus. This implies that as more high-quality risk information is disclosed in the prospectus, institutional investors tend to value the IPO company more highly. Given the conditions of the Chinese IPO market, inquiring institutions typically interpret high-quality risk disclosure as a "positive" signal. The more optimistic the outlook for the IPO's profit expectations, the more investors are willing to pay. Assuming constant earnings per share, the corresponding IPO's price-to-earnings ratio would be higher. Thus, we establish the first empirical proposition of the subsequent study: the quality of risk disclosure in the prospectus is positively correlated with the IPO price-to-earnings ratio, suggesting that a higher quantity of high-quality risk disclosure leads to a higher IPO price-to-earnings ratio.

2.2.1 Determination of the secondary market equilibrium trading price

On the one hand, in period t = 2, institutional investors have not received incremental risk information and consider the emotional impact on retail investors to be temporary. On the other hand, institutional investors holding shares from the offline allocation have a minimum holding period of three months and cannot engage in trading activities on the first day of listing at t = 2. Therefore, institutional investors will not change their posterior estimates, and the IPO demand of institutional investors remains at the level of q_{1I}^*.

In period t = 2, retail investors are able to obtain the private information of institutional investors at t = 1 from the quotes of inquiring institutions. Additionally, retail investors are influenced by subjective emotions and irrational cognition. Retail investors determine their optimal demand for new shares based on the information they have, aiming to maximize their expected utility at t = 3, which is as follows:

$$\max_{q_{2R}} E[-e^{-\gamma[W_{2R} + q_{2R}(V' - p_2)]}] \tag{7}$$

where q_{2R} represents the IPO demand of retail investors at t = 2, and W_{2R} represents the initial wealth of retail investors at t = 2. Model (7) can be equivalently expressed as follows:

$$\max_{q_{2R}} \gamma W_{2R} + \gamma q_{2R}[E(V'|S_I = s_I, S_R = s_R) - p_2] - \frac{1}{2}\gamma^2 q_{2R}^2 var(V'|S_I = s_I, S_R = s_R) \tag{8}$$

Taking the first derivative with respect to q_{2R} in Model (8) and combining it with the posterior estimates and posterior estimate variance of retail investors obtained based on Kyle's Lemma, we obtain the optimal IPO demand of retail investors as follows:

$$q_{2R}^* = \frac{1}{\gamma}\left(\frac{\rho_v \overline{V} + \rho_\theta(s_H - s_L)}{\rho_V + \rho_\theta} + \frac{\rho_\eta s_R}{\rho_R + \rho_\eta} - p_2\right)\frac{(\rho_V + \rho_\theta)(\rho_R + \rho_\eta)}{\rho_V + \rho_\theta + \rho_R + \rho_\eta} \tag{9}$$

Under the equilibrium condition in the secondary market, the total quantity of shares issued in the IPO is equal to the total market demand, i.e., $q_{1I}^* + q_{2R}^* = 1$. This leads to the equilibrium secondary market price as follows:

$$p_2 = \frac{\rho_v \overline{V} + \rho_\theta(s_H - s_L)}{\rho_V + \rho_\theta} + \frac{\rho_\eta s_R}{\rho_R + \rho_\eta} - (1 - \varphi)\gamma\frac{\rho_V + \rho_\theta + \rho_R + \rho_\eta}{(\rho_V + \rho_\theta)(\rho_R + \rho_\eta)} \tag{10}$$

Based on the first-day return formula $UP = \frac{p_2}{p_1} - 1$ and substituting Models (6) and (10), we obtain the first-day return of the IPO as follows:

$$UP = \frac{1}{\rho_R + \rho_\eta}\left[\frac{\beta\varphi(\rho_R + \rho_\eta) + (\rho_v + \rho_\theta)[\rho_\eta s_R - (1 - \varphi)\gamma(\rho_R + \rho_\eta)]}{\rho_v \overline{V} + \rho_\theta(s_H - s_L) - \beta\varphi}\right] \tag{11}$$

Model (11) reveals that the first-day return *UP* is negatively correlated with the high-quality

risk signal s_H from the prospectus. This indicates that as more high-quality risk information is disclosed (i.e., more accurate signals regarding the intrinsic value of the IPO company), the first-day return of the newly listed stock is lower. Thus, we establish the second empirical proposition of the subsequent study: the quality of risk disclosure in the prospectus is negatively correlated with the IPO underpricing rate, meaning that a higher quantity of high-quality risk disclosure leads to a lower IPO underpricing rate on the first day.

3. Research hypotheses

During IPOs, the prospectus is the relevant "resume" that determines whether a company can successfully go public. The risk factor section of the prospectus reflects the self-evaluation of the issuer's key risks, and the level of risk information disclosure directly affects the pricing efficiency of the IPO market. Currently, the rationality of IPO pricing and the efficiency of financial resource allocation in China's IPO market still require improvement. Previous research mainly explains IPO pricing efficiency from three aspects: information asymmetry theory, behavioral finance theory, and market-oriented reforms and institutional changes. However, the relationship between risk information disclosure and IPO pricing efficiency is not clear. Some scholars have supported the positive effect of risk information disclosure on IPO pricing efficiency (Wasiuzzamn et al., 2018). By contrast, other authors have held the completely opposite view that risk information disclosure has a negative effect on IPO pricing efficiency (Campbell et al., 2014). Currently, scholars at home and abroad have not yet formed a consensus.

First, the disclosure of high-quality information mitigates information asymmetry, allowing companies to convey proprietary information effectively. In an asymmetric "Lemon Market," IPO issuers hold a distinct informational advantage over investors, who only receive filtered and processed information. This asymmetry can lead to adverse selection and moral hazard, impacting the efficiency of resource allocation in the securities market. High-quality information disclosure is essential for alleviating this asymmetry, offering a means for price discovery that is vital for the functioning of capital markets (Milgrom, 1981). High-quality risk information disclosure attracts more analyst attention, thus improving forecast accuracy (Lehavy et al., 2011) and aligning new stock prices with their underlying fundamentals. Therefore, issuers can optimize risk information disclosure to alleviate the information asymmetry issue, attract more investors, and obtain lower financing costs to ensure the healthy and orderly operation of the capital market (Ntim et al., 2013).

Second, the disclosure of high-quality information can reduce the divergence in investor opinions and attract investor attention. First, attention is a scarce resource; templated risk information disclosures do not attract investors' attention (Loughran and McDonald, 2023). In a crowded information disclosure environment, investors tend to concentrate their attention on idiosyncratic risk factors that may influence stock prices (Li, 2008). Investors respond more fully to specific and targeted risk information disclosures but find it difficult to make appropriate decisions regarding vague and generalized information disclosures. Furthermore, high-quality risk information disclosure can reduce suspicion and disagreement among market participants, thus easing uncertainty, reducing capital costs, and further enhancing stock prices (Zeng et al., 2006). If the content of risk information fails to meet investors' needs, investors inevitably diverge, affecting their stock investment decisions and valuations (Hong and Stein, 2007). Furthermore, the lower the information content of a prospectus is, the more inconsistent investors' views on asset prices are (Li

et al., 2012), ultimately manifesting as issuers providing corresponding risk compensation to investors and resulting in IPO underpricing. In particular, if risk-averse investors perceive themselves to be in a highly uncertain information environment, they tend to lean toward pessimistic forecasts, considering uncertainty as a risk and assigning lower valuations to stocks.

According to investor sentiment theory, the more complete risk information disclosure is, the more trust the market gives. Investors regard disclosures as supplementary incremental information rather than risk information, which helps them more accurately assess the true value of listed companies; thus, they are willing to pay higher IPO prices, providing optimistic predictions with high IPO price-to-earnings ratios (Yao and Zhao, 2016). Therefore, high-quality risk information delivers accurate and timely risk alerts from IPOs to market participants, reducing divergences in valuation and ultimately resulting in IPO prices tending to reflect their true value (Ritter and Welch, 2002).

Finally, the disclosure of high-quality information is a strategic behavior for adapting to market-oriented reforms and meeting regulatory requirements. Numerous information disclosure issues need to be solved urgently, such as "concealment of relevant financial report information" and "formalistic and templated disclosure of information," which has led to stakeholders demanding higher quality in information disclosures. Although risk information disclosure is constrained by policy regulations, it also has a certain degree of autonomy. In China's fiercely competitive IPO market, companies need to fully disclose information and improve their attractiveness to stand out among their many competitors.

Meanwhile, the IPO pricing mechanism has undergone a transformation from the substantive judgment of the issuer's profitability under the approval system to the comprehensive review of information disclosure under the registration system. Furthermore, the CSRC has completely delegated to the market judgment power the investment value of proposed listing companies. The regulatory authorities have added information disclosure requirements, such as "concise and clear, easy to understand," and "improving the targetedness, effectiveness, and readability of information disclosure," to the registration system's audit rules. Therefore, market-oriented reforms and stricter regulatory policies can guide issuers to actively disclose characteristic risk information, converge toward the direction of disclosing more forward-looking information expected by regulatory authorities, compensate for the relative lack of market supervision, and promote the healthy, orderly, and efficient operation of the capital market.

Based on the analysis (Fig. 1), this study proposes the following hypotheses.

H1. The quality of risk information disclosure is positively correlated with the IPO price-to-earnings ratio.

H2. The quality of risk information disclosure is negatively correlated with the IPO underpricing.

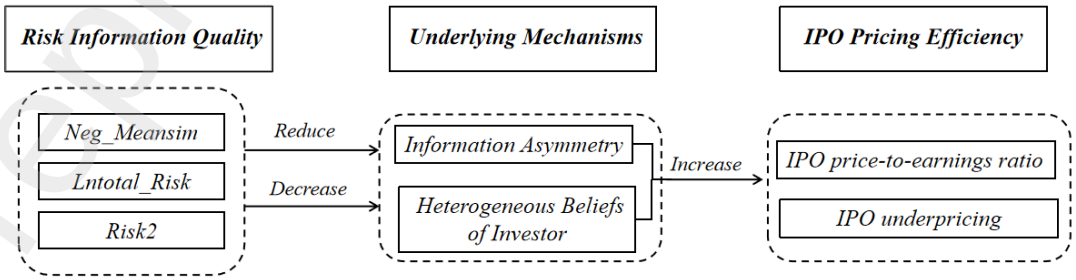

Fig. 1. Logic diagram of research hypotheses.

4. Data and variables

4.1. Sample and word vector construction

This study selected Chinese A-share-listed companies from 2007 to 2021 as research samples. The prospectus documents used in this study were obtained using web crawling technology to retrieve information from websites such as the Disclosure Information website, the Shanghai Stock Exchange, and the Shenzhen Stock Exchange. Python was used to parse the PDF documents to extract disclosed risk factors. Other data sources were from the CSMAR database and the Wind database. In the empirical research, we excluded financial sector companies as well as samples with incomplete data. After the above processing, we obtained a final sample of 2,305 company-year observations. To avoid the influence of extreme values on the estimation results, we truncated all continuous numerical variables at the 1% and 99% levels.

In the current study, the pretrained ERNIE model was used to calculate textual similarity. The most commonly used method for calculating textual similarity is to form a frequency vector weighted by the TF-IDF algorithm using word frequency and then calculate the cosine similarity between frequency vectors to obtain textual similarity (Hoberg and Phillips, 2016). However, the word-based frequency vectors ignore the semantic information of the context. Since the risk disclosure section is relatively complex and contains more textual information than the business scope section, traditional statistical machine learning algorithms may not achieve good results in processing risk disclosure text. Pretrained models can integrate semantic meaning into the formation of word vectors and capture knowledge in vocabulary, structure, and semantics through continual learning. Therefore, ERNIE was used to calculate the textual similarity of the risk disclosure section in the prospectus. Before applying the ERNIE model, the redundant information in the risk disclosure text was filtered and processed using the textrank algorithm following the approach of Cardinaels et al. (2019).

Furthermore, to compare the differences between the traditional text similarity calculation method based on word frequency and the text similarity method based on the pretrained ERNIE model, we selected two listed companies from the C34 industry for illustration and analysis. Please refer to Appendix A and Appendix B for detailed information.

4.2. Measuring the efficiency of IPO pricing

Pe_IPO is the IPO price-to-earnings ratio measured using the primary market issuance price-to-earnings ratio following the methodology of Yao and Zhao (2016). The formula is calculated as follows: $Pe\_IPO = Issuance\ Price/Earnings\ per\ Share\ after\ Issuance$.

UP is the IPO underpricing rate measured as the first-day return of the issuing company following the methodology of Loughran and McDonald (2013). The formula is $UP = (P_{i,2} - P_{i,1})/P_{i,1}$, where $P_{i,1}$ and $P_{i,2}$ represent the issuance and closing prices on the first trading day, respectively.

4.3. Measuring the quality of risk disclosure

Neg_Meansim is the quality of the risk disclosure for IPOs, measured as the textual similarity of the risk disclosure in the prospectus. Following the approach of Brown and Tucker (2011), who used textual similarity to measure the information content of MD&As, this study measured the quality of the risk disclosure using the heterogeneity of risk information disclosure in IPOs. The

specific calculation steps for the heterogeneity of risk information disclosure were as follows. First, each sample company was paired with all the other companies in the same industry. Subsequently, the similarity of risk information disclosure between each pair of companies was calculated, and the average similarity of the information disclosure among all paired companies was used to measure the similarity of the industry-level risk information disclosure of the sample company. A low similarity of this disclosure indicates that the company discloses less homogeneous risk information in the industry and is more closely related to private information, suggesting higher heterogeneity and higher quality of risk information disclosure.

4.4. Control variables

To obtain an unbiased estimate of the impact of risk disclosure on IPO pricing efficiency, a selection of control variables reflecting company characteristics, issuance features, and investor sentiment were selected.

Specifically, this study controlled for company size, profitability, growth, and governance structure that may affect IPO pricing efficiency. Company size was measured by the natural logarithm of the total assets in the IPO year (Lnasset). A larger IPO company, operating in a more standardized manner, tends to disclose information more thoroughly. Profitability was measured using the return on equity (Roe) and the cash flow ratio (Cfo_Asset). Higher profitability indicates that the IPOs' future financial performance is more likely to grow, avoiding underpricing situations. In terms of governance structure, this includes the proportion of institutional investor ownership (Proportion), the proportion of the largest shareholder (Top1), and ownership nature (PreIPO_Soe). Institutional investors, being the primary inquirers and subscribers during the IPO, not only make the issuance pricing more reasonable but may also become price boosters. Furthermore, this study controlled for two issuance feature variables: market environment and market volatility. The market environment was measured using the mean cumulative return rate of the company in the first 20 trading days before the IPO (Mean_Marketreturn), and the standard deviation of market returns (Sd_Marketreturn) served as risk perception before disclosure. Listed companies are more willing to issue stocks when market returns are high and market volatility is low. The higher the first-day return rate of IPOs is, the less likely there is to be underpricing.

Additionally, the ratio of the number of newly issued shares to the number of effective subscription shares is employed as a measure of investor sentiment (Lottery_Rate). The IPO's online issuance winning rate shows a negative correlation with the popularity of its secondary market stocks, and both are negatively correlated with the extent of IPO underpricing. The models in this study all control for industry-fixed effects and year-fixed effects. The specific variable definitions and explanations are shown in Appendix C .

4.5. Descriptive statistics

Table 1 shows the summary statistics for the key variables discussed in our empirical analyses. As indicated in the tabulated results, the IPO price-to-earnings ratio (Pe_IPO) exhibits a mean value of 32.66 with a standard deviation of 17.9. This suggests that new stock offerings most commonly demonstrate high price-to-earnings ratios, and there is a significant disparity in the level of price-to-earnings ratios across different industries. Regarding the IPO underpricing rate (UP), its mean value is reported as 39.4%, significantly greater than 0, confirming the presence of excess returns in the Chinese IPO market. Furthermore, when compared with the maximum value of 578.5% and

the minimum value of −78.2%, it indicates the existence of a polarized situation in which newly listed stocks can experience extreme surges or plunges after their IPOs. Detailed descriptive statistics for the remaining variables can be found in Table 1, and they will not be restated here.

Table 1

Summary statistics.

Variables	Obs	Mean	SD	Min	Max
Pe_IPO	2,305	32.66	17.9	6.67	131.5
Up	2,305	0.394	0.906	−0.782	5.785
Neg_Meansim	2,305	0.882	0.0573	0.705	0.981
Lntotal_Risk	2,305	1.968	1.294	0	4.997
Risk2	2,305	0.0365	0.0165	0.0128	0.107
Mean_Marketreturn	2,305	0.133	0.272	−0.736	1.328
Sd_Marketreturn	2,305	0.0156	0.00575	0.00693	0.0378
PreIPO_Soe	2,305	0.124	0.329	0	1
Lnasset	2,305	20.31	1.459	15.24	29.74
Cfo_Asset	2,305	0.108	0.115	−0.528	0.798
Proportion	2,305	31.82	32.48	0.0066	100
Top1	2,305	0.397	0.166	0.0952	0.87
Lottery_Rate	2,305	0.508	0.952	0.0127	6.482
Growth	2,305	0.77	3.015	−2.291	20.26
Roe	2,305	0.233	0.13	−0.194	0.712

This table reports the summary statistics of the variables used in the following analyses. Among the variables, Pe_IPO and UP are the calculated IPO pricing efficiency. Neg_meansim, Lntotal_risk, and Risk2 are the calculated risk information disclosure quality.

5. Models and empirical results

5.1. Model construction

To investigate the impact of risk disclosure on the pricing of IPOs in the primary market, this study constructed the following model:

$$Pe\_IPO_{i,t} = \alpha_0 + \alpha_1 \times Neg\_Meansim_{i,t} + Controls + \gamma_i + \mu_t + \varepsilon_{i,t} \quad (12)$$

$$UP_{i,t} = \alpha_0 + \alpha_1 \times Neg\_Meansim_{i,t} + Controls + \gamma_i + \mu_t + \varepsilon_{i,t} \quad (13)$$

5.2. Empirical results

To test the hypothesis, we conduct empirical analyses by estimating the baseline regression model in Models (12) and (13). We report the regression results in Table 2. In Column (1), it is evident that the improvement in risk disclosure quality in the prospectus (Neg_Meansim) led to an increase in the IPO price–earnings ratio (Pe_IPO). The impact of risk disclosure quality on the pricing of new stocks is statistically significant at the 5% level. This suggests that the more distinctive risk information disclosed, the higher the level of trust bestowed by market participants, ultimately resulting in a higher IPO price–earnings ratio. In particular, in integrity-lacking capital

markets, investors tend to favor companies that disclose information candidly and authentically, as opposed to generic, template-driven disclosures. Therefore, risk information provides investors with more incremental data to forecast future developments and accurately assess the value of the company, thus enhancing the issuance pricing.

In Column (2), it is evident that the enhancement of risk disclosure quality in the prospectus (Neg_Meansim) led to a reduction in the IPO underpricing rate (UP). Therefore, the higher the risk disclosure quality of the listed company, the lower the IPO underpricing rate. This signifies that the more distinctive risk information disclosed by IPOs, the more incremental information market participants receive. The enhancement in investors' comprehension and utilization of information efficiency naturally leads to a more accurate assessment of the value of IPOs, ultimately optimizing the pricing mechanism in the capital market. Hence, both H1 and H2 have been confirmed.

Table 2

IPO risk disclosure and market reaction.

Variables	Pe_IPO	UP
	(1)	(2)
Neg_Meansim	11.045**	−0.621***
	(2.69)	(−3.48)
Mean_Marketreturn_100	7.428***	−0.075**
	(10.12)	(−2.27)
Sd_Marketreturn	36.018	−3.371**
	(0.90)	(−2.37)
Preipo_Soe	−0.039	0.183***
	(−0.05)	(5.38)
Lnasset	−3.085***	−0.084***
	(−9.97)	(−8.11)
Cfo_Asset	−0.431	−0.178**
	(−0.28)	(−2.86)
Proportion	0.043***	−0.000
	(6.59)	(−1.59)
Top1	−1.531	−0.045
	(−0.53)	(−0.65)
Lottery_Rate	0.341**	−0.022**
	(2.27)	(−2.18)
Growth	0.241***	0.007
	(5.93)	(1.68)
Roe	−4.052***	−0.525***
	(−3.01)	(−4.49)
Constant	89.388***	2.541***
	(5.75)	(6.92)
Ind FE	YES	YES
Year FE	YES	YES
Observations	2305	2305
R-Squared	0.487	0.417

This table reports the results regarding risk information disclosure quality and IPO pricing efficiency. In all regressions, Ind and year-fixed effects are included. The values in parentheses are t-values based on robust standard errors. *** and ** are significance levels at 1% and 5%, respectively.

5.3 Robustness checks

5.3.1 Changing variable measurement methods

Given the significant differences in the main business activities of different listed companies, establishing a uniform standard for measuring risk information disclosure levels is challenging. Therefore, the selected indicators should be as comprehensive as possible. In selecting indicators for assessing the quality of risk disclosure, the most direct method is to use quantitative measures such as word counts and lengths.

Asay et al. (2018) demonstrated that managers actively use complex language in narrative disclosures as a strategic behavior to obscure adverse information about the company. To provide investors with a succinct and clear summary of the significant risks of IPOs, we use the total number of risk items in the prospectus (Lntotal_Risk) as a proxy for the quality of risk information disclosure in IPOs. As the requirements for risk information disclosure have evolved over the years, we categorize the risk items in the prospectus into six types: technical, operational, financial, internal control, legal, and other risks. This study employs the aggregate count of items across these six risk categories as a proxy variable for risk information disclosure quality.

"Hard information" is defined as data recorded in numerical form. This encompasses elements such as financial statements, histories of timely payments, and output quantities. Considering the digit count as intuitive quantitative information, which reduces information asymmetry and affects the IPO pricing efficiency by lowering investors' information processing costs, the ratio of the digit count to the length of the risk disclosure section in the prospectus (Risk2) was used as the proxy variable for risk information quality. The greater the proportion of the digit count to the length of the risk disclosure section is, the higher the quality of the risk information of the listed company is. We set two indicators, namely, the total number of risk items (Lntotal_Risk) and the proportion of digit count in the risk disclosure section (Risk2), as explanatory variables to test the effectiveness of the alternative indicators. The results are shown in Table 3, which are consistent with the main regression results in the previous section.

Table 3

Robustness checks.

Variables	Pe_IPO	UP	Pe_IPO	UP
	(1)	(2)	(3)	(4)
Lntotal_Risk	0.338***			
	(3.01)			
Risk2		−1.484***		
		(−3.59)		
Neg_Meansim			10.903**	−0.626***
			(2.65)	(−3.51)
Constant	98.231***	2.122***	94.523***	2.706***
	(6.46)	(6.08)	(6.06)	(7.56)
Controls	YES	YES	YES	YES
Ind FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	2305	2305	2305	2305
R-Squared	0.487	0.417	0.488	0.418

This table reexamines the impact of risk information disclosure quality on IPO pricing efficiency based on robustness

checks. In all regressions, Ind and year-fixed effects are included. The values in parentheses are t-values based on robust standard errors. *** and ** are significance levels at 1% and 5%, respectively.

5.3.2 Adding control variable.

Considering the frequent changes in IPO pricing and earnings ratio regulation, these controls were set to prevent overpricing of IPOs, either through explicit rules or implicit window guidance. In June 2009, China abolished the 30 times earnings ratio cap, leaving IPO pricing unrestricted until March 2012. From April 2012 to February 2014, IPO pricing had to reference industry standards, although companies could exceed these benchmarks, suggesting a weaker constraint during this period. Since 2014, IPO pricing has been limited to 23 times the earnings ratio. We add a control variable, PE_dum, for whether pricing regulation was in place: 1 for periods before June 10, 2009, and after June 2014, and 0 for other periods. As shown in Columns (3) and (4) in Table 3, the results are largely consistent with the main regression findings.

5.3.3 Heckman two-stage model

Considering the influence of the major shareholders and management on the IPO offering price, there may be a self-selection bias in the sample. Therefore, we used the Heckman two-stage model to re-examine the main regression results to alleviate the endogeneity issue caused by sample selection bias.

In the first stage, we divided the sample into two groups based on the quality of the risk information in the prospectus (Neg_Meansim). When the risk information quality of a listed company in the IPO year exceeds the industry average, it falls into the high-risk information quality group, and Neg_Meansim is assigned the value of 1; otherwise, it is categorized as the low-risk information quality group, and Neg_Meansim is assigned the value of 0. Subsequently, we used ownership nature (PreIPO_Soe), firm size (Lnasset), and the ratio of net operating cash flow to total assets in the IPO year (Cfo_Asset) as explanatory variables and controlled for industry and year-fixed effects in a probit regression.

In the second stage, we incorporated the inverse Mills ratio (IMR) calculated from the first stage into regression Models (12) and (13) for further examination of the impact of sample selection bias on the original estimates. The results of the Heckman two-stage model are shown in Table 4. The coefficient of IMR in Column (2) is significant at the 5% level, suggesting that there does exist sample selection bias. After adding IMR as a control variable in the baseline model, we still found a significant positive correlation between risk information quality (Neg_Meansim) and the IPO price-to-earnings ratio (Pe_IPO) and a significant negative correlation between risk information quality (Neg_Meansim) and IPO underpricing (UP). This finding suggests that the conclusion remains robust after controlling for the self-selection issue in the sample.

Table 4

Heckman two-stage model.

Variables	Pe_IPO	UP
	(1)	(2)
Neg_Meansim	10.756**	−0.597**
	(2.42)	(−2.39)
Mean_Marketreturn_100	7.375***	−0.071
	(5.35)	(−0.97)
Sd_Marketreturn	29.062	−2.839
	(0.49)	(−0.85)
IMR	−14.371	1.110**
	(−1.53)	(2.57)
PreIPO_Soe	−0.581	0.225***
	(−0.50)	(3.90)
Lnasset	−3.521***	−0.050***
	(−8.45)	(−2.71)
Cfo_Asset	3.905	−0.513***
	(0.90)	(−2.90)
Proportion	0.043***	−0.001
	(4.35)	(−0.98)
Top1	−1.351	−0.058
	(−0.67)	(−0.56)
Lottery_Rate	0.320	−0.021
	(0.69)	(−1.25)
Growth	0.236**	0.007
	(2.35)	(1.48)
Roe	−4.032	−0.528***
	(−1.33)	(−3.48)
Constant	117.817***	0.346
	(5.47)	(0.37)
Ind FE	YES	YES
Year FE	YES	YES
Observations	2299	2299
R^2_A	0.488	0.419

This table reports results based on the Heckman two-stage method. Columns (1) and (2) report results based on the high-risk information quality group (Neg_Meansimh), with the IMR from the first stage as an explanatory variable. In all regressions, Ind and year-fixed effects are included. The values in parentheses are t-values based on robust standard errors. *** and ** are significance levels at 1% and 5%, respectively.

5.4. Mechanisms

5.4.1 Channel of information asymmetry

New stocks are regarded as an “information black box” for investors, and their uniqueness exacerbates the phenomenon of information asymmetry. In a high-information-asymmetry–IPO environment, investors not only need to analyze quantitative financial data for risk assessment and investment decisions but also accurately interpret the textual language in the prospectus. Listed companies, to mitigate adverse selection from information asymmetry, release quality-related information through disclosures, attracting more professional intermediaries and analyst attention, thus reducing the company’s financing costs (Kelly and Ljungqvist, 2012).

Information asymmetry is a crucial factor affecting IPO pricing efficiency. Rock (1986) views IPO underpricing as compensation for the costs of gathering information on company value. High-quality risk information disclosure attracts more analyst attention, improving forecast accuracy (Lehavy et al., 2011), aligning stock prices with fundamentals, and enhancing market efficiency. Thus, we base our tests on information asymmetry to test the mechanism of risk information.

To explore the role that information asymmetry plays, we use the logarithm of the number of analysts following plus one (Analyst) as a proxy for information asymmetry, where a higher value for Analyst indicates lower information asymmetry, and vice versa. Subsequently, we conduct the mediating effect test on Analyst, in which the results are presented in Table 5.

Column (2) in Table 5, after controlling for company characteristics and issuance features, shows a positive correlation between risk information disclosure quality (Neg_Meansim) and analyst attention (Analyst), suggesting that higher-quality disclosure reduces information asymmetry between listed companies and investors. To further investigate this mechanism, we incorporated the Analyst variable into Models (12) and (13) to test its mediating effect. Column (3) indicates that the coefficient of Analyst is positive and significant. The results collectively indicate that enhancing risk disclosure quality attracts analyst attention and reduces the scope for IPOs to conceal adverse information, thus significantly improving information transparency and investors' expected returns, leading to a positive increase in the IPO price–earnings ratios.

Column 6 indicates that the coefficient of the Analyst variable is negative and significant, empirically demonstrating that improved risk information disclosure attracts analyst attention and reduces information asymmetry and investment risk. Consequently, investors demand lower risk compensation, leading to a decrease in the IPO underpricing rate.

Table 5

Possible mechanism: information asymmetry.

Variables	Pe_IPO	Analyst	Pe_IPO	UP	Analyst	UP
	(1)	(2)	(3)	(4)	(5)	(6)
Neg_meansim	11.045**	0.622**	9.489**	−0.621***	0.622**	−0.605***
	(2.69)	(2.37)	(2.60)	(−3.48)	(2.37)	(−3.54)
Analyst			2.502***			−0.026**
			(14.25)			(−2.52)
Constant	89.388***	−0.337	90.231***	2.541***	−0.337	2.532***
	(5.75)	(−0.56)	(6.07)	(6.92)	(−0.56)	(6.81)
Controls	YES	YES	YES	YES	YES	YES
Ind FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	2305	2305	2305	2305	2305	2305
R^2_A	0.487	0.635	0.496	0.417	0.635	0.418

This table reports the results of mechanism tests, considering information asymmetry as a potential channel. In all regressions, Ind and year-fixed effects are included. The values in parentheses are t-values based on robust standard errors. *** and ** are significance levels at 1% and 5%, respectively.

5.4.2 Channel of heterogeneous beliefs of investors

From the perspective of behavioral finance, Miller (1977) first introduced the concept of heterogeneous beliefs. Building upon this, Hong and Stein (2007) categorized the factors influencing the formation of heterogeneous beliefs into three types: gradual information flow,

limited attention, and previous heterogeneity. Therefore, the quality of risk information disclosure indeed affects the focal points of investors. Low-quality disclosures lead to different judgment expectations and investment decisions between the party with informational advantage and the party with informational disadvantage. Pessimists sell stocks to optimists, resulting in increased divergence of opinions among investors.

The crucial influence of information disclosure quality on investors' efficiency in interpreting information and making investment judgments. High-quality risk disclosure is an essential reference for investors to assess risks, make rational valuations, and select premium targets. Compared with historical data, investors pay special attention to forward-looking risk disclosures in the prospectus. Investors are able to effectively respond to IPO risk information, identifying potential threats that could affect short-term returns (Grover and Bhullar, 2021).

To explore the role that heterogeneous beliefs of investors play, we draw from Goyenko et al. (2009) to measure the degree of investor opinion divergence. The formula for calculating heterogeneous beliefs (Divergence) among investors is as follows:

$$Divergence = \begin{cases} 2\sqrt{-cov(\Delta P_t, \Delta P_{t-1})}, & cov(\Delta P_t, \Delta P_{t-1}) < 0 \\ 0, & cov(\Delta P_t, \Delta P_{t-1}) \geqslant 0 \end{cases} \quad (14)$$

where P_t represents the daily return of an individual stock considering reinvestment of cash dividends, and $cov(\Delta P_t, \Delta P_{t-1})$ denotes the first-order differenced sequence covariance of the daily returns of an individual stock considering reinvestment of cash dividends.

Subsequently, we conduct the mediating effect test about Divergence, in which the results are presented in Table 6. Column (2) reveals a significant negative correlation between Neg_Meansim and Divergence at the 1% confidence level. To further investigate this mechanism, we incorporated the Divergence variable into Models (12) and (13) to test its mediating effect. Column (3) indicates that the coefficient of Divergence is negative and significant. The results collectively reveal that risk disclosure enhances IPO price-to-earnings ratios by reducing investor heterogeneous beliefs. High-quality risk disclosure facilitates the formation of homogeneous expectations among investors, enabling them to make informed and rational value assessments. Consequently, this leads to an elevation in the IPO price-to-earnings ratios in the capital market.

Column (6) indicates that the coefficient of Divergence is positive and significant. With access to reliable information, investors can make more consistent investment decisions, thus reducing divergence among investors and lowering the underpricing on the first day of an IPO. As the quality of risk disclosure in the securities market improves, investors gradually return to rationality, and stock prices in efficient markets naturally converge toward their true intrinsic value.

Table 6

Possible mechanism: heterogeneous beliefs of investors.

Variables	Pe_IPO	Divergence	Pe_IPO	UP	Divergence	UP
	(1)	(2)	(3)	(4)	(5)	(6)
Neg_meansim	11.045**	−0.036***	10.495**	−0.621***	−0.036***	−0.496***
	(2.69)	(−6.70)	(2.55)	(−3.48)	(−6.70)	(−3.00)
Divergence			−15.437***			3.514***
			(−4.27)			(9.15)
Constant	89.388***	0.186***	92.265***	2.541***	0.186***	1.886***
	(5.75)	(11.73)	(5.91)	(6.92)	(11.73)	(4.74)
Controls	YES	YES	YES	YES	YES	YES
Ind FE	YES	YES	YES	YES	YES	YES

Year FE	YES	YES	YES	YES	YES	YES
Observations	2305	2305	2305	2305	2305	2305
R^2_A	0.487	0.090	0.488	0.417	0.090	0.438

This table reports the results of mechanism tests, considering the heterogeneous beliefs of investors as a potential channel. In all regressions, Ind and year-fixed effects are included. The values in parentheses are t-values based on robust standard errors. *** and ** are significance levels at 1% and 5%, respectively.

5.5. Effect of underwriter reputation on IPO pricing efficiency

As key intermediaries in the primary capital market, underwriters bridge issuers and investors. Their reputation serves as a crucial signal of professional standards (Booth and Smith, 1986). Issuers and investors can gauge the ethical and professional competence of underwriters based on their reputation. More reputable underwriters uphold higher prices in the initial stages of the secondary market (Neghab et al., 2023). In China's certain market segments with mandatory coinvestment systems, underwriters focus on both issuers' and other participants' interests, effectively constraining opportunistic behaviors. In competitive IPO markets, underwriters often invest significant resources in gathering IPO pricing information, enhancing the rationality of new stock issue prices (Fitza and Dean, 2016). Meanwhile, high-reputation underwriters can reduce IPO valuation uncertainty by accelerating the listing process and reducing information asymmetry.

To further verify the impact of underwriter reputation on the relationship between risk information disclosure and IPO pricing efficiency, we classify underwriter ranking as a grouping variable. IPOs with lead underwriters ranked in the top 20 are categorized as having a high reputation (high reputation = 1; low reputation = 0). Group regressions using baseline Models (12) and (13) in Table 7 show that the positive impact of risk information disclosure quality (Neg_Meansim) on the IPO price-to-earnings ratio (Pe_IPO) and the negative impact on the IPO underpricing rate (UP) are more significant in the low-reputation group. This suggests that for high-reputation underwriters, the effect of risk information on enhancing IPO pricing efficiency may be substituted by the impact of the underwriter's own reputation. Conversely, for companies guided to listing by low-reputation underwriters, high-quality risk information can facilitate an in-depth understanding of company operations and more accurate valuation by investors, thus making a more significant impact on improving pricing efficiency.

Table 7

Effect of underwriter reputation on IPO pricing efficiency.

Variables	Pe_IPO		UP	
	(1)	(2)	(3)	(4)
	Low reputation	High reputation	Low reputation	High reputation
Neg_Meansim	13.701**	8.712	−0.752**	−0.405
	(2.26)	(1.50)	(−2.10)	(−1.24)
Constant	102.050***	88.512***	3.187***	1.226**
	(5.12)	(7.02)	(5.60)	(2.08)
Controls	YES	YES	YES	YES
Ind FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
N	1441	864	1441	864
R^2_A	0.457	0.584	0.399	0.433

This table reports the effect of underwriter reputation heterogeneity on the relationship between risk information

disclosure and IPO pricing efficiency. In all regressions, Ind and year-fixed effects are included. The values in parentheses are t-values based on robust standard errors. *** and ** are significance levels at 1% and 5%, respectively.

5.6. Effect of audit reputation on IPO pricing efficiency

As crucial financial attestations in capital markets, accounting firms play an integral role, especially during the IPO stage. Audited financial information is key for investors in assessing company value, directly influencing investment decisions, and IPO pricing efficiency (Rauterkus and Song, 2005). Well-reputed accounting firms leverage their experience and expertise to proactively identify noncompliance, effectively certifying information. Companies with lower preaudit risks tend to select accounting firms with good reputations (Xiao and Tang, 2010). The well-reputed accounting firms have a stable client base, which enables them to maintain audit independence without the need to cater excessively to client demands. The firms provide investors with more accurate financial information, enhancing the trustworthiness of disclosed company information. This reduces preaudit uncertainties, guides investors to make rational stock valuations, and thereby lowers IPO underpricing.

To further verify the impact of audit reputation on the relationship between IPO risk information disclosure and pricing efficiency, we classify audit quality as a grouping variable. Companies audited by the Big Four (Big4) are contrasted with those audited by others (Non_Big4). Using baseline Models (12) and (13) for group regression, results in Table 8 reveal that risk information disclosure's coefficient is significant in the Non_Big4 group but not in the Big4 group, suggesting that the positive impact of risk information on IPO pricing efficiency is more evident in companies audited by lower-reputation firms. This suggests that for well-reputed accounting firms, the effect of risk information in enhancing IPO pricing efficiency may be substituted by the impact of the accounting firm's own positive supervisory role.

Table 8

Effect of audit reputation on IPO pricing efficiency.

Variables	Pe_IPO		UP	
	(1)	(2)	(3)	(4)
	Non_Big4	Big4	Non_Big4	Big4
Neg_Meansim	8.528***	35.237	−0.556**	−1.114
	(3.45)	(1.66)	(−2.61)	(−1.33)
Constant	85.526***	108.089***	2.583***	3.615
	(10.65)	(3.37)	(8.11)	(1.74)
Controls	YES	YES	YES	YES
Ind FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
N	2039	116	2039	116
R^2_A	0.485	0.180	0.419	0.282

This table reports the effect of audit reputation heterogeneity on the relationship between risk information disclosure and IPO pricing efficiency. In all regressions, Ind and year-fixed effects are included. The values in parentheses are t-values based on robust standard errors. *** and ** are significance levels at 1% and 5%, respectively.

6. Expansion research

6.1. Risk disclosure and long-term market performance

Previous studies have found the puzzle of long-term weakness in new stocks, where stocks with higher initial returns tend to perform worse in the future (Chi and Padgett, 2005). As the domestic capital market is not a completely efficient, strong-form market, investors' enthusiasm for subscriptions is relatively high in the initial stage of an IPO listing. However, as information is continuously disclosed, optimistic investors gradually return to rationality. Their expectations and value judgments of the company make them unwilling to hold the stock for the long term, and they sell it. Therefore, risk disclosures influence the decision-making of investors. The accumulation of risk news exceeds a certain threshold; continuing to conceal this bad news can lead to stocks performing poorly (Hutton et al., 2009).

This study uses the cumulative abnormal return (CAR) in the event study method as an indicator to measure the market performance of IPOs after listing. We take the first day of the IPO company listing as the event day (T_0). Referring to the literature of Zhang et al. (2021), we select [0,3], [0,60], and [0,100] as the window periods for calculating the cumulative excess returns based on the market model, which respectively measure the short-, medium-, and long-term stock market reactions after an IPO. To further test the impact of risk information disclosure in the prospectus on the long-term market performance of IPOs, the following regression model is constructed as follows:

$$CAR_{i,t} = \alpha_0 + \alpha_1 \times Neg\_Meansim_{i,t} + Controls + \gamma_i + \mu_t + \varepsilon_{i,t} \quad (15)$$

The dependent variable is stock market reaction (CAR), which is the sum of the abnormal returns of a company's stock price over multiple days. The regression results are shown in Table 9. Columns (1) to (3) of the table indicate a negative correlation between Neg_Meansim and the long-term performance (CAR) of IPO companies, and CAR(0,60) and CAR(0,100) are statistically significant when measuring the long-term market performance of IPOs. This suggests that risk information disclosure can to some extent help investors make reasonable judgments and rational expectations about the future growth prospects of IPOs to meet nonspeculative, long-term investment needs. From a long-term development perspective, the quality of risk information disclosure can predict the long-term market performance of future listed companies.

Table 9

Effect of risk disclosure on long-term market performance.

Variables	CAR(0,3)	CAR(0,60)	CAR(0,100)
	(1)	(2)	(3)
Neg_Meansim	0.002	0.109**	0.019***
	(0.05)	(2.34)	(6.67)
Constant	–0.084	–0.289**	–0.001
	(–1.04)	(–2.75)	(–0.10)
Controls	YES	YES	YES
Ind FE	YES	YES	YES
Year FE	YES	YES	YES
N	1596	1582	1561
R^2_A	0.044	0.036	0.019

This table presents the regression results of risk disclosure quality on the long-term market performance of IPOs. CAR is the sum of the abnormal returns of a company's stock price (AR_t) over multiple days, using daily data. The daily abnormal return (AR_t) is defined as the daily stock return of the company (R_t) minus the benchmark market return (RM_t). In all regressions, Ind and year-fixed effects are included. The values in parentheses are t-values based

on robust standard errors. *** and ** are significance levels at 1% and 5%, respectively.

6.2. Effect of registration-based reform on IPO pricing efficiency

Government intervention can trigger resource misallocations (Allen et al., 2005), whereas market-oriented reforms in the IPO process can significantly enhance the efficiency of resource allocation. Given the potential systemic differences between firms listed before and after the registration system reform, to mitigate the influence of individual sample firms on the empirical results, this study employs the propensity score matching (PSM) method, taking the registration system pilot as a natural regulatory scenario. This is done to further empirically examine the effect of the registration system reform on the relationship between risk disclosure and IPO pricing efficiency.

In the first step, the treatment group (Treat) is defined as companies that conducted IPOs after the announcement of the registration system reform. By contrast, the control group (Control) consists of companies that went public before the announcement of the registration system reform. In the second step, a Logit model is employed to compute propensity scores. Based on 11 indicators of control variables, a nearest-neighbor one-to-one match is conducted for sample firms to determine whether they were affected by the registration system reform. The balance test results after PSM matching are shown in Table 10, suggesting a balanced distribution of various variables between the treatment and control groups with no significant differences. Furthermore, the model is specified as follows:

$$Pe\_IPO_{i,t} = \alpha_0 + \alpha_1 \times DID * Neg\_Meansim_{i,t} + Controls + \gamma_i + \mu_t + \varepsilon_{i,t} \quad (16)$$

$$UP_{i,t} = \alpha_0 + \alpha_1 \times DID * Neg\_Meansim_{i,t} + Controls + \gamma_i + \mu_t + \varepsilon_{i,t} \quad (17)$$

The explanatory variable is DID × $Neg\_Meansim_{i,t}$ = Treat × Post × Neg_Meansim. Two periods are set: DID = 1, where the treatment group Treat = 1 consists of companies listed on the ChiNext stock exchange, and Post = 1 indicates the period after the implementation of the registration system reform; DID = 0 represents other situations. Treat = 1 indicates membership in the treatment group, and Treat = 0 indicates membership in the control group; Post = 1 indicates the postreform period, and Post = 0 indicates the prereform period. The regression results following PSM are presented in Table 11. The two columns indicate a notable increase in the IPO price–earnings ratio and a significant reduction in the IPO underpricing rate due to the implementation of the registration system reform. These findings align with the H1 and H2 proposed in this study.

Table 10

Balance test of PSM.

Variables	Unmatched/ matched	Mean		%Bias	%Reduct |Bias|	T test	
		Treated	Control			T	P > |T|
Mean_Marketreturn	U	0. 1568	0.13076	9.8		2.16	0.031
	M	0. 16025	0.15256	2.9	70.4	0.52	0.602
Sd_Marketreturn	U	0.01511	0.01524	−2.5		−0.55	0.583
	M	0.01507	0.01515	−1.7	33.5	−0.30	0.763
PreIPO_Soe	U	0.04993	0.11465	−23.7		−4.84	0
	M	0.05216	0.05027	−0.7	97.1	0.16	0.875
Top1	U	0.3675	0.40918	−26.6		−5.61	0

	M	0.36868	0.36251	3.9	85.2	0.77	0.444
Lnasset	U	19.578	20.412	−81.9		−17.18	0
	M	19.653	19.669	−1.6	98.0	−0.37	0.710
Cfo_Asset	U	0.11146	0.10704	3.9		0.85	0.394
	M	0.11055	0.10803	2.2	42.9	0.39	0.700
Proportion	U	26.927	33.374	−20.8		−4.39	0
	M	27.399	27.815	−1.3	93.5	−0.26	0.797
Lottery_Rate	U	0.50741	0.52072	−1.4		−0.30	0.766
	M	0.48134	0.43462	5.0	−250.9	1.02	0.309
Growth	U	0.97295	0.71552	8.3		1.83	0.067
	M	0.94812	0.94227	0.2	97.7	0.03	0.974
Roe	U	0.25391	0.22679	20.9		4.56	0
	M	0.24786	0.23481	10.0	51. 9	1.78	0.075

This table presents the PSM balance test result. According to the p-value of the last column in the table, the matching effect can be judged. %Reduct |Bias| is used to measure the reduction of standardized deviation. If the value is greater than 0, it indicates that the matching effect is good, and if the value is less than 0, it indicates that the matching effect is not good. The larger the value is, the better it is.

Table 11

Effect of registration reform.

Variables	Pe_IPO	UP
	(1)	(2)
DID_Neg_Meansim	23.019	−3.685***
	(1.06)	(−3.22)
DID	−19.536	4.355***
	(−1.03)	(4.36)
Treat_Neg_Meansim	38.125***	0.071
	(3.12)	(0.11)
Post_Neg_Meansim	−4.278**	−0.079
	(−1.99)	(−0.70)
Treat	−34.098***	−0.156
	(−3.17)	(−0.28)
Neg_Meansim	−9.225	−0.283
	(−1.20)	(−0.70)
Constant	126.931***	3.320***
	(11.04)	(5.49)
Controls	YES	YES
Ind FE	YES	YES
Year FE	YES	YES
Observations	1,636	1,636
R-Squared	0.521	0.511

This table presents results for the exogenous registration system. In all regressions, Ind and year-fixed effects are included. The values in parentheses are t-values based on robust standard errors. *** and ** are significance levels at 1% and 5%, respectively.

7. Conclusion

With the acceleration of the marketization process, China has established an IPO system that focuses on information disclosure and delegates the right of choice to the market. Issuing pricing has become a key link, and the valuation of listed companies directly reflects the recognition of market participants. This study selects the prospectuses of A-share listed companies from 2007 to 2021 as the research objects, uses text analysis to construct measurement indicators for the quality of risk information disclosure, and empirically tests the relationship between the IPO risk information disclosure level and new stock issuance pricing.

The results demonstrate that the higher the quality of the risk information disclosure in the prospectus is, that is, the lower the text similarity is, the higher the IPO price-to-earnings ratio is, and the lower the IPO underpricing rate is. The above conclusion remains valid using robustness tests, Heckman's two-stage model, adding control variables, and replacing key variables. In terms of the mechanism, the risk information disclosure reduces information asymmetry and decreases investors' heterogeneous beliefs, which subsequently increases the IPO price-to-earnings ratio and reduces IPO underpricing. Heterogeneity analysis reveals that the effect of risk information disclosure on IPO pricing efficiency is more significant in groups characterized by lower underwriter reputation and lower audit firm reputation. In addition, we find that the higher the quality of risk information disclosure is, the better the long-term market performance of the listed companies is. Finally, we employ the pilot implementation of the registration system in a quasi-natural experimental context. The outcomes demonstrate that the implementation of the registration system reform increased the IPO price-to-earnings ratio and significantly reduced IPO underpricings. In this study, we find another way to measure idiosyncratic risk information and further enrich the research on IPO underpricing theory from the perspective of information disclosure. We also help listed companies improve their level of risk information disclosure, playing an important role in improving the efficiency of financial resource allocation and developing a mature and effective capital market.

Based on the above conclusions, this study proposes the following suggestions.

First, from the perspective of regulatory agencies, the risk disclosure environment for IPO companies in China urgently needs to be improved. The regulation of risk disclosure should be strengthened, which can enhance the information value and operational efficiency of China's capital markets and support the overall registration-based system. Additionally, to fully leverage the positive role of risk disclosure, it is necessary to establish institutional norms for the categories, forms, and contents of risk disclosure based on national conditions to facilitate effective decision-making by investors and thus improve the pricing efficiency of securities markets.

Second, from the perspective of issuers, listed companies need to fully recognize the effectiveness of risk disclosure in the capital market and actively improve the level of such disclosures. Risk information has the utility of alleviating information asymmetry, helping market participants understand the business activities and operational risks of enterprises, and reducing the adverse selection risks that investors may face from information disadvantages. Conversely, risk disclosure can affect investors' subscription intentions. High-quality companies can differentiate themselves from low-quality companies by adopting the disclosure of high-quality information to win the trust of investors while complying with listing compliance requirements. In particular, under the background of the registration-based system, information disclosure is the top priority of market-oriented reform, which incentivizes issuers to further standardize and disclose their risk factors.

Third, from the perspective of market participants, this study confirms the significant correlation among risk disclosure, IPO pricing efficiency, and long-term market performance after IPOs, providing investors with evidence-based tools for evaluating the investment value of individual stocks. This further encourages investors to enhance their information processing capabilities and make rational value judgments, thus selecting high-quality investment targets and reducing the uncertainty of their future returns.

Appendix A

To compare the differences between text similarity calculated based on word frequency and that calculated based on pre-training methods, we extracted companies from the C34 industry for illustration and analysis. Sichuan Zigong Transportation Machinery Group Co., Ltd. (001288) and Suzhou Haihong Heavy Industry Co., Ltd. (002255) both belong to the C34 industry. Sichuan Zigong Transportation Machinery Group Co., Ltd. (001288) mainly focuses on the R&D, design, production, and sales of energy-saving and environmentally friendly conveyor machinery equipment, primarily belt conveyors. In contrast, Suzhou Haihong Heavy Industry Co., Ltd. (002255) is mainly engaged in the manufacturing and sales of waste heat boilers, large and special material pressure vessels, and nuclear safety equipment; environmental comprehensive governance services for solid waste, wastewater, and other pollutants treatment and recycling; and photovoltaic power station operation and EPC business. The two manufacturing samples have significant differences in their main business, so we expect them to face different risks. However, as seen in Appendix Table 2, the TF-IDF cosine similarity for risk similarity calculation is 92.41%, while the ERNIE similarity is 31.28%. Comparatively, we believe that the ERNIE similarity is more reasonable.

\Moreover, we calculated the difference in results between TF-IDF cosine similarity and ERNIE similarity in the C34 industry (diff = Sim - tfidfsim), which is significantly non-zero at the 1% level, indicating that the TF-IDF cosine similarity value and ERNIE similarity value are significantly different.

Variable	Obs	Mean	Std.Dev	[95%Conf.Interval]	
diff	16,900	0.063	0.466	0.056	0.070
mean=mean(diff)		t=17.620		degreesoffreedom=16899	
Ho:mean=0					
Ha:mean<0		Ha:mean!=0		Ha:mean>0	
Pr(T<t)=1.000		Pr(|T|>|t|)=0.000		Pr(T>t)=0.000	

Appendix B

Sim:31.28% tfidfsim: 92.41%	
001288	002255
Investors evaluating the company's stock value must consider risk factors such as major industrial policy changes, market fluctuations due to economic environment changes, and significant fluctuations in raw material market prices. These fluctuations in raw material prices will affect the company's production costs. The fluctuation of stock prices is a risk. The changes in stock prices are influenced by the company's operating conditions. The company faces	X. Risk of Product Quality: The production and use of waste heat boilers have high technical requirements and safety standards, which may affect the demand for the company's waste heat boiler products. The risk factors associated with investing in the company's stocks involve a series of risks. IX. Safety Production Risk: The manufacturing process of waste heat boiler products is complex. Some production enterprises in the traditional boiler industry have also gradually

risks of declining performance due to intensified market competition, which could significantly adversely affect the company's operations and performance. Therefore, the development trends of the main industries of downstream customers will have a considerable impact on the company's future profitability and development scale. This could lead to risks of the current fundraising investment projects not being completed on schedule or failing to achieve expected returns. Hence, fluctuations in the macroeconomy can impact the material conveyance industry. The added depreciation and amortization expenses will adversely affect the project's expected returns and the company's operating performance. These are mainly influenced by factors such as industry development, market environment, customer structure, employee compensation levels, and cost control. If the company cannot effectively control or manage accounts receivable in the future, market environment changes or market development obstacles could directly affect the company's cash flow and operating situation. There still exists a risk of material price fluctuations affecting company performance, adversely impacting the company's profitability and cash flow situation.The main raw materials of Sichuan Zigong Transportation Machinery Group Co., Ltd. (001288) and Suzhou Haihong Heavy Industry Co., Ltd. (002255) in the C34 industry are steel, conveyor accessories, and belts. Both companies focus on environmental protection and clean production. Significant adverse changes in the industry environment or market demand could affect the scale and profit level of the company's overseas projects, leading to accounts receivable collection risks. The company's tax benefits for various periods are as follows (in ten thousand yuan units): impact of tax incentive policies, deduction impact, tax incentive amount, total profit amount, and the proportion of tax incentives to profit. Safety production risks are also a concern as the production process involves operating many machines and electrical facilities. The company faces risks of expanded production capacity leading to market sales risks. Demand for excellent technical, sales, production, and management personnel is expected to increase. The company's operating performance is also influenced by international and domestic macroeconomic situations, economic policies, capital market fluctuations, and unexpected events. These factors increase the difficulty of operational decision-making, organizational management, and risk control, thereby affecting the company's operating performance.For the current fundraising, the company plans to invest in projects such as the digital processing production line technical transformation project for large-scale pipe belt machines and the construction project for an intelligent production base for open-air large-capacity energy-saving and environmentally friendly conveying equipment. These projects aim to expand production capacity. The market concentration of the material conveyance industry is not high, and management risks increase with the expansion of operating scale and employee numbers. The company has been committed to the R&D, production, and sales of belt conveyors since its establishment, and fluctuations in the gross profit margin may negatively impact future operating	entered the field of waste heat boiler production. There is a strong demand for the company's waste heat boiler products. IV. Risk of Contract Breach due to Delayed Delivery: There's a risk of technical worker shortage in the company regarding contracts for waste heat boilers signed with purchasers. II. Risk of Dependence on Related Industries: The company's waste heat boiler products are mainly used in industries with high energy consumption and relatively severe environmental pollution, such as steel, non-ferrous metals, coking, building materials, petrochemicals, chemicals, paper, and power. The cost of main raw materials accounts for a significant portion of the company's production costs. The production cycle of waste heat boilers can reach months. VIII. Risk of Technical Development and Design Support: China's waste heat boiler technology mainly developed by digesting and absorbing foreign advanced technologies. III. Risk of Raw Material Price Fluctuation: The company organizes product production and sales based on the sales-to-production method. The feasibility analysis of the aforementioned investment projects is based on comprehensive assumptions made from current domestic and international market environments, technological development trends, product prices, raw material supply, and process technology. XII. Risk of Fundraising Investment: The funds raised will be used for high-efficiency waste heat boiler manufacturing technology transformation projects and enterprise technology R&D center technology transformation projects. I. Market Competition Risk: The waste heat boiler industry is a new industry in China's energy conservation and environmental protection field. The company can basically ensure the demand for technical workers. If the company cannot rapidly expand production scale, continue to improve brand influence, and ensure a leading position in the industry in future development, it may face risks. VII. Exchange Rate Risk: With the company's dry quenching, non-ferrous metallurgy, and oxygen converter waste heat boilers gradually maturing in product design and manufacturing, the capacity expansion post-investment in high-efficiency waste heat boiler manufacturing technology transformation projects will greatly increase, and the demand for waste heat boiler products will be strong. The prices of raw materials required by the company may change significantly during production, presenting risks dependent on the development of related industries. However, the technical development and design support for some of the company's non-advantage products still need to be completed through cooperation. The company's export of waste heat boiler products is on an upward trend year by year. After the implementation of the aforementioned projects, the company's capacity for waste heat boilers will rapidly expand. As of the company's accounts receivable net amounts were RMB, and respectively. The balance of accounts receivable grew rapidly, and as of, the proportion of accounts receivable to the total amount of accounts receivable was. The company will still face certain exchange rate risks. XI. Risk of Shortage of Technical Workers: Currently, V. Risk of High Asset-Liability Ratio: The company's predecessor, Hailu Boiler, was established with a registered capital of only RMB, but there is still a risk of product quality risk due to poor

efficiency and the effectiveness of internal control systems. This could bring risks to the company's operations and other minority equity shareholders. The company's gross profit margin is subject to fluctuations, and risks associated with fundraising investment projects are based on the assumption that the projects are completed and put into operation on time.	management, lax quality control, and other human factors, which will directly affect the aforementioned investment projects and the overall revenue of the company. The company has very strict standards and requirements in production processes and product quality. The company's product quality control system is relatively complete.

Appendix C

Variable definitions.

Labels	Variables	Definitions
Pe_IPO	IPO price-to-earnings ratio	Issuance price/earnings per share after issuance
UP	IPO underpricing rate	$(P_{i,2} - P_{i,1})/P_{i,1}$
Neg_Meansim	Risk similarity	Take the average of 1 minus text similarity between the risk disclosure sections of the sample firm and all firms in the same industry
Lntotal_risk	Total number of risk items	Total number of overall risks extracted from the "Risk Factors" section plus 1 was then taken, and the natural logarithm
Risk2	Numeric characters scale	Proportion of numerical characters in the risk disclosure section of the prospectus was calculated as a percentage of the total length
Mean_Marketreturn	Market conditions	Average market return
Sd_Marketreturn	Market bias	Standard deviation of market returns
PreIPO_Soe	Nature of equity ownership	Dummy variable = 1 for controlling shareholder is state-owned enterprise and = 0 otherwise
Lnasset	Firm size	Natural logarithm of total assets at the end of the year
Cfo_Asset	Cfo asset size	Ratio of net operating cash flow to total assets in the IPO year
Proportion	Proportion of institutional investor	Shareholding ratio of institutional investors
Top1	Equity concentration ratio	Ratio of shares held by the largest shareholder
Lottery_Rate	Subscription success rate	Online subscription success rate
Growth	Growth of IPOs	Operating profit growth rate
Roe	Net return on assets	Ratio of a company's net profit to its net assets

References

Allen, F., Qian, J., & Qian, M. (2005). Law, finance, and economic growth in China. *Journal of Financial Economics, 77*(1), 57-116.

Arnold, T., Fishe, R.P.H., & North, D. (2010). The effects of ambiguous information on initial and subsequent IPO returns. *Financial Management, 39*(4), 1497-1519.

Asay, H.S., Libby, R., & Rennekamp, K. (2018). Firm performance, reporting goals, and language choices in narrative disclosures. *Journal of Accounting and Economics, 65*(2-3), 380-398.

Ayuningtyas, E.S., & Harymawan, I. (2022). Risk management committee and textual risk disclosure. *Risks, 10*(2), 30.

Beatty, R.P., & Ritter, J.R. (1986). Investment banking, reputation, and the underpricing of initial public offerings. *Journal of Financial Economics, 15*(1-2), 213-232.

Booth, J.R., & Smith II, R.L. (1986). Capital raising, underwriting and the certification hypothesis. *Journal of Financial Economics, 15*(1-2), 261-281.

Brockman, P., Gao, X., Li, X., & Xu, Y. (2023). The impact of differential risk disclosures: Evidence from cross-listed firms in China and Hong Kong. *International Review of Economics & Finance*, *88*, 442-457.

Brown, S.V., & Tucker, J.W. (2011). Large-sample evidence on firms' year-over-year MD&A modifications. *Journal of Accounting Research, 49*(2), 309-346.

Campbell, J.L., Chen, H., Dhaliwal, D.S., Lu, H.M., & Steele, L.B. (2014). The information content of mandatory risk factor disclosures in corporate filings. *Review of Accounting Studies, 19*, 396-455.

Cardinaels, E., Hollander, S., & White, B.J. (2019). Automatic summarization of earnings releases: Attributes and effects on investors' judgments. *Review of Accounting Studies, 24*(3), 860-890.

Chi, J., & Padgett, C. (2005). The performance and long-run characteristics of the Chinese IPO market. *Pacific Economic Review, 10*(4), 451-469.

Clements, A.E., & Liao, Y. (2020). Firm-specific information and systemic risk. *Economic Modelling, 90*, 480-493.

Fitza, M., & Dean, T.J. (2016). How much do VCs and underwriters matter? A comparative investigation of venture capitalist and underwriter effects on IPO underpricing. *Venture Capital*, *18*(2) , 95-114.

Goyenko, R.Y., Holden, C.W., & Trzcinka, C.A. (2009). Do liquidity measures measure liquidity? *Journal of Financial Economics, 92*(2), 153-181.

Grover, K.L., & Bhullar, P.S. (2021). The nexus between risk factor disclosures and short-run performance of IPOs–evidence from literature. World Journal of Entrepreneurship, *Management and Sustainable Development, 17*(4), 907-921.

Guo, H., Wang, Y., Wang, B., & Ge, Y. (2022). Does prospectus AE affect IPO underpricing? A content analysis of the Chinese stock market. *International Review of Economics & Finance*, *82*, 1-12.

Hoberg, G., & Phillips, G. (2016). Text-based network industries and endogenous product differentiation. *Journal of Political Economy, 124*(5), 1423-1465.

Hong, H., & Stein, J.C. (2007). Disagreement and the stock market. *Journal of Economic Perspectives, 21*(2), 109-128.

Hope, O.K., Hu, D., & Lu, H. (2016). The benefits of specific risk-factor disclosures. *Review of Accounting Studies, 21*(4), 1005-1045.

Hutton, A.P., Marcus, A.J., & Tehranian, H. (2009). Opaque financial reports, R^2, and crash risk. *Journal of Financial Economics, 94*(1), 67-86.

Kelly, B., & Ljungqvist, A. (2012). Testing asymmetric-information asset pricing models. *Review of Financial Studies, 25*(5), 1366-1413.

Khandelwal, C., Kumar, S., Verma, D., & Pratap Singh, H. (2019). Financial risk reporting practices: Systematic literature review and research agenda. *The Bottom Line, 32*(3), 185-210.

Lehavy, R., Li, F., & Merkley, K. (2011). The effect of annual report readability on analyst following and the properties of their earnings forecasts. *The Accounting Review, 86*(3), 1087-1115.

Li, F. (2008). Annual report readability, current earnings, and earnings persistence. *Journal of Accounting and Economics, 45*(2-3), 221-247.

Li, G., Jing, Z., Li, J., & Feng, Y. (2023). Drivers of risk correlation among financial institutions: A study based on a textual risk disclosure perspective. *Economic Modelling, 128*, 106468.

Li, W.A., Zhang, L.D., & Zhang, S. (2012). Corporate governance, investor heterogeneous beliefs, and stock investment risk: An empirical study based on Chinese listed companies. *Nankai Business Review, 15*(06), 135-146.

Li, Y., He, J., & Xiao, M. (2019). Risk disclosure in annual reports and corporate investment efficiency. *International Review of Economics & Finance*, *63*, 138-151.

Loughran, T., & McDonald, B. (2013). IPO first-day returns, offer price revisions, volatility, and form S-1 language. *Journal of Financial Economics, 109*(2), 307-326.

Loughran, T., & McDonald, B. (2023). Management disclosure of risk factors and COVID-19. *Financial Innovation, 9*(1), 1-9.

Milgrom, P. R. (1981). Good news and bad news: Representation theorems and applications. *The Bell Journal of Economics*, 380-391.

Neghab, D. P., Bradrania, R., & Elliott, R. (2023). Deliberate premarket underpricing: New evidence on IPO pricing using machine learning. *International Review of Economics & Finance*, *88*, 902-927.

Ntim, C.G., Lindop, S., & Thomas, D.A. (2013). Corporate governance and risk reporting in South Africa: A study of corporate risk disclosures in the pre-and post-2007/2008 global financial crisis periods. *International Review of Financial Analysis, 30*, 363-383.

Rauterkus, S.Y., & Song, K.R. (2005). Auditor's reputation and equity offerings: the case of Arthur Andersen. *Financial Management, 34*(4), 121-135.

Ritter, J.R., & Welch, I. (2002). A review of IPO activity, pricing, and allocations. *Journal of Finance, 57*(4), 1795-1828.

Rock, K. (1986). Why new issues are underpriced. *Journal of Financial Economics, 15*(1-2), 187-212.

Wu, D.X., Yao, X., & Guo, J.L. (2021). Is textual tone informative or inflated for firm's future value? Evidence from Chinese listed firms. *Economic Modelling, 94*, 513-525.

Xiao, X.F., & Tang, H. (2010). Auditors' choice in IPO market: Data from 2006 to 2008. *Audit and Economic Research, 25*(06), 37-43.

Yang, M., Dong, D.Y., & Xu, Y.A. (2022). Risk information disclosure and stock liquidity: Based on textual analysis of annual reports of Chinese A-share listed companies. *Journal of Systems Management, 31*(04), 794-810.

Yi, Y., & Mei, Z. (2016). Chinese-style risk disclosure, disclosure level and market reaction. *Economic Research*, *51*(07), 158-172.

Zeng, Y., & Lu, Z. F. (2006). Information Disclosure quality and equity financing Cost. *Economic research*, *2*(2).

Zhang, G. L., Xue, H. L., & Hao, G. (2021). Enterprise IPO value review and stock market performance. *Economic research*, *10*, 155-171.