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CEOs' hometown connections and optimism in analyst earnings forecasts: Evidence from China

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ABSTRACT

This study investigates the relationship between CEOs' hometown connections with suppliers and analyst earnings forecast optimism. We put forward two hypotheses: CEOs' hometown connections increase the optimism bias of analysts and analysts take the initiative to lower their optimistic earnings forecasts in response to CEOs' hometown connections. Using the hand-collected data of CEOs' hometown connections in Chinese A-share listed companies from 2009 to 2020, the empirical results suggest that CEOs' hometown connections with suppliers are negatively associated with analyst optimism bias, and the finding holds up in the subsequent robustness tests. The hometown connections, as an informal institution, not only alleviate CEO moral hazard but also provide information advantage. This "hometown effect" is more pronounced for firms with lower-quality of information disclosure, lower transparency, lower-quality auditing, higher agency costs, and firms in provinces with weaker marketization. In general, this study demonstrates the importance of CEOs' hometown connections in analyst optimism bias, and it enriches and expands research on the determinant factors of analyst optimism.

1. Introduction

Data from the CSMAR database indicates that the number of analyst forecasts surged by 252.78%, rising from 60,431 in 2009 to 152,760 in 2020 (as shown in Fig. 1). Analysts, as information intermediaries (Jensen and Meckling, 1976), play a critical role in bridging the gap between companies and investors, thereby fostering transparency and advancing market development. Previous studies have attributed analysts' optimistic bias to cognitive biases (De Bondt and Thaler, 1990; Teoh and Wong, 2002) and conflicts of interest (Lin and McNichols, 1998; Michaely and Womack, 1999; Irvine, 2004; Francis and Philbrick, 1993; Das et al., 1998). However, the impact of a CEO's social network on this bias remains unexplored, particularly regarding hometown connections with suppliers, which could significantly influence analysts' forecasts.

It is argued that people tend to associate and communicate with people who share similar backgrounds and characteristics to them (M. M. Granovetter, 2005; Stolper and Walter, 2019; Byrne, 1971). Hometowns, in particular, foster homogeneous ties among individuals by encompassing common dialects, traditions, cultures, and diets (Shen et al., 2019; Kong et al., 2020). According to

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Fullilove (1996), people have a personal preference for their place of birth and will prefer to focus on their hometown. Fisman et al. (2018) emphasize that hometown connections remain highly significant in Chinese society, where the "Guanxi" culture plays a pivotal role in business development (Gold and Guthrie, 2002). Allen et al. (2005) argue that hometown connections often supplement formal norms (contracts) in emerging markets with immature legal systems. The potential endorsement of hometown connections aids in bridging the trust in various contracts or business collaborations. Historical examples, such as the flourishing Hui Merchant Guild of Anhui province and the Jin Merchant Guild of Shanxi province during the Ming and Qing dynasties, as well as the modern Chaoshan Merchant Guild, illustrate how cooperation and solidarity among fellow-townsmen can promote thriving business activities. Previous research has consistently demonstrated investors' preference for hometown stocks (Coval and Moskowitz, 1999; Ivković and Weisbenner, 2005; Grinblatt and Keloharju, 2001; Pool et al., 2012). Additionally, studies show a bias toward hometown acquisitions (Cai and Sevilir, 2012; Ahern et al., 2015; Chung et al., 2018; Jiang et al., 2019) and a tendency for management to favor hiring hometown workers (Yonker, 2017). Cohen et al. (2011) further highlight that government officials are more inclined to allocate resources to their hometowns.

The "hometown preference" of CEOs is driven by three major factors: the first is familiarity preference (Seasholes and Zhu, 2010; Manzo, 2003; Pool et al., 2012), the second is information advantage (Uzzi, 1996; Coval and Moskowitz, 2001), and the third is the personal self-interest of CEO (Morck et al., 1990; Harford et al., 2012).

According to the relevant literature, when the CEO and suppliers from the same hometown province establish a connection, two possible effects on analyst earnings forecast optimism can emerge. First, the CEO-supplier connection, driven by the information advantage, can facilitate the flow of information and effectively alleviate uncertainty concerns during collaboration (Uzzi and Lancaster, 2003). This not only enhances trust between the two parties but also promotes future communication between organizations (Barden and Mitchell, 2007). Trust developed through such interpersonal communication, serving as an informal norm complementary to formal contracts (Uzzi, 1997), plays an important role in organizational operations, mitigating issues related to information asymmetry and moral hazard, and thereby reducing analyst optimism bias. In other words, the business partnership between the CEO and his local suppliers can assist the CEO in obtaining additional external information, enhancing the accuracy of analyst earnings forecasts. Moreover, the hometown connections also provide a monitoring channel for the suppliers, curbing potential conflicts of interest between CEOs and analysts. Second, some studies argue that familiarity-driven "hometown preference" is primarily about personal identification with the hometown and does not yield additional benefits for the firm. CEOs' own familiarity preference may lead to overconfidence, resulting in an overestimation of information advantages and poor investment decisions (Chung et al., 2018), distorting managers' rational decisions and reducing the flow of information. Simultaneously, CEOs may also abuse this trust (acquired through hometown connections) to engage in misconduct, pursue personal interests, or conceal negative firm information (Gu et al., 2020), thereby increasing analyst optimism bias. These contrasting perspectives highlight an ambiguity regarding the impact of CEOs' hometown connections with suppliers on analyst earnings forecast optimism.

China's vast territory environment and "Guanxi" culture provide an ideal setting for this study. First, each region of China has its own cultural traditions, dialect, *and* dietary habits, *which* collectively shape the people who are born and raised in that region. Hometown connections represent the convergence of cultural and behavioral traits among people from the same region (McPherson et al., 2001). Chinese people view their hometown connections to be an important source of self-identity (Jacobs, 1982). Second, rooted in *traditional* Confucianism, the hometown connection is one of the most common and fundamental relationships in Chinese

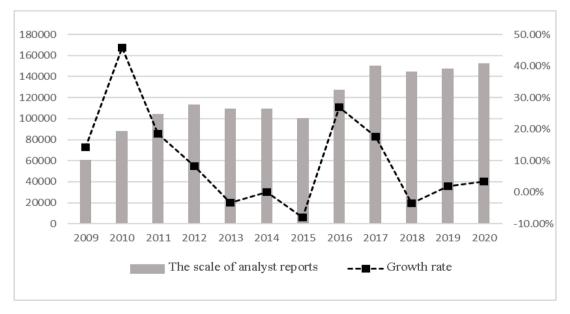


Fig. 1. The scale of analysts' reports on China's A-share market from 2009 to 2020.

society (Chen and Chen, 2004), and it plays a key role in various types of social networks (Fisman et al., 2018). Such connection can influence a CEO's personal behavior and perception, ultimately affecting analysts' valuation of the company.

Using the hand-collected data of CEOs' hometown connections in A-share listed companies of China from 2009 to 2020, this paper examines the relationship between CEOs-suppliers' hometown *connections* and analysts' optimism bias in earnings forecasts. We find that CEOs-suppliers' hometown connections reduce analysts' optimism bias significantly, and this result holds up in a series of subsequent robustness tests. Simultaneously, the "hometown effect" is more pronounced for firms with lower-quality of information disclosure, lower transparency, lower-quality auditing, greater agency costs, and firms in provinces with weaker marketization.

This paper makes four major contributions to the literature. First, it contributes to the literature on CEO connections, besides the impact of CEO hometown connections on corporate behavior such as tax avoidance (Shen et al., 2019), corporate acquisitions(Chung et al., 2018), green innovation (Ren et al., 2021), and trade credit (Kong et al., 2020). Meanwhile, recent studies on the optimism bias of analysts have focused more on external market factors such as short selling (Hou et al., 2021), anti-corruption campaigns (Li et al., 2021), and share pledging (Hu et al., 2021). We also document a new determinant factor for analyst earnings forecasts optimism, and this study advances the literature on analyst optimism.

Second, we discover that the governance effects of such hometown connections are more pronounced for firms with greater agency costs, insufficient external monitoring, and firms in regions with weak marketization, implying that CEO hometown connections will serve as an informal institution to alleviate uncertainty among business partners, while also providing moral security for CEOs and expanding business development opportunities in developing countries and relatively less marketized regions.

Third, hometown connections can facilitate information exchange, reduce information asymmetry, and improve the quality of information disclosure, hence reducing analysts' optimism bias. The findings of this paper indicate that CEO hometown connections have a greater impact on reducing analysts' optimism bias in firms with lower-quality of information disclosure and lower transparency, which also offers novel suggestions for improving CEO selection and governance in public firms.

Finally, while this paper highlights the value of hometown connections, investors will always favor a good legal system and a stable social environment, and an excellent external environment can minimize society's total costs. In addition, this paper also proposes policy implications for regulators and local governments.

The rest of the paper is organized as follows. Section 2 discusses relevant literature and develops our hypotheses. Section 3 describes the sample selection and research design. Section 4 presents and discusses the empirical results. Section 5 discusses the influencing mechanism of CEO hometown connections. Section 6 reports and discusses the results of some robustness tests. Section 7 concludes and discusses policy implications.

2. Literature review and hypothesis development

2.1. Literature review on analyst optimism

There are two main types of perspectives in the extant literature regarding the causes of the optimism bias in analysts' earnings forecasts.

The first category of viewpoints asserts that analyst optimism bias stems form analyst cognitive bias. According to De Bondt and Thaler (1990), analysts overreact to positive market news while underreacting to negative market news (Klein, 1990; Abarbanell, 1991; Abarbanell and Bernard, 1992). Easterwood and Nutt (1999) combine overreaction and underreaction, and discover that analysts can under-react to negative news and overreact to positive news when perceiving new information, resulting in systematic optimism bias in analysts' forecasts. Furthermore, information asymmetry between firms and analysts exacerbates this bias, particularly when firms fail to fully disclose negative information, leaving analysts without sufficient resources to produce less optimistic forecasts (Lang and Lundholm, 1996).

The second category of viewpoints argues that analyst optimism bias stems from conflicts of interest, primarily between (1) analysts and their employers (such as investment banks, Securities firms, and insurance companies, etc.), (2) analysts and employers' clients, and (3) analysts and firm management.

Analysts' employers and employers' clients can have a decisive impact on their compensation (Michaely and Womack 1999; Irvine, 2004; Agrawal and Chen, 2008) and career development (Stickel, 1992; Hong and Kubik, 2003). With the pressure of brokerage commissions and employers' business, analysts are urged to issue more optimistic earnings forecasts (Agrawal and Chen, 2012; Mola and Guidolin, 2009; Cowen et al., 2006; Jackson, 2005; Irvine, 2004;). In particular, analysts are inclined to present overly optimistic views of public firms to maintain strong client relationships and maximize revenue (Lin and McNichols, 1998; Kolasinski and Kothari, 2008; Michaely and Womack, 1999; Gu et al., 2013).

Conflicts of interest between analysts and company management stems mainly from the tension between the executives' self-interest motives and analysts' demand for reliable information. Executives often favor optimistic forecasts to enhance their personal gains (Lim, 2001), while analysts rely on management as a crucial channel for accessing private company information (Das et al., 1998; Richardson et al., 2004; Ke and Yu, 2006). In order to gain better access to firms' private information, analysts are forced to issue positively biased opinions to curry favor with management (Francis and Philbrick, 1993; Malloy, 2005).

Based on these perspectives, we propose two plausible mechanisms for the impact of CEO hometown connections on analysts' earnings forecast optimism: the information advantage afforded by the CEO and the potential for CEO moral hazard.

2.2. Literature review on informal institution

A specific example of an informal institution is the hometown relationship between CEOs and suppliers. This form of informal institution, deeply embedded in local networks and social ties, significantly influences corporate decision-making and behavior (Uzzi, 1997). For instance, CEOs may prefer suppliers from their own hometowns due to long-standing personal relationships and established trust (M. M. Granovetter, 2005; Stolper and Walter, 2019), which can affect procurement decisions and supply chain management. As such, hometown connections function as informal institutions that leverage local social networks and mutual trust to impact corporate practices.

The impact of informal institutions on corporate behavior and analyst forecasts has increasingly attracted scholarly attention. Firstly, informal institutions significantly affect corporate behavior by shaping governance structures and decision-making processes. Estrin and Prevezer (2011) emphasize that informal institutions can compensate for formal institutional deficiencies, particularly in emerging economies. In countries like China, where legal systems may be underdeveloped, informal institutions often serve as substitutes, enhancing corporate governance and improving the investment environment. Similarly, Zhao and Hao (2021) and Lyu et al. (2023) demonstrate that social trust, as an informal institution, promotes corporate innovation and alleviates financial constraints, especially in weak legal contexts. These findings suggest that informal institutions indirectly influence corporate market performance by bolstering innovation capacity and financial stability.

Regarding analyst behavior, the influence of informal institutions is also significant. Pan et al. (2022) find that social trust can reduce analysts' forecast errors and dispersion, thereby improving forecast quality. This improvement occurs because social trust enhances firms' information environment, allowing analysts to access more reliable data. Bae et al. (2020) further explore the relationship between societal trust and the informativeness of analyst research. Their findings reveal that in high-trust environments, analysts are more likely to adopt transparent and credible research methodologies, resulting in more effective forecasts. Additionally, Seyoum (2011) highlights the role of informal institutions, such as corruption and cultural norms, in influencing investment flows, which also impacts analysts' predictions of corporate performance. Therefore, informal institutions affect not only internal corporate governance and behavior but also analyst forecasting accuracy and research quality by altering the information environment and trust levels.

2.3. Hypothesis development

In the context of Chinese culture, the "hometown effect" significantly influences corporate behavior, rooted in profound social and cultural traditions. Chinese society has long been characterized by a "guanxi" culture, where interpersonal relationship networks are pivotal in resource allocation and decision-making processes. As a nation with a deep sense of hometown identity, emotional attachment to one's hometown is intricately woven into traditional Chinese culture, shaping individuals' thoughts and behaviors profoundly. From Li Bai's poetry, such as "I raise my eyes to the moon" (with the moon symbolizing reunion and nostalgia), to Xi Murong's Nostalgia, expressions of hometown sentiment permeate Chinese literature. Concrete manifestations of this sentiment, such as the "Spring Festival travel rush," underscore its enduring relevance in contemporary Chinese society (Qin et al., 2021). Centuries of Confucian influence have further reinforced this rural sentiment, embedding it deeply within both individual and organizational decision-making processes. In this context, hometown identity functions as a critical informal institution that shapes not only daily life but also corporate management and market activities (He and Yang, 2021).

Empirical studies highlight that hometown ties can significantly drive local economic development through preferential resource allocation and policy support by officials (Zhang et al., 2012; Fan et al., 2016). A parallel mechanism operates within the corporate domain. For example, CEOs have been shown to exhibit a propensity to establish subsidiaries or make investments in their hometowns, illustrating the crucial role of hometown ties in shaping resource distribution and corporate behavior (Cao et al., 2018). The trust-based foundations and strong relational attributes inherent in hometown connections facilitate resource access and influence external stakeholders' perceptions and judgments, such as those of analysts. These ties embody cultural identity and emotional bonds, offering a trust-based foundation and a network that fosters corporate cooperation. Unlike typical market relationships, hometown ties prioritize long-term collaboration and reciprocal behavior while imposing behavioral constraints on participants. Additionally, they can alleviate information asymmetry between suppliers and company management, reducing external observers' concerns regarding the authenticity of information.

Existing literature indicates that the relationship between officials and their hometowns can substantially promote local economic development through preferential resource allocation and policy support (Zhang et al., 2012; Fan et al., 2016). A similar mechanism is applicable at the corporate level. For instance, studies have demonstrated that CEOs are more inclined to establish subsidiaries or make investments in their hometowns, illustrating the significant role of hometown ties in resource distribution and corporate behavior (Cao et al., 2018). The trust-based foundation and strong relational attributes inherent in hometown connections not only facilitate access to resources but also influence the perceptions and judgments of external stakeholders, such as analysts. Hometown relationships embody both cultural identity and emotional bonds, providing a foundation of trust and a network of relationships that facilitate corporate cooperation. This relationship culture emphasizes long-term collaboration and reciprocal behavior, while also imposing certain behavioral constraints on participants. In contrast to typical market relationships, hometown ties can mitigate information asymmetry between suppliers and company management, thus alleviating concerns about the authenticity of information among external observers.

Information asymmetry and CEO moral hazard are the leading causes of conflicts of interest between executives and analysts (Lung and Lundholm, 1996; Barron et al., 1999; Byard and Shaw, 2003; Lim, 2001). Analysts' information resources mainly come from (1)

firm financial reports and other company public information, (2) industry and macro public information, and (3) company management. Apart from company and industry public information, management, as a key avenue for analysts to access private information about public firms, has a significant impact on analyts' earnings forecasts (Das et al., 1998; Richardson et al., 2004; Ke and Yu, 2006; Ramnath et al., 2008). We propose two possible hypotheses by summarizing the preceding literature: (1) CEO hometown connections with suppliers can offer CEOs with additional information advantages, and analysts can lessen information asymmetry by engaging with CEOs, reducing analysts' optimism bias, (2) while CEO's preference for hometown may also be motivated by personal interests, leading agency problem of public firm, it will further reinforce the existence of conflict of interest between analysts and CEOs, increasing the analysts' optimism bias.

First, the establishment of business partnerships between CEOs and suppliers can facilitate information exchange, reduce information asymmetry, and aid in the reduction of uncertainty between the parties (Uzzi and Lancaster, 2003). Furthermore, Uzzi (1996) finds that CEOs who work with hometown suppliers are more informed than those who do not, and social networks from CEOs' hometown can aid them in expanding their company's investment opportunities and optimizing the use of its resources (Cartwright and Cooper, 1993; Pool et al., 2012). This is consistent with findings by Eshleman and Guo (2014), who demonstrate that market participants use suppliers' earnings announcements to anticipate customer firms' performance, showing the value of upstream information flows. In this context, hometown connections further facilitate the exchange of privileged information within the supply chain, leading to better forecasts. Similarly, Guan et al. (2015) highlight that analysts tracking both suppliers and customers within the same supply chain are better able to predict earnings by utilizing complementary information. The improved information quality and transparency of a listed firm brought about by CEO hometown connections will serve as better sources of information to analysts, lower the analysts' information collection costs, and reduce analysts' optimism bias (Xiao et al., 2017), for example, analysts can interview CEOs and their hometown suppliers, and CEOs with information advantages can provide analysts more information with higher quality (such as stable supply chains and low-risk investment opportunities in hometown), which will improve the accuracy of analysts' access to information, thus reducing the optimistic bias of the analysts' earnings forecasts.

Second, by joining the hometown network, firms can verify the information obtained, thereby lowering information costs and opening a channel for suppliers to monitor public companies (Podolny, 1994; Hegde and Tumlinson, 2014). Moreover, CEOs' connections with suppliers from hometown province can boost their own reputation and external trust (Barden and Mitchell, 2007; Chen and Chen, 2004). Luo and Nagarajan (2015) argue that analysts who specialize in tracking supply chains benefit from greater information complementarity between companies, suggesting that CEO-supplier ties in a hometown context could further enhance this effect. In contrast to other developed countries (e.g., UK, US, and Germany), China is a typical "Guanxi" society influenced by traditional Confucianism in which social networks play a key role in economic activities. The role of informal institutions in reducing uncertainty in such networks is well-documented, as Uzzi (1997) notes that informal norms, including trust-based relationships, complement formal contracts to reduce transaction costs and risks in business partnerships. If the CEOs choose to break promises or commit fraud, they will face condemnation from hometown family and friends (Li et al., 2020), personal reputation loss (Yang, 1994), and great psychological pressure. Therefore, the hometown connection, as an informal norm (complementary to the formal contract) (Uzzi, 1997), mitigates CEO moral hazard issues (Corwin and Schultz, 2005; Ren et al., 2021), enhances the external suppliers monitoring, and helps to mitigate the conflict of interest between managers and analysts, thus reducing the optimism bias of analysts' earnings forecasts.

As an alternative, CEOs' preference for working with hometown firms or individuals may not exactly bring information advantage (Redding, 2013). Driven by the familiarity preference and personal self-interest, CEOs may overestimate the value of their investment targets and information advantage of hometown connections, triggering their overconfidence (Chung et al., 2018). Wong and Zhang (2014) found that when CEOs are overly optimistic, analysts tend to issue less accurate forecasts, suggesting that the CEO's overconfidence can distort the information flow to analysts. Therefore, analysts are more likely to issue optimistic forecasts in response to management flattery or more positive information. In addition, while CEOs may suffer significant reputational damage and condemnation from social networks of hometown for fraud and broken promises, we cannot rule out the possibility that CEOs will use the external trust and lower investigation standards built up by hometown connections for their own benefits (Gu et al., 2020; Shen et al., 2019; Fu et al., 2022).

Both arguments are possible. Therefore, the testable hypothesis has two parts:

H1a. CEOs' hometown connections with suppliers are negatively associated with analysts' optimism.

H1b. CEOs' hometown connections with suppliers are positively associated with analysts' optimism.

3. Data and research design

3.1. Data

This paper uses unbalanced panel data comprising all the Chinese listed firms in the Shanghai and Shenzhen Stock exchanges in 2009–2020. Referring to relevant existing studies (Xu et al., 2012; Kong et al., 2020; Hu et al. 2021; Hou et al. 2021), the following types of firms are excluded from our sample. (1) Firms from the financial industry. (2) the listed firms denoted ST¹ (3) Suppliers (firms)

¹ ST means special treatment in Stock Exchange, and ST firms are usually in financial abnormity.

whose names are not identified. (4) Firms whose CEOs' hometown provinces are not identified. (5) Firms with missing data. All the firm-level continuous variables are winsorized at the 1st and 99th percentiles. The final dataset retains 2288 firm-year observations.

3.2. Variables

3.2.1. Measurement of analyst optimism (Optimism)

Following Jackson (2005) and Xu et al. (2012) to construct analyst forecast optimism as:

$$Opt_{ijt} = \frac{\left(F_{ijt} - A_{it}\right)}{P_{\cdot}} \tag{1}$$

Where F_{ijt} represents the analyst j forecasted earnings per share for year t of firm i, and A_{it} is the actual earnings per share of firm i in year t. P_i is the stock price on the trading day prior to the earnings forecast.

The $Optimism_{it}$ is measured as the total number of analysts with Opt_{ijt} greater than 0 divided by the total number of analysts of firm i in year t. The larger the $Optimism_{it}$ is, the greater the optimism bias of analysts is.

3.2.2. CEO hometown connection (Homesup)

Referring to Kong et al. (2020), the key explanatory variables of hometown connection are constructed as an indicator to measure the connection between CEOs and the top five suppliers registered in CEOs' hometown provinces.

Firstly, all the data on the firms' top five suppliers are from the China Stock Market and Accounting Research Database (CSMAR). Based on the principle of commercial confidentiality, some listed firms do not disclose other information, such as the names of suppliers, except the purchase amount. Consequently, only some suppliers registered in the CEO hometown provinces are identified. Secondly, the registered provinces of the top five suppliers are manually collected by the authors through the National Enterprise Credit Query System(https://www.qcc.com/). the data of CEOs' hometown provinces is also collected from firms' public announcements, firm-related news, telephone interview of the Secretary of the Board, and search engines (such as Baidu, Google, and Sina etc.). The top five suppliers registered in CEOs' hometown provinces are identified to calculate their percentage shares in the total amount of procurement made by a particular CEO with hometown connections. If the CEO hometown province is consistent with the supplier registered province, there are defined as "hometown suppliers". Summing up all the shares of the listed firms purchased from hometown suppliers to define a continuous variable *Homesup*. Alternatively, a dummy variable *Home* can be used to represent hometown connection, taking the value of 1 if suppliers are registered in CEOs' hometown provinces, other 0 otherwise.

In this paper, the continuous variable *Homesup* is used as the key explanatory variable for analyst optimism bias as it contains more information than a simple dummy variable *Home*. For the robustness test, however, *Home* is also used to replace *Homesup* to make sure that the regression results are reliable and consistent.

3.3.3. Other controlled variables

Following the study of Hu et al.(2021) and Hou et al.(2021), the following variables are deployed as control variables: Sales growth ($Growth_{it-1}$), return on total assets (ROA_{it-1}), firm-specific financial leverage (Lev_{it-1}), book to market value ratio (BM_{it-1}), firm-specific size ($Size_{it-1}$), analyst following ($Follow_{it-1}$), Institutional investors ownership($INST_{it-1}$), listing years($Listage_{it-1}$), forecast horizon ($Horizon_{it-1}$), stock turnover($Turnover_{it-1}$), earning management($Abacc_{it-1}$), stock return volatility($Volatility_{it-1}$). Appendix A presents the detail definition of all variables. In addition, we also include CEO characteristics, firm fixed effects and year fixed effects to control any variation in CEO-specific, firm-specific, or time characteristics.

3.3. Model specification

Referring to previous studies (Xu et al.,2012; Kong et al.,2020; Hu et al. 2021; Hou et al. 2021), after controlling the fixed effects of firms and year, a CEO hometown connection index (*Homesup*) is included in the model to examine its effect on analysts' optimism bias in earnings forecasts. The basic model is defined in Eq. (2).

$$Optimism_{it} = \alpha_0 + \alpha_1 HOMESUP_{it-1} + \gamma' X_{it-1} + \varepsilon_{it}$$
(2)

Where I and t represent firm and year respectively, $Optimism_{it}$ represents the optimism bias of analysts in a public firm. The key independent variable is Homesup which represents CEO hometown connection. X_{it-1} is a set of controlled variables. ε_{it} is a residual term that obeys the standard normal distribution and is independent of all the right-hand side variables. In the regression model, the impact of other factors on analysts' optimism bias are effectively controlled, so as to investigate the impacts of CEO hometown connection on Optimism. If α_1 is negative and significant, it implies that the CEO hometown connection will reduce the optimism bias of analyst earnings forecasts. If α_1 is positive and significant, it implies that the CEO hometown connection will increase the analysts' optimism bias in earnings forecasts.

² With implementation of the Cybersecurity Law and Personal Information Protection Law, the Chinese government has strengthened the protection of personal information, causing certain obstacles to our data work, therefore, we only obtained a cut of the data of CEO birthplace in China's public firms.

4. Empirical results and analysis

4.1. Descriptive statistics and correlation analysis

The descriptive statistics for the relevant variables are shown in Table 1. Regarding CEO hometown connections, the sample average value is approximately 11.6% per firm-year, with a standard deviation of 0.172. It has also been discovered that many firms do not select suppliers from CEO hometowns, despite the fact some firms have a hometown connection as high as 1. The mean value of *Optimism* is 0.812, which is consistent with the previous research results (Xu et al., 2012; Li et al., 2016; Zheng, 2019) and the current state of China.

Table 2 shows the Pearson and Spearman correlation coefficients among the relevant variables. The CEO hometown connection indicator (Homesup) shows a significantly negative correlation with the analysts' optimism bias in earnings forecasts indicators (Optimism), with the Pearson correlation coefficient of -0.080, significant at 1% level. The Spearman correlation coefficient is -0.054, which is also significant at the 1% level.

4.2. Univariate test

Table 3 presents the results of the univariate tests. In this section, we compare the analysts' optimism bias in earnings forecasts ($Optimism_{it}$) and the other controlled regression variables (financial characteristics of the firm and CEO) between firms with and without hometown connections. We calculate the mean value of the optimism measure for firms with and without hometown connections. Table 3 demonstrates a decreasing trend in optimism indicator as firms with CEO hometown connections with suppliers, confirming the hypothesis that CEO hometown connection may lead to a lower analysts' optimism bias in earnings forecasts. The difference for the optimism indicator is 0.023, which is statistically significant at the 5% level.

4.3. Empirical results

We examine whether CEOs' hometown connections influence analysts' optimism bias earnings forecasts and report the baseline regression results in Table 4. The results in column (1) only contain the dependent variable $Optimism_{it}$ and the independent variable $Optimism_{it}$ and $Optimism_{it}$ and $Optimism_{it}$ and $Optimism_{it}$ and $Optimism_{it}$ and $Optimism_{it}$ in column (2) and $Optimism_{it}$ in column (3), indicating that CEO hometown connection may reduce the optimism in analyst earnings forecasts.

Regarding the control variables, Hu et al. (2021) believe that the analysts' optimism bias in earnings forecasts will decrease to counter higher firm leverage, larger size, and greater analyst following. Because the highly leveraged firms, larger firms, and firms with greater analysts following are perceived to have a better information environment, greater scrutiny, and increased monitoring (Hutton et al., 2012). The estimated coefficients of firm leverage (Lev_{it-1}), firm size ($Size_{it-1}$), and analyst following ($Follow_{it-1}$) are all negative and significant, indicating that highly leverage firms, larger firms, and firms with more analysts following are more likely to have lower optimism in analyst earnings forecasts. The coefficient of Institutional investor ownership ($INST_{it-1}$) is negative and significant, implying a higher ratio of institutional ownership leads to a lower optimism in analyst earnings forecasts, which is consistent with

Table 1Summary statistics of relevant variables (number of observations=2288).

Variables	mean	sd	min	p25	p50	p75	max
Optimism _{it}	0.812	0.266	0.000	0.711	0.941	1.000	1.000
Homesup _{it-1}	0.116	0.172	0.000	0.000	0.042	0.164	1.000
Growth _{it-1}	0.226	0.927	-0.862	-0.015	0.109	0.261	21.007
ROA_{it-1}	0.038	0.065	-0.797	0.015	0.036	0.062	0.590
Lev_{it-1}	0.453	0.201	0.008	0.296	0.446	0.615	1.055
BM_{it-1}	0.641	0.258	0.021	0.428	0.649	0.843	1.300
$Size_{it-1}$	22.380	1.233	18.468	21.529	22.206	23.087	26.574
$Follow_{it-1}$	1.917	0.866	0.693	1.099	1.946	2.565	4.078
$INST_{it-1}$	0.100	0.108	0.000	0.027	0.071	0.136	0.953
Listage _{it-1}	2.359	0.583	1.386	1.946	2.350	2.890	3.367
Horizon _{it-1}	6.213	0.399	2.485	6.042	6.281	6.477	7.239
Turnover _{it-1}	0.479	0.361	0.013	0.223	0.377	0.624	2.347
$Abacc_{it-1}$	0.083	0.164	0.000	0.025	0.050	0.097	3.084
Volatility _{it-1}	0.131	0.070	0.020	0.089	0.116	0.152	1.070
CEO_Fem_{it-1}	0.051	0.220	0.000	0.000	0.000	0.000	1.000
CEO_age_{it-1}	3.916	0.130	3.367	3.850	3.932	3.989	4.344
CEO_edu _{it-1}	0.907	0.291	0.000	1.000	1.000	1.000	1.000
CEO_pay _{it-1}	12.913	2.046	0.000	12.724	13.171	13.592	16.497
CEO_ratio _{it-1}	0.040	0.104	0.000	0.000	0.000	0.008	0.771
CEO_dual _{it-1}	0.212	0.408	0.000	0.000	0.000	0.000	1.000

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Table 2Correlation coefficient of relevant variables.

	$Optimism_{it}$	$Homesup_{it}$	$Growth_{it-1}$	ROA_{it-1}	Lev _{it-1}	BM_{it-1}	$Size_{it-1}$	$Follow_{it-1}$	$INST_{it-1}$	$Listage_{it-1}$	$Horizon_{it-1}$	Turnover _{it-1}	$Abacc_{it-1}$	Volatility _{it-1}
Optimism _{it}		-0.054***	-0.100***	-0.098***	-0.091***	-0.057***	-0.132***	-0.163***	-0.159***	-0.096***	0.129***	0.127***	0.061***	0.035*
Homesup _{it-1}	-0.080***		-0.105***	-0.048**	0.045**	0.090***	0.005	-0.050**	-0.089***	0.068***	-0.009	-0.054**	-0.030	-0.056***
$Growth_{it-1}$	-0.041*	-0.045**		0.282***	-0.005	-0.105***	-0.010	0.201***	0.176***	-0.144***	-0.223***	0.008	0.076***	-0.008
ROA_{it-1}	-0.027	-0.042**	0.087***		-0.432***	-0.327***	-0.160***	0.381***	0.220***	-0.123***	-0.221***	-0.086***	0.042**	-0.068***
Lev_{it-1}	-0.133***	0.044**	-0.009	-0.320***		0.469***	0.557***	-0.030	0.014	0.293***	-0.002	-0.167***	0.031	-0.058***
BM_{it-1}	-0.079***	0.093***	-0.043**	-0.196***	0.457***		0.635***	-0.100***	-0.177***	0.279***	0.219***	-0.358***	-0.112***	-0.385***
$Size_{it-1}$	-0.145***	0.031	-0.020	-0.054***	0.563***	0.642***		0.212***	0.137***	0.478***	0.028	-0.414***	-0.078***	-0.242***
$Follow_{it-1}$	-0.039*	-0.063***	0.022	0.314***	-0.034	-0.103***	0.235***		0.450***	-0.092***	-0.318***	-0.106***	0.014	-0.043**
$INST_{it-1}$	-0.112***	-0.103***	0.019	0.180***	0.018	-0.139***	0.136***	0.363***		0.005	-0.266***	-0.100***	0.010	0.029
$Listage_{it-1}$	-0.131***	0.098***	-0.004	-0.048**	0.300***	0.273***	0.450***	-0.090***	0.019		-0.062***	-0.306***	-0.060***	-0.169***
$Horizon_{it-1}$	0.101***	-0.019	-0.141***	-0.136***	-0.021	0.189***	0.049**	-0.152***	-0.157***	-0.084***		-0.094***	-0.059***	-0.122***
Turnover _{it-1}	0.099***	-0.060***	0.004	-0.064***	-0.159***	-0.344***	-0.375***	-0.114***	-0.101***	-0.308***	-0.095***		0.095***	0.596***
$Abacc_{it-1}$	0.018	-0.027	0.285***	-0.057***	0.053**	-0.066***	-0.038*	0.017	0.012	-0.013	-0.099***	0.047**		0.115***
Volatility _{it-1}	-0.002	-0.060***	0.050**	-0.048**	-0.074***	-0.394***	-0.220***	-0.045**	0.007	-0.154***	-0.129***	0.518***	0.082***	

Notes: Lower-triangular cells report Pearson's correlation coefficient, upper-triangular cells are Spearman's rank correlation, *** p < 0.01, ** p < 0.05, * p < 0.1.

Table 3 Univariate test.

Variables	Home=0		Home=1	Home=1		
	N	mean	N	mean	Difference	
Optimism _{it}	876	0.826	1412	0.804	0.023**	
Growth _{it-1}	876	0.282	1412	0.191	0.091**	
ROA _{it-1}	876	0.041	1412	0.036	0.004	
Lev _{it-1}	876	0.44	1412	0.461	-0.021**	
BM_{it-1}	876	0.613	1412	0.658	-0.045***	
Size _{it-1}	876	22.397	1412	22.369	0.027	
Follow _{it-1}	876	1.945	1412	1.899	0.046	
INST _{it-1}	876	0.108	1412	0.095	0.013***	
Listage _{it-1}	876	2.328	1412	2.378	-0.049**	
Horizon _{it-1}	876	6.217	1412	6.211	0.007	
Turnover _{it-1}	876	0.497	1412	0.467	0.029*	
Abacc _{it-1}	876	0.092	1412	0.078	0.014**	
Volatility _{it-1}	876	0.136	1412	0.127	0.009***	
CEO_Fem _{it-1}	876	0.062	1412	0.045	0.017*	
CEO_age _{it-1}	876	3.912	1412	3.919	-0.006	
CEO_edu _{it-1}	876	0.945	1412	0.883	0.062***	
CEO_pay _{it-1}	876	13.001	1412	12.858	0.143	
CEO_ratio _{it-1}	876	0.059	1412	0.029	0.030***	
CEO_dual _{it-1}	876	0.226	1412	0.203	0.023	

Table 4
CEO hometown connection and analyst optimism.

Variables	Optimism		
	(1)	(2)	(3)
Homesup _{it-1}	-0.169***(-2.81)	-0.127**(-2.14)	-0.125**(-2.11)
Growth _{it-1}		-0.010(-1.09)	-0.010(-1.10)
ROA _{it-1}		0.158(1.23)	0.160(1.27)
Lev _{it-1}		-0.424***(-4.57)	-0.426***(-4.69)
BM_{it-1}		-0.048(-0.64)	-0.044(-0.59)
Size _{it-1}		0.144***(4.00)	0.143***(3.97)
Follow _{it-1}		0.042**(2.56)	0.041**(2.52)
INST _{it-1}		-0.354***(-2.58)	-0.353**(-2.52)
Listage _{it-1}		0.099(1.20)	0.109(1.32)
Horizon _{it-1}		0.039(1.55)	0.039(1.58)
Turnover _{it-1}		-0.006(-0.19)	-0.007(-0.24)
Abacc _{it-1}		0.058(1.64)	0.059(1.62)
Volatility _{it-1}		-0.234(-1.51)	-0.213(-1.37)
CEO_Fem _{it-1}			0.017(0.32)
CEO_age _{it-1}			-0.066(-0.75)
CEO_edu _{it-1}			-0.082**(-2.06)
CEO_pay _{it-1}			0.010***(2.58)
CEO_ratio _{it-1}			-0.051(-0.45)
CEO_dual _{it-1}			-0.012(-0.40)
constant	0.682***(10.12)	-2.525***(-3.82)	-2.348***(-3.29)
year	yes	yes	yes
firm	yes	yes	yes
N	2288	2288	2288
F	5.826	6.215	5.471
Adj_R ²	0.0326	0.0912	0.0966

previous studies (Hou et al., 2021). Furthermore, Tilianyi et al. (2000) suggest that CEOs with higher educational backgrounds have better access to information, and the coefficient of CEOs with a bachelor degree (or above) is statistically significant and negative, implying that CEOs with higher education background will reduce the analysts' optimism bias in earnings forecasts. CEO compensation, on the other hand, is more likely to be the result of authority rent-seeking, and higher compensation will increase the agency costs of firms (Bebchuket al., 2002; Wu and Wu, 2010). The positive and significant coefficient for CEO compensation suggests that analysts tend to make more optimistic forecasts for firms with higher CEO compensation.

5. Mechanism discussion: information advantage and an informal norm

In the hypothesis development of this paper, we attribute the mechanism of CEO hometown connection affecting the optimism bias of analysts' earnings forecasts to the information advantage. Furthermore, as an informal institutional factor, CEO hometown connections can mitigate CEO moral hazard, thereby reducing analysts' optimism bias. Although the baseline regression results support the hypothesis that CEO hometown connections with suppliers are negatively associated with analysts' optimism, the precise roles of information advantage and informal institutional effects in this relationship remain unclear. Therefore, we further examine whether the "hometown effect" is more pronounced in firm with lower-quality information disclosure, lower transparency, lower-quality auditing, higher agency costs, and in regions with weaker market environment. These findings aim to elucidate the underlying mechanisms through which CEO hometown connections influence analysts' optimism bias.

5.1. Information advantage: improving information quality and increasing transparency

CEO hometown connections can facilitate information exchange, reduce information asymmetry, help companies obtain more informational advantages, and aid in the reduction of uncertainty between the parties (Uzzi and Lancaster, 2003; Uzzi, 1996). Better information quality and transparency brought by CEO hometown connections will decrease the analysts' information collection costs, improve the quality of analysts' earnings forecasts, and reduce the analysts' optimism bias in earnings forecasts (Xiao et al., 2017). Hometown connections between CEOs and suppliers further enhance this information exchange, reducing information asymmetry and granting analysts access to privileged insights. Uzzi (1996) highlights that CEOs with hometown supplier connections are better informed, using their networks to maximize investment opportunities and optimize resource allocation (Cartwright and Cooper, 1993; Pool et al., 2012). This helps analysts gather complementary information from both suppliers and customers, as Eshleman and Guo (2014) note, allowing them to better predict company performance, which reduces the likelihood of overly optimistic forecasts (Guan et al., 2015). If the inhabiting effects of CEO hometown connections on the analysts' optimism bias in earnings forecasts are more pronounced among firms with lower-quality of information disclosure and lower transparency, this would further validate the proposed mechanism rooted in information advantage.

5.1.1. Information disclosure quality

The data sample is then divided into two groups: firms with high-quality of information disclosure versus firms with lower-quality of information disclosure, and the regression results are shown in Table 5. The findings support reasoning mechanism that the negative relationship between CEO hometown connection and the analysts' optimism bias in earnings forecasts is more pronounced for firms with lower-quality of information disclosure.

5.1.2. Information transparency of company

we divided our sample into two sub-samples: firms with higher transparency versus firms with lower transparency, and the results are shown in Table 6. It demonstrates that CEOs' hometown connections are more significantly and negatively related to the analysts' optimism bias in earnings forecasts in public firms with lower transparency.

5.2. An informal norm: enhancing external monitoring and reducing CEO moral hazard problems

In essence, hometown connections between CEOs and suppliers complement the contracts signed by both parties and are more common in emerging markets with weaker legal systems (Allen et al., 2005). As noted by Guisoet al. (2004), hometown connections, as an informal institution (contract), serve as an alternative norm in less favorable market environments. Hometown networks play a crucial role in supplementing formal contracts by addressing gaps in the legal and regulatory framework. Uzzi (1997) highlights that these informal norms, including trust-based relationships, reduce transaction costs and mitigate risks by enhancing monitoring and accountability. This is particularly significant in environments with weaker legal systems, where formal contracts alone may not suffice. Hometown networks provide a platform for verifying information, fostering mutual trust, and ensuring that firms adherence to agreed terms. If CEOs engage in fraudulent activities or breach promises, the social and reputational repercussions from their hometown networks—such as condemnation from local communities and loss of personal reputation—serve as a powerful deterrent (Li et al., 2020; Yang, 1994). Thus, these informal networks help mitigate moral hazard, improve external monitoring by suppliers, and reduce conflicts of interest between managers and analysts, which in turn decreases analysts' optimism bias in earnings forecasts (Corwin and Schultz, 2005; Ren et al., 2020).

In regions with weaker external market environments or relaxed monitoring, the reputation and information advantages from hometown connections enable CEOs to gain more external trust and resources. These connections also provide suppliers with a new channel for monitoring the company, thereby reducing analysts' optimism bias in earnings forecasts. In Section 5.2.1 and 5.2.2, we analyze the role of hometown connections as an informal institution in business using the marketability index and external audit to represent the firm's external regulatory environment.

Table 5Mechanism discussion: information disclosure quality.³

Variables	Optimism			
	(1)	(2)		
	$Quality_{it-1} = 1$	$Quality_{it-1} = 0$		
Homesup _{it-1}	-0.057(-0.54)	-0.133*(-1.82)		
Growth _{it-1}	-0.0001(-0.01)	-0.064**(-2.49)		
ROA _{it-1}	0.326(1.36)	0.260(1.17)		
Lev _{it-1}	-0.334**(-2.27)	-0.594***(-4.43)		
BM_{it-1}	-0.095(-0.77)	0.051(0.45)		
Size _{it-1}	0.192***(3.04)	0.089*(1.79)		
Follow _{it-1}	0.043(1.61)	0.053**(2.07)		
INST _{it-1}	-0.004(-1.50)	-0.004**(-2.10)		
Listage _{it-1}	0.190(1.44)	0.172(1.49)		
Horizon _{it-1}	0.0045(0.11)	0.055(1.31)		
Turnover _{it-1}	0.016(0.30)	-0.002(-0.02)		
Abacc _{it-1}	0.083(1.28)	0.239(1.44)		
Volatility _{it-1}	-0.441**(-1.98)	0.164(0.57)		
CEO_Fem _{it-1}	0.050(0.49)	-0.046(-0.69)		
CEO_age _{it-1}	-0.088(-0.62)	-0.036(-0.31)		
CEO_edu _{it-1}	-0.024(-0.27)	-0.070(-1.11)		
CEO_pay _{it-1}	0.011*(1.72)	0.007(1.31)		
CEO_ratio _{it-1}	0.136(0.63)	0.097(0.64)		
CEO_dual _{it-1}	-0.016(-0.28)	-0.032(-0.99)		
constant	-3.250***(-2.60)	-1.456(-1.51)		
year	yes	yes		
firm	yes	yes		
N	1185	1103		
F	3.363	4.018		
Adj_R ²	0.126	0.127		
Empirical p-value	0.086*			

The following section, Section 5.2.3, discusses the effect of CEO hometown connections on CEO moral hazard issues. The more severe the company's agency problem, the larger the management's moral hazard and self-interested issues, as well as the agency costs (Kothari et al., 2009; Lin and Zheng, 2016; Wu et al., 2019). The agency costs index reflects the moral hazard issues of managers in listed companies. When CEOs benefit from the reputation and trust of their hometown connections, it is hard for CEOs to break promises or commit fraud. As an informal norm, CEO hometown connections will mitigate CEO moral hazard issues, defuse the conflict of interest between managers and analysts, and lower the optimism bias of analysts' earnings forecasts.

If the negative relationship between CEO hometown connections and the analysts' optimism bias in earnings forecasts are more pronounced among firms with lower-quality auditing, greater agency costs and firms in provinces with weaker marketization, we can validate the mechanistic reasoning about the informal norm.

5.2.1. Market environment

The data sample is divided into two groups based on the level of a standardized marketization index which fluctuates around 0. If the value is greater than 0, it indicates a better market environment. Conversely, if it is less than 0, it reflects a weaker market environment. Table 7 reports the regression results. In regions where the market environment is weaker, the effect of CEO hometown connections on the reduction of analyst optimism bias is more pronounced.

5.2.2. External monitoring

In China, the "Big Four" or overseas auditors are generally regarded as more neutral and objective. Their involvement is often associated with higher-quality external oversight, providing a more stringent and reliable monitoring environment (Callen and Fang, 2017). The data sample is then divided into two groups: firms audited by the "Big Four" or oversea auditors and not audited by the "Big Four" or oversea auditors, Table 8 reports the regression results. It is found that the CEO hometown connections are more significant in reducing analysts' optimism bias in earning forecasting in public firms not audited by the "Big Four" or overseas auditors.

³ Information disclosure quality: Kim and Verrecchia (2001) develop the KV index to reflect the market's reliance on trading information. This index can also objectively reflect the quality of information disclosure of listed companies. The higher the KV index, the greater the investor's reliance on trading information and the lower the investor's reliance on information disclosure quality of listed companies. Quality_{it-1} equals 1 if the KV index is lower than the year-industry median KV index, see Appendix B.3 for details.

Table 6Mechanism discussion: information transparency. 4

Variables	Optimism			
	(1)	(2)		
	$\mathit{Transparency}_{\mathit{it-I}} = 1$	$Transparency_{it-1} = 0$		
Homesup _{it-1}	0.065(0.51)	-0.281***(-3.46)		
Growth _{it-1}	0.003(0.15)	-0.028**(-2.50)		
ROA _{it-1}	1.068**(2.56)	0.349(1.59)		
Lev _{it-1}	-0.158(-0.84)	-0.575***(-3.79)		
BM_{it-1}	0.105(0.83)	-0.303**(-2.27)		
Size _{it-1}	0.028(0.43)	0.258***(4.76)		
Follow _{it-1}	0.080***(2.73)	0.003(0.13)		
INST _{it-1}	-0.004(-1.45)	-0.006***(-3.12)		
Listage _{it-1}	0.294*(1.67)	0.179(1.16)		
Horizon _{it-1}	0.086**(2.17)	0.016(0.32)		
Turnover _{it-1}	-0.037(-0.53)	-0.035(-0.60)		
Abacc _{it-1}	-0.046(-0.67)	0.058(1.45)		
Volatility _{it-1}	0.199(0.61)	-0.157(-0.78)		
CEO_Fem _{it-1}	-0.134(-1.22)	0.029(0.38)		
CEO_age _{it-1}	0.109(0.73)	0.023(0.17)		
CEO_edu _{it-1}	-0.097**(-2.05)	-0.193***(-2.88)		
CEO_pay _{it-1}	0.015**(2.24)	0.008*(1.88)		
CEO_ratio _{it-1}	-0.346(-1.33)	-0.223(-0.98)		
CEO_dual _{it-1}	-0.064(-0.91)	0.007(0.12)		
constant	-1.806(-1.30)	-4.765***(-4.50)		
year	yes	yes		
firm	yes	yes		
N	950	1145		
F	2.642	4.756		
Adj_R ²	0.141	0.163		
Empirical p-value	0.029**			

5.2.3. Agency costs

The data sample is then divided into two groups: firms with higher agency costs versus firms with lower agency costs. Table 9 reports the regression results, CEO hometown connections are more significant in reducing the analysts' optimism bias in earning forecasting in public firms with higher agency costs.

6. Robustness test

6.1. Alternative measures of independent variables

In this section, we use a dummy variable *Home* defined in the Section 3.2.2 as a substitute for *Homesup*. Table 10 reports the regression results of dummy variable *Home*. the estimated coefficients of Home $_{it-1}$ in column (1), column (2) and column (3) are all significant at the 5% level, -0.038 for column (1), -0.040 for column (2) and -0.038 for column (3), indicating that CEO hometown connection still can reduce the optimism bias in analysts' earnings forecasts.

6.2. sample selection bias

When analysts track listed companies, they only observe the industries and target companies they are interested in. This raises the issue that some listed companies are not tracked by analysts, meaning this part of the sample is not counted. As a result, the sample may lose its randomness, and the model designed in Section 3.3 of this paper is applicable only to listed companies tracked by analysts, leading to potential bias in the conclusions.

In order to solve the problem of sample selection bias, we use the Heckman selection model to control the impact of sample selection bias on the conclusions of this paper. Barth et al. (2001) investigate the relation between analysts' incentives to cover firms and

⁴ Information transparency: Following Hutton et al. (2009), the index representing the opacity of financial report in year t-1 is calculated as the three-year moving sum of the absolute value of annual discretionary accruals (see Appendix B.1 for details). The larger the value, the higher the opacity of the company. Transparency_{it-1} equals 1 if the opacity of financial report is lower than the year-industry median opacity of financial report.

Table 7Mechanism discussion: market environment.⁵

Variables	Optimism			
	(1)	(2)		
	$\mathit{Market}_{\mathit{it-1}} = 1$	$\mathit{Market}_{\mathit{it-1}} = 0$		
Homesup _{it-1}	-0.034 (-0.42)	-0.171**(-2.27)		
Growth _{it-1}	0.012(0.87)	-0.020(-1.54)		
ROA _{it-1}	0.121(0.90)	0.582*(1.76)		
Lev _{it-1}	-0.360***(-3.62)	-0.520***(-3.40)		
BM_{it-1}	-0.015(-0.16)	-0.058(-0.48)		
Size _{it-1}	0.100**(2.20)	0.217***(3.70)		
Follow _{it-1}	0.049**(2.27)	0.033(1.41)		
INST _{it-1}	-0.461**(-2.22)	-0.241(-1.35)		
Listage _{it-1}	0.204(1.56)	0.023(0.15)		
Horizon _{it-1}	0.070*(1.91)	0.011(0.31)		
Turnover _{it-1}	-0.005(-0.14)	0.017(0.33)		
Abacc _{it-1}	0.072(1.64)	0.030(0.46)		
Volatility _{it-1}	-0.038(-0.21)	-0.651**(-2.50)		
CEO_Fem _{it-1}	0.008(0.11)	-0.033(-0.38)		
CEO_age _{it-1}	0.150(1.26)	-0.215*(-1.74)		
CEO_edu _{it-1}	-0.060(-0.88)	-0.116**(-2.08)		
CEO_pay _{it-1}	-0.006(-0.85)	0.011**(2.43)		
CEO_ratio _{it-1}	-0.078(-0.49)	0.036(0.19)		
CEO_dual _{it-1}	-0.055(-1.17)	0.026(0.61)		
constant	-2.333**(-2.30)	-2.988***(-2.72)		
year	yes	yes		
firm	yes	yes		
N	1182	1106		
F	2.504	4.980		
Adj_R ²	0.0936	0.136		
Empirical p-value	0.057*			

the extent of their intangible asset, and find that intangible assets, most of which are hard to value, are associated with greater incentives for analysts to cover such firms. Therefore, we use the intangible asset ratio as an instrumental variable. Table 11 presents the results of the Heckman selection model, showing that sample selection bias exists. However, CEO hometown connections still demonstrate a dampening effect on analysts' optimism bias in earnings forecasts. In second stage, the IMR (called Inverse Mill's Ratio or *Lambda*) calculated in the first stage was put into the regression as a control variable and passed the test. The robustness tests provide strong support for the conclusions of this paper.

6.3. Further controlling for other factors

Dowlatshahi (1999) argues that in supply and demand relationships, the party with fewer numbers holds the advantage. This implies that if a company sources a large proportion of raw materials from a single or few suppliers, fluctuations in suppliers' prices and quality can significantly impact the company's operations, and it also indicates the company's high dependency on its suppliers (Tang, 2009). Gong et al. (2022) suggest that supply chain transparency, which reflects the information environment of the upstream and downstream segments of the supply chain, indicates the market's understanding of supply chain information. This is crucial for both understanding the micro-level business decisions of firms and improving overall firm quality. Moreover, stable supplier-customer relationships can reduce transaction costs and enhance information sharing between parties (Wang and Peng, 2016), thereby facilitating external financing (Gosman et al., 2004; Cen et al., 2016). Therefore, we further controlled for several company-level factors,

⁵ Market environment: The marketization index is from 《Marketization Index of China's Provinces: NERI Report 2021》 prepared by Wang et al.(2021), and it constitutes an index system through 17 basic indexes in 5 aspects (the relationship between government and market, the development of non-state economy, the development of product market, the development of factor market, the development of market intermediary organization and legal environment). We regard it as a proxy index reflecting the marketization level in each province. And then, we standardize the marketization index, the mean value is 0. Market_{it-1} equals 1 if the marketization index is greater than 0, which means the market environment is better.

Table 8Mechanism discussion: external monitoring. ⁶

Variables	Optimism		
	(1)	(2)	
	$Audit_{it-1} = 1$	$Audit_{it-1} = 0$	
Homesup _{it-1}	-0.034(-0.15)	-0.133**(-2.05)	
Growth _{it-1}	-0.153(-1.07)	-0.009(-0.98)	
ROA_{it-1}	0.662(0.34)	0.136(1.12)	
Lev _{it-1}	-0.500(-0.70)	-0.424***(-4.63)	
BM_{it-1}	0.533(1.12)	-0.099(-1.32)	
Size _{it-1}	0.095(0.37)	0.149***(4.05)	
Follow _{it-1}	0.035(0.35)	0.045***(2.70)	
INST _{it-1}	0.217(0.38)	-0.399***(-2.68)	
Listage _{it-1}	0.334(0.53)	0.104(1.24)	
Horizon _{it-1}	0.081(0.38)	0.040(1.60)	
Turnover _{it-1}	0.314(1.30)	-0.018(-0.58)	
Abacc _{it-1}	0.154(0.23)	0.053(1.48)	
Volatility _{it-1}	0.052(0.05)	-0.207(-1.33)	
CEO_Fem _{it-1}	0.311(-0.71)	0.033(0.63)	
CEO_age _{it-1}	0.688(1.32)	-0.148*(-1.77)	
CEO_edu _{it-1}	-1.114(-1.12)	-0.089**(-2.22)	
CEO_pay _{it-1}	0.004(0.21)	0.012***(3.15)	
CEO_ratio _{it-1}	-0.283(-0.10)	-0.033(-0.28)	
CEO_dual _{it-1}	-0.211(-0.90)	-0.011(-0.35)	
constant	-5.066(-0.93)	-2.115***(-3.02)	
year	yes	yes	
firm	yes	yes	
N	132	2156	
F	1.749	5.507	
Adj_R ²	0.277	0.102	
Empirical p-value	0.000***		

including supply chain concentration (SCC_{it-1}), ⁸ supply chain transparency (SCT_{it-1}), ⁹ and supply chain stability (SCS_{it-1}). ¹⁰ After adding these variables, the regression results are shown in column (1), and the coefficients of Homesup_{it-1} is -0.166, which is significant at least at the 1% level.

Moreover, Bouteska and Mili (2022) argue that analysts tend to issue more favorable recommendations for companies with better corporate governance, and these recommendations are generally more accurate, dispersed, and optimistic in their earnings forecasts. Haw et al. (2015) find that an increase of corporate competitiveness is associated with higher analyst coverage and improved forecast accuracy. Therefore, Column (2) further incorporates additional factors that could influence analysts' forecasts, including corporate governance(CG:See Appendix B.4 for details) and corporate competitiveness(CC: See Appendix B.5 for details). After adding these variables, the regression results are shown in column (2), and the coefficients of Homesupit-1 is -0.182, which is still significant at least at the 1% level.

This provides strong support for our main empirical hypothesis (H1a), indicating that the research findings in this study are robust and reliable.

Table 12

6.4. Endogeneity test

To address the endogeneity problem, a two-stage instrumental variable estimation is conducted using the same panel data. There are two instrumental variables used in this section: the controlling shareholder ratio ($Shareholder_{it-1}$) and the higher education rate of each province in each year (Edu_{it-1}). The provincial higher education rate is measured by the proportion of people with bachelor's

 $^{^6}$ External monitoring: Audits conducted by the "Big Four" or overseas auditors can be seen as a form of high-quality external monitoring. Audit_{it-1} equals 1 if the firm is audited by Big-four or overseas auditors.

⁸ Supply chain centration: Total procurement amount of the top five suppliers/total procurement amount

⁹ Supply chain transparency: Listed companies' disclosed transaction volumes with explicitly named major suppliers and customers as a ratio of the total transaction volumes with the top five suppliers and customers.

Supply chain stability: The stability of suppliers is measured by the proportion of the top five suppliers in the current year who were also among the top five suppliers in the previous year.

Table 9Mechanism discussion: agency costs.⁷

Variables	Optimism		
	(1)	(2)	
	$Agency_{it-1} = 1$	$Agency_{it-1} = 0$	
Homesup _{it-1}	-0.297***(-2.87)	0.004(0.05)	
Growth _{it-1}	-0.047*(-1.88)	-0.013(-1.61)	
ROA _{it-1}	0.219(1.17)	0.236(0.92)	
Lev _{it-1}	-0.175(-1.23)	-0.618***(-4.95)	
BM _{it-1}	0.049(0.34)	-0.009(-0.09)	
Size _{it-1}	0.236***(3.81)	0.069(1.48)	
$Follow_{it-1}$	0.066**(2.50)	0.028(1.31)	
INST _{it-1}	-0.004(-1.46)	-0.004**(-2.31)	
Listage _{it-1}	0.130(0.91)	0.135(1.10)	
Horizon _{it-1}	0.054(1.33)	0.003(0.10)	
Turnover _{it-1}	-0.013(-0.28)	0.051(1.01)	
Abacc _{it-1}	0.196***(2.66)	0.049(0.98)	
Volatility _{it-1}	-0.095(-0.44)	-0.389*(-1.82)	
CEO_Fem _{it-1}	0.122*(1.76)	0.014(0.18)	
CEO_age _{it-1}	-0.200(-1.46)	0.037(0.30)	
CEO_edu _{it-1}	0.013(0.17)	-0.088(-1.61)	
CEO_pay _{it-1}	0.011**(2.48)	0.006(1.29)	
CEO_ratio _{it-1}	0.165(1.16)	-0.219(-1.21)	
CEO_dual _{it-1}	0.002(0.05)	0.010(0.22)	
constant	-4.349***(-3.25)	-0.762(-0.88)	
year	yes	yes	
firm	yes	yes	
N	1003	1285	
F	3.717	3.809	
Adj_R ²	0.144	0.083	
Empirical p-value	0.086*		

degree or above in the total population over 6 years old in each province..¹¹

The underlying logic of the instrumental variables is as follows. Firstly, from the perspective of exogeneity, the shareholding structure of listed companies is one of the factors that attract analysts (Boubaker and Labégorre, 2008). However, since the major shareholders are more involved in the management of companies through voting at shareholders' meetings, appointing directors and personnel, etc., they do not have direct conflicts of interest with analysts. In addition, higher education rate reflects the educational level in the region where the firm is located, which is an attribute of the external environment of the firm. The exogeneity of higher education rates primarily lies in their long-term impact on social trust. According to Huang et al. (2011), higher education enhances social trust through cultural and structural changes, rather than directly influencing short-term economic performance or specific variables in financial markets. Although higher education rates may indirectly affect some economic factors by improving economic status or income (Huang and Deng, 2012), these effects are largely related to individuals' long-term social outcomes, rather than having an immediate impact on analysts' forecasts. Furthermore, Putnam (1994) suggests that the increase in social trust driven by higher education is rooted in long-term cultural accumulation, with no direct link to short-term market information. Therefore, the use of higher education rates as an instrumental variable effectively mitigates potential endogeneity with analysts' optimism bias in earnings forecasts.

Secondly, from the perspective of relevance, a concentrated shareholding structure can make the controlling shareholder more motivated to monitor management, which can effectively alleviate the agency problem between shareholders and management (Grossman and Hart, 1980; Shleifer and Vishny, 1997). The higher controlling shareholder ratio will effectively enhance the CEO hometown connection to reduce information asymmetry, and thus reduce analysts' optimism bias in earnings forecasts. Moreover, higher education level makes it easier for residents to learn and understand the knowledge of equity investment, so as to promote their participation in the financial market more actively (Vissing-Jorgensen, 2002), and the well-educated consumers in the market are the best self-defense against the constantly changing external investment environment. Therefore, higher education is related to regulation and plays a complementary role in reducing CEOs' pursuit of self-interest, which will lead to more social monitoring and trust, thereby weakening the informal institutional role of CEO hometown connections.

 $^{^{7}}$ Agency costs: Agency costs=administration expense/operation revenue. Equals 1 if the agency costs is higher than the year-industry median agency costs index.

¹¹ The data is from China Statistical Yearbook.

Table 10 Alternative measures of independent variables.

Variables	Optimism					
	(1)	(2)	(3)			
Home _{it-1}	-0.038**(-2.01)	-0.040**(-2.20)	-0.038**(-2.06)			
Growth _{it-1}		-0.010(-1.07)	-0.010(-1.07)			
ROA _{it-1}		0.161(1.25)	0.163(1.29)			
Lev _{it-1}		-0.440***(-4.78)	-0.442***(-4.87)			
BM_{it-1}		-0.042(-0.56)	-0.038(-0.50)			
Size _{it-1}		0.145***(4.05)	0.145***(4.02)			
Follow _{it-1}		0.043***(2.62)	0.042**(2.58)			
INST _{it-1}		-0.352**(-2.56)	-0.351**(-2.50)			
Listage _{it-1}		0.101(1.23)	0.110(1.34)			
Horizon _{it-1}		0.039(1.55)	0.039(1.58)			
Turnover _{it-1}		-0.005(-0.17)	-0.007(-0.22)			
Abacc _{it-1}		0.055(1.58)	0.056(1.56)			
Volatility _{it-1}		-0.235(-1.50)	-0.214(-1.37)			
CEO_Fem _{it-1}			0.011(0.22)			
CEO_age _{it-1}			-0.069(-0.78)			
CEO_edu _{it-1}			-0.078**(-1.99)			
CEO_pay _{it-1}			0.010***(2.61)			
CEO_ratio _{it-1}			-0.050(-0.43)			
CEO_dual _{it-1}			-0.015(-0.49)			
constant	0.688***(9.58)	-2.554***(-3.87)	-2.368***(-3.32)			
year	yes	yes	yes			
firm	yes	yes	yes			
N	2288	2288	2288			
F	4.851	5.969	5.287			
Adj_R ²	0.0299	0.0913	0.0965			

Table 11 Heckman selection model.

Variables	Analys t_{it} (1) Selection (the first-stage)	Optimis m_{it} (2) The second-stage
Homesup _{it-1}	-0.474***(3.30)	-0.096***(-2.89)
Growth _{it-1}	0.009(0.36)	-0.011*(-1.84)
ROA _{it-1}	1.599***(4.07)	-0.258**(-2.45)
Lev _{it-1}	-0.978***(-5.84)	-0.068*(-1.71)
BM_{it-1}	-1.269***(-6.78)	0.028(0.71)
Size _{it-1}	0.784***(16.58)	-0.039***(-2.91)
Follow _{it-1}	_	0.008(1.07)
INST _{it-1}	2.799***(7.49)	-0.285***(-4.64)
Listage _{it-1}	-0.645***(-11.38)	0.006(0.37)
Horizon _{it-1}	_	0.054***(3.74)
Turnover _{it-1}	-0.156*(-1.69)	0.066***(3.23)
Abacc _{it-1}	0.104(0.56)	0.054(1.53)
Volatility _{it-1}	0.302(0.55)	-0.202*(-1.85)
CEO_Fem _{it-1}	0.225*(1.72)	-0.043*(-1.71)
CEO_age _{it-1}	-0.243(-1.24)	-0.068(-1.50)
CEO_edu _{it-1}	-0.078(-0.82)	0.013(0.66)
CEO_pay _{it-1}	-0.001(-0.04)	0.004*(1.66)
CEO_ratio _{it-1}	0.592*(1.66)	0.030(0.46)
CEO_dual _{it-1}	-0.051(-0.68)	0.009(0.59)
Intangible _{it-1}	0.859*(1.92)	
Lambda		-0.113***(-2.74)
Constant	-13.497***(-11.50)	1.592***(5.01)
year	yes	yes
Ind	yes	yes
N	3260	2288

Note: ***, **, * denote significance at 1%, 5% and 10% respectively, t-values are in brackets.

Table 13 reports the IV regression results using the two-stage ordinary least squared approach. The first-stage regression results are reported in column (1), showing that the estimated coefficients of the two IVs are significant. The controlling shareholder ratio will enhance the CEO home connection while the higher education rate is found to have a negative impact on CEO hometown connection. The two IVs are all related with the hometown connection. The second-stage regression results reported in columns (2), pass the

Table 12 Further controlling for other factors.

Variables	Optimism	
	(1)	(2)
Homesup _{it-1}	-0.168***(-2.59)	-0.182***(-2.90)
Growth _{it-1}	-0.011(-1.21)	-0.011(-1.19)
ROA _{it-1}	0.177(1.37)	0.179(1.40)
Lev _{it-1}	-0.437***(-4.84)	-0.442***(-4.81)
BM_{it-1}	-0.060(-0.81)	-0.047(-0.61)
Size _{it-1}	0.152***(4.20)	0.154***(4.09)
Follow _{it-1}	0.039**(2.39)	0.042**(2.54)
INST _{it-1}	-0.376***(-2.72)	-0.004***(-2.83)
Listage _{it-1}	0.106(1.28)	0.096(1.14)
Horizon _{it-1}	0.035(1.43)	0.039(1.56)
Turnover _{it-1}	-0.011(-0.36)	-0.010(-0.31)
Abacc _{it-1}	0.058(1.61)	0.057(1.59)
Volatility _{it-1}	-0.232(-1.53)	-0.251*(-1.65)
CEO_Fem _{it-1}	0.024(0.45)	0.021(0.39)
CEO_age _{it-1}	-0.041(-0.47)	-0.028(-0.31)
CEO_edu _{it-1}	-0.077*(-1.90)	-0.074*(-1.77)
CEO_pay _{it-1}	0.000 (0.02)	-0.000(-0.09)
CEO_ratio _{it-1}	-0.072(-0.62)	-0.070(-0.58)
CEO_dual _{it-1}	-0.011(-0.36)	-0.015(-0.46)
SCC _{it-1}	0.121(1.39)	0.157*(1.80)
SCT _{it-1}	0.058(0.89)	0.029(0.41)
SCS _{it-1}	-0.027(-0.90)	-0.035(-1.15)
CG_{it-1}		0.0195(0.63)
CC _{it-1}		1.342(0.86)
constant	-2.476***(-3.45)	-2.598***(-3.50)
year	yes	yes
firm	yes	yes
N	2288	2288
F	4.897	5.290
Adj_R ²	0.0944	0.1020

Table 12IV regression results.

Variables	Homesup _{it-1}	Optimism _{it}
	(1) The first-stage	(2) The second-stage
Homesup _{it-1}		-0.736***(-3.03)
Shareholder _{it-1}	0.162***(6.29)	
Edu _{it-1}	-0.098***(3.10)	
Growth _{it-1}	-0.006**(-2.01)	-0.014(-1.63)
ROA_{it-1}	-0.107(-1.57)	-0.163*(-1.91)
Lev _{it-1}	-0.023(-0.90)	-0.123***(2.96)
BM_{it-1}	0.053**(2.26)	0.042(1.04)
$Size_{it-1}$	-0.020***(-3.54)	-0.019*(1.90)
$Follow_{it-1}$	0.005(1.02)	0.011(1.27)
INST _{it-1}	-0.095***(-3.64)	-0.313***(-4.69)
Listage _{it-1}	0.023***(2.83)	-0.002(-0.18)
Horizon _{it-1}	-0.016*(-1.65)	0.041**(2.28)
Turnover _{it-1}	0.001(0.12)	0.050**(2.21)
Abacc _{it-1}	-0.009(-0.54)	0.050(1.35)
Volatility _{it-1}	-0.055(-0.94)	-0.210(-1.36)
CEO_Fem _{it-1}	-0.0002(-0.01)	-0.036(-1.19)
CEO_age _{it-1}	0.009(0.34)	-0.073(-1.57)
CEO_edu _{it-1}	-0.042***(-3.28)	-0.013(-0.59)
CEO_pay _{it-1}	-0.002(-1.01)	0.003(0.96)
CEO_ratio _{it-1}	-0.163***(-5.03)	-0.033(-0.50)
CEO_dual _{it-1}	0.018*(1.86)	-0.002(-0.12)
constant	0.554***(3.47)	1.298***(4.32)
year	yes	yes
Ind	yes	yes
N	2288	2288
Under identification test (Kleibergen-Paaprk LM statistic)		47.745
		(p = 0.000)
Weak identification test(Kleibergen-Paaprk Wald F statistic)		F = 24.148(>10% maximal IV size(Stock-Yogo weak ID test critical values)=19.93)
Hansen J chi		$2.419 \ (p = 0.1199)$

Note: ***, **, * denote significance at 1%, 5% and 10% respectively, t-values are in brackets.

under-identification test, weak identification test and exogeneity test. After addressing the endogeneity problem, CEO hometown connection is still significantly and negatively correlated with analysts' optimism bias in earnings forecasts, suggesting that the basic regression results and robust and reliable.

7. Conclusions and policy implications

Using a sample of Chinese listed firms from 2009 to 2020, we investigate the relation between CEO hometown connection with suppliers and analysts' optimism bias in earnings forecasts. The empirical results indicate that CEOs' hometown connections with suppliers are negatively associated with analysts' optimism bias, and the finding remains robust in the subsequent robustness tests. Meanwhile, this "hometown effect" is more pronounced in firms characterized by lower-quality information disclosure, lower transparency, weaker monitoring, higher agency costs, and those located in provinces with lower marketization levels. In general, this paper supports the positive role of CEO hometown connection as an informal institution in developing countries and relatively underdeveloped regions, contributing to the existing literature by enriching and expanding research on the determinants of analyst optimism, while also offering novel insights into CEO selection criteria.

CEOs leveraging hometown connections with suppliers can secure informational advantages and foster mutual trust among business partners, thereby mitigating information asymmetry. Moreover, the external monitoring provided by suppliers and the credibility derived from hometown ties can help constrain CEO moral hazard, thus diminishing analysts' optimism bias in earnings forecasts. In regions where formal institutions are underdeveloped, hometown connections serve as a beneficial informal institution, offering practical guidance for investors exploring opportunities in emerging and less developed regions. This plays a pivotal role in easing the information asymmetry prevalent among market participants and in fostering the robust growth of capital markets. However, CEO hometown connections should not be viewed as a comprehensive solution to information asymmetry or agency issues. For investors, regions with sound legal systems and strict regulatory environments are far more appealing than regions with weak external environments. While hometown connections can act as substitutes for formal systems, it is essential for regulators and local governments to prioritize establishing sound legal frameworks to create a fair and transparent business environment, reduce information asymmetry, and curb self-interested behavior of CEOs. This would enable investors access more objective and accurate earnings forecasts from analysts. In addition, companies must be aware of potential negative consequences while capitalizing on the positive effects brought by CEO hometown connections.

Compliance with ethical standards

The authors have no financial or proprietary interests in any material discussed in this article.

Availability of data and materials

The datasets generated and analyzed during the current study are available in the China Stock Market and Accounting Research database [https://www.gtarsc.com/] and the National Enterprise Credit Query System[https://www.qcc.com/].

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CRediT authorship contribution statement

Fanjie Fu: Writing – original draft. Shujie Yao: Writing – review & editing. Jing Fang: Software, Investigation. Fan Zhang: Writing – review & editing, Funding acquisition. Chuan Lin: Resources, Supervision, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no competing interests.

Appendix A. Variable definitions

Appendix A

Appendix A

Variables definition.

Analyst optimism bias variable	Variables definition
Optimism _{it}	Analyst optimism bias: See Eq (1) for details
The key explanatory variables	
Homesup _{it-1}	Share purchased from CEOs' hometown firms among five suppliers
Home _{it-1}	Equals 1 if any suppliers registered in CEOs' hometown province, otherwise, equals 0
Control variables	
Growth _{it-1}	Sales growth=the annual growth rate of operating revenue
ROA _{it-1}	Return on total assets = net profit/total asset
Lev _{it-1}	Firm-specific financial leverage = total assets/total debts
BM_{it-1}	Book to market value ratio
Size _{it-1}	Firm-specific size = the natural logarithm of total assets
$Follow_{it-1}$	Analyst following=the natural logarithm of 1 plus the number of analysts following the firm through the year
$INST_{it-1}$	The total percentage of share owned by institutional shareholders
Listage _{it-1}	Listing years=the natural logarithm of 1 plus the total number of years listed
Horizon _{it-1}	The natural logarithm of 1 plus the average number of days between the date of the earnings announcement and forecast dates
Turnover _{it-1}	the average monthly share turnover
Abacc _{it-1}	The absolute value of discretionary accruals, see Appendix B.1 for details
Volatility _{it-1}	The stock price volatility=the standard deviation of monthly return in a given year
CEO characteristics	
CEO_Fem _{it-1}	Take the value of 1 if CEO is female
CEO_age _{it-1}	CEO age= The natural logarithm of 1 plus the age of CEO
CEO_edu _{it-1}	Take the value of 1 if the educational background of CEO is undergraduate or above
CEO_pay _{it-1}	CEO compensation=The natural logarithm of 1 plus the compensation of CEO
CEO_ratio _{it-1}	CEO shareholding ratio
CEO_dual _{it-1}	Take the value of 1 if duality of Chairman and CEO
Information characteristics	
Quality _{it-1}	Equals 1 if the KV index is lower than the year-industry median KV index, see Appendix B.3 for details.
Transparency _{it-1}	Following Hutton et al. (2009), the index representing the opacity of financial report in year t-1 is calculated as the three-year
	moving sum of the absolute value of annual discretionary accruals (see Appendix $B.1$ for details). The larger the value, the higher
	the opacity of the company.
	Equals 1 if the opacity of financial report is lower than the year-industry median opacity of financial report.
External environment characteristics	
Market _{it-1}	Equals 1 if the marketization index is greater than 0, see Appendix
	B.2 for details
Audit _{it-1}	Equals 1 if the firm is audited by Big-four or overseas auditors
Managers' moral hazard problems	
Agency _{it-1}	Agency costs = administration expense/operation revenue. Equals 1 if the agency costs is higher than the year-industry median agency costs index.

Appendix B.1. Measurement of firm-specific earning management (Abacc)

Following the modified model proposed by Dechow (1995), we first estimate the cross-sectional regressions for each industry sector and each fiscal year from 2008 to 2020. Taking the coefficient estimated from Eq. (5) into Eq. (6), the discretionary accruals ($DISACC_{it}$) firm iand year t are computed. The specific calculation method is as follows:

$$\frac{\mathrm{TA_{it}}}{\mathrm{ASSET_{it-1}}} = \alpha_0 \frac{1}{\mathrm{ASSET_{it-1}}} + \beta_1 \frac{\Delta \mathrm{SALES_{it}}}{\mathrm{ASSET_{it-1}}} + \beta_2 \frac{\mathrm{PPE_{it}}}{\mathrm{ASSET_{it-1}}} + \varepsilon_{it} \tag{5}$$

$$DISACC_{it} = \frac{TA_{it}}{ASSET_{it-1}} - \left(\widehat{\alpha}_0 \frac{1}{ASSET_{it-1}} + \widehat{\beta}_1 \frac{\Delta SALES_{it} - \Delta RECEIVABLES_{it}}{ASSET_{it-1}} + \widehat{\beta}_1 \frac{PPE_{it}}{ASSET_{it-1}}\right)$$
(6)

The variable Abaccit is the absolute value of discretionary accruals for firm iat year t.

$$Abacc_{it} = ABS(DISACC_{it})$$
(7)

Where, $Asset_{it-1}$ is the total assets of firm i at the beginning of year t. TA_{it} is total accruals for firm i during year t. $\Delta SALES_{it}$ is the change in sales for firm i in year t, and PPE_{it} (denotes property, plant, and equipment) is the original fixed assets value for firm i at the end of year t.

Appendix B.2. Marketization level of company location measures (Market)

The marketization index is from $\langle Marketization Index of China's Provinces: NERI^{12}$ Report 2021 \rangle prepared by Wang et al. (2021), and it constitutes an index system through 17 basic indexes in 5 aspects (the relationship between government and market, the development of non-state economy, the development of product market, the development of factor market, the development of market intermediary organization and legal environment). We regard it as a proxy index reflecting the marketization level in each province. And then, we standardize the marketization index, the mean value is 0. Market_{it-1} equals 1 if the marketization index is greater than 0, which means the market environment is better.

Appendix B.3. Quality of information disclosure measures (KV)

Kim and Verrecchia (2001) develop the KV index to reflect the market's reliance on trading information. This index can also objectively reflect the quality of information disclosure of listed companies. The higher the KV index, the greater the investor's reliance on trading information and the lower the investor's reliance on information disclosure quality of listed companies. In other words, the lower the KV index, the higher the quality of information disclosure of listed companies.

Referring to Kim and Verrecchia (2001), Zhai et al. (2014), we develop the modified model the construct KV index to measure information disclosure quality, and the specific calculation method is as follows:

$$\ln \left| \frac{(P_t - P_{t-1})}{P_t} \right| = \alpha + \beta (Vol_t / Vol_0 - 1) + \varepsilon_t$$
(8)

$$KV = \beta$$
 (9)

Where, P_t is the closing price of the stock on day t. Vol_t is the trading volume of the stock on day t, and Vol_0 is the annual average daily trading volume. We estimate Eq. (8) for each firm in each year and define the coefficient β from Eq. (8) as KV index. The higher the value of KV index, the more inadequate the information disclosure of the company, that is, the KV index is inversely proportional to the information disclosure quality.

Appendix B.4. Corporate governance level (CG)

Referring to Yan et al. (2018), A composite index constructed using principal component analysis (PCA) with 10 corporate governance variables.

The 10 indicators include: the proportion of shares held by the largest shareholder (Top1), the equity balance degree (Ebd, the ratio of the shareholding percentages of the second to tenth largest shareholders to that of the largest shareholder), the proportion of executive shareholding (Man), the proportion of independent directors (Ind_dir, the ratio of the number of independent directors to the total number of directors), the board size (Board, the natural logarithm of the number of board members), the number of board meetings (BF, the natural logarithm of the number of board meetings), firm's property state (SOE, 1 for state-owned, 0 otherwise), whether the chairman and CEO positions are combined (Dual, 1 if combined and 0 otherwise), whether B shares or H shares are issued (HB_share, 1 if issued and 0 otherwise), and whether there is a parent company (Parent, 1 if present and 0 otherwise). We adopt principal component analysis to find linear combinations of the aforementioned 10 governance variables and select the first principal component as the indicator for measuring corporate governance level.

Appendix B.5. Corporate competitiveness (CC)

Market share, as a crucial indicator of corporate competitiveness and market position, directly reflects the extent of a firm's presence in a specific market(Edeling and Himme, 2018; Bhattacharya et al., 2022). Therefore, Corporate competitiveness is defined as the ratio of a company's operating revenue to the total operating revenue of all firms within the same industry for a given year.

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¹² NERI means National Economic Research Institute.

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