A Study of Chief Executive Officer (CEO) Turnover in China

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ABSTRACT

CEO turnover has been extensively studied in developed countries. However, in developing countries with weak legal and regulatory frameworks, underdeveloped financial systems, and poor corporate governance, the factors that influence forced CEO turnover require further investigation. Therefore, this thesis examines the influencing factors of CEO turnover in China from various perspectives. This dissertation consists of three essays.

The first essay investigates whether tax rates affect forced CEO turnover. Our findings indicate a negative relationship between tax rates and forced CEO turnover. Listed companies with low tax rates increase public concern, leading to inspections by tax authorities, which can further damage the company's reputation. Changing the CEO is a quick and easy way to respond to public accusations. Additionally, we find that state-owned enterprises (SOEs) undertake more social responsibilities than non-state-owned enterprises (non-SOEs). CEOs are appointed by the State-Owned Assets Supervision and Administration Commission (SASAC), and they require SOEs take more social responsibility than non-SOEs. Therefore, the social pressure caused by tax avoidance is more significant in SOEs.

The second essay analyzes the relationship between risks and CEO turnover. Our study reveals that crash risk is positively associated with forced CEO turnover. Furthermore, we find that idiosyncratic risk increases the likelihood of forced CEO turnover, and the positive relationship between risk and forced CEO turnover is more significant in non-SOEs than in SOEs. Systematic risk, on the other hand, does not affect forced CEO turnover. Risks can serve as a significant indicator of a CEO's ability and competence.

The third essay examines whether comment letters have a "shelter effect" or a "supervision effect" on the CEO. Our study indicates a significant positive relationship between comment letters and forced CEO turnover, which supports the notion that comment letters play a "supervisory role" in CEO turnover. Moreover, we find that high marketization regions amplify the "supervision effect" of comment letters on forced CEO turnover. This paper contributes to the literature on the supervision of comment letters, which enhances external corporate governance. It also verifies the efficiency of the principle of public law enforcement and demonstrate it in the emerging market.

Key words: *CEO turnover, agency theory, tax outcomes, risk management, comment letters*

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Chapter 1: The impact of Corporate Tax Outcomes on Forced CEO Turnover

Abstract

As market competition has intensified in recent years, CEO turnover has become more frequent. Tax avoidance is often employed to maximize after-tax profits. Therefore, this paper aims to analyze the impact of corporate tax avoidance on forced CEO turnover. This study selects the Chinese A-share market from 2010 to 2018 as a sample, combining theoretical analysis and empirical research to explore the impact of corporate tax avoidance on CEO turnover. Furthermore, the relationship is analyzed under different ownerships. We find a negative relationship between tax rates and forced CEO turnover. Listed companies with low tax rates increase public concern, leading to inspections by tax authorities. After a CEO turnover, the company's strategy needs to be repositioned. Replacing the CEO is a quick and easy way to respond to public accusations. Moreover, we also find that CEOs in SOEs are appointed by the state-owned assets supervision and administration commission (SASAC) and therefore, state-owned enterprises (SOEs) undertake more social responsibilities than non-state-owned enterprises (non-SOEs). Consequently, the social pressure caused by corporate tax avoidance is more significant in SOEs. The main contributions of this paper are twofold: from a theoretical perspective, it conducts systematic research on corporate tax avoidance and CEO turnover and analyzes the relationship under different ownerships. From a practical standpoint, this paper puts forth relevant policy recommendations for the long-term development of enterprises and social responsibilities.

Keywords: corporate tax avoidance, CEO turnover, corporate governance, ownership

1.Introduction

There is a lack of empirical evidence on whether the CEO bears the reputation cost due to tax avoidance activities, especially in emerging markets (Chyz and Gaertner, 2017). Because reputational cost is multidimensional and therefore difficult to observe and define (Graham et al., 2014), this paper investigates the relationship between tax avoidance and forced CEO turnover, which refers to the removal of a CEO from their position due to tax rates are too low. CEOs can affect tax planning through the "tone at the top" strategy, and they have overall responsibility for a firm's tax policy (Armstrong et al., 2012; Crocker and Slemrod, 2004). Moreover, Dyreng et al. (2010) find that CEOs have a more significant impact on tax avoidance than CFOs. Given this, the CEO is likely to become the "scapegoat" for improving the company's image and changing the company's tax strategy. Chyz and Gaertner (2017) find evidence that CEOs bear reputational penalties for avoiding paying taxes in America.

On the one hand, tax expense is a main way for enterprises to undertake social responsibility (Lanis et al., 2018). Tax avoidance is regarded as a socially irresponsible activity, which

weakens the companies' legitimacy and may be questioned and criticized by the public (Kerr et al., 2008; Lanis & Richardson, 2012; Lanis & Richardson, 2014; Sikka, 2019; Annuar et al., 2014; Christensen & Murphy, 2004). Thus, companies seeking to uphold their legitimacy are expected to engage in less tax avoidant activities (Lanis & Richardson, 2012; Lanis et al., 2018). Hanlon and Slemrod (2009) find that companies would be labeled as "poor corporate citizens" when tax rates are too low. Firms and managers are unwilling to engage in tax avoidance activities due to reputation concerns (Austin & Wilson, 2017; Cheng et al., 2012; Desai et al., 2006; Dyreng et al., 2016; Graham et al., 2014; Graham et al., 2012; Hanlon & Slemrod, 2009; Lenter et al., 2003; Scholes et al., 2005). Crocker and Slemrod (2004) support the existence of reputation costs. In addition, companies that pay more taxes deliver excellent performance information to the market. Furthermore, the costs are much higher than the benefits if companies engage in tax avoidance activities (Chen et al., 2010). Companies not only need to pay additional consulting fees and audit fees for tax planning, but they may also be punished by regulatory authorities (Badertscher et al., 2013; DeAngelo, 1981; Donohoe & Knechel, 2014; Desai & Dharmapala, 2009; Graham et al., 2012).

On the other hand, tax avoidance reduces cash outflows and retains more cash in the company (Blouin, 2014). Hanlon and Heitzman (2010) conclude that CEOs have a responsibility to manage corporate transactions in a tax-efficient manner. Otherwise, the board will doubt the CEO's ability to manage company resources when the effective tax rate is high. Furthermore, as rational individuals, CEOs may have a self-interest motivation if the company lacks effective supervision. They may use tax avoidance transactions to pursue their own private interests (Cheng & Warfield, 2005; Desai et al., 2006). Laguir et al. (2015) find that CEOs with more power are more likely to implement radical tax avoidance strategies. Therefore, CEOs have both the ability and the willingness to undertake tax avoidance strategies. Besides, compared with corporate misconduct, tax avoidance activities may have little impact on the company's reputation (Gallemore et al., 2014). Therefore, CEOs may be more willing to reduce tax rates. Failure to participate in tax avoidance may result in the CEO being unable to achieve the after-tax profit target and increase the possibility of dismissal.

It is necessary to distinguish between SOEs and non-SOEs in the Chinese context. There are substantial differences between state-owned enterprises and non-state-owned enterprises, which also result in different effects of tax avoidance on forced CEO turnover. State-owned enterprises bear a heavier tax burden to maintain the stability of national tax revenue and achieve social goals. Bradshaw et al. (2019) find that tax avoidance behavior is less common in state-owned enterprises in China, and Chen et al. (2021) find that the effective tax rate and cash tax payment of state-owned enterprises are higher than those of non-state-owned enterprises. Furthermore, the government controls the assessment, appointment, and removal of CEOs in SOEs. Zhang et al. (2016) show that the probability of a manager being promoted to a higher-level position is positively associated with tax rates in SOEs. CEOs in SOEs have an incentive to pay more in taxes to ensure their position. In contrast, non-state-owned enterprises are primarily concerned with increasing the value of the company. Tax avoidance strategies can reduce tax costs, retain more cash flow in the enterprise, and increase shareholders' value. Therefore, CEOs in non-state-owned companies pay less in taxes and are

less likely to be fired than their counterparts in state-owned enterprises.

This study uses the Linear Probability Model (LPM) to verify the influence of tax avoidance on the replacement of CEOs from 2010 to 2018. The results show a significant positive relationship between tax avoidance and forced CEO turnover, supporting the reputational effects on CEOs. The study also found that the relationship is more significant in SOEs than in non-SOEs. In conclusion, this paper supports the association between tax avoidance and the CEO's reputation and conducts a series of robustness tests to verify the results.

This research analyzes corporate tax avoidance on forced CEO turnover from a more comprehensive perspective and enriches the existing literature. Firstly, this paper adds to the existing literature on tax avoidance. Since Hanlon and Heitzman (2010) publish their work, numerous researchers have investigated the reasons and impacts of tax avoidance. Few have analyzed tax avoidance from the perspective of corporate social responsibility. Because shareholders and society have different requirements for corporate tax planning, and the impact on forced CEO turnover is also different. Secondly, our study contributes to the literature on the reputation cost associated with tax avoidance. There is scant empirical evidence that CEOs suffer reputational damage because of tax avoidance activities (Hanlon & Slemrod, 2009; Rego & Wilson, 2012). This paper finds that tax avoidance, like many other forms of corporate misconduct, does have significant reputational consequences. Furthermore, Chyz and Gaertner (2017) do not analyze the relationship in developing countries. China, as an emerging capital market substantially different from America, may bring completely different results. In the Chinese context, it is necessary to distinguish between state-owned enterprises (SOEs) and non-SOEs, as different ownership structures have resulted in different effects on CEO turnover. This paper fills this research gap.

This study is divided into five parts. The introduction is in section one. The next section presents a theoretical review, literature review and hypothesis development. The third section shows the sample and model, followed by empirical results and robustness tests. The last section is the conclusions.

2.Research Theory

This paper is based on two theories: agency theory and stakeholder theory. Agency theory emphasizes the relationship between shareholders and managers and cannot fully explain the relationship between tax avoidance and corporate governance (Tsai et al., 2016; Gallemore et al., 2014;Gaertner, 2014; Christensen et al., 2015; Zolotoy et al., 2020; Wang et al., 2020).. Stakeholder theory analyzes the relationship between the company and stakeholders such as government agencies, political groups, customers, and the public (Chiu & Sharfman, 2016; Saka et al., 2017; Zolotoy et al., 2020).

Stakeholder theory emphasizes the importance of customers, suppliers, employees, investors, communities, and other organizations (Freeman, 1984). It emphasizes the importance of corporate social responsibility (Donaldson & Preston, 1995; Mitchell et al., 1997). According

to stakeholder theory, companies should create value for all stakeholders, not just shareholders. Because companies seek legitimacy from various stakeholders within the community. Legitimacy is achieved through company responsibility, which is determined by stakeholders.

Agency theory was proposed by Michael C. Jensen in 1976. Due to the separation of ownership and control, conflicting interests may arise between shareholders and managers. Shareholders aim to maximize after-tax profits, while managers prioritize their personal interests (Desai & Dharmapala, 2009b). To address this issue, companies often use equity incentive compensation to mitigate agency problems (Jensen & Meckling, 1976). When managers are compensated after taxes, they are motivated to reduce tax expenses. For instance, Gaertner (2014) find that after-tax compensation for managers decreases the effective tax rate for the company. Additionally, some CEOs may struggle with paying too much tax instead of too little. As a result, they may be unwilling or unable to seek tax avoidance opportunities or cannot manage company resources effectively. Therefore, implementing a tax plan can benefit shareholders by increasing cash inflows if the company has robust corporate governance (Blouin, 2014).

The lack of theory on SOEs is due to two factors. First, the development of a theory is influenced by its environment. Most of the corporate theories were developed in the United States. They emphasize the characteristics of American companies. The basic assumption of most theories is to maximize corporate profits, which does not apply to SOEs. Second, the ideological debate between socialism and capitalism makes it difficult for SOEs to produce theories, and the potential advantages of state-owned enterprises are difficult to publicize. Most western scholars believe that the efficiency of state-owned enterprises is lower than that of non-SOEs. Therefore, state-owned enterprises should not be studied separately but should be privatized. However, state-owned enterprises have continued to expand their global influence since 2008 (Fee et al., 2013). Many countries are moving in the direction of state-owned enterprises. According to Chakrabarty (2014), SOEs contribute 62% of the stock market value in Russia.

To better understand Chinese companies, this paper must pay attention to the background of Chinese companies (Bai & Bennington, 2007; Chen et al., 2008; Kierans et al., 2021; Lin, 2021; Qian & Weingast, 1996; Spicer et al., 2000; Wong, 2009; Yu, 2019; Zhao & Zhang, 2016). State-owned enterprises account for approximately 80% of the Chinese stock market. The evolution of Chinese state-owned enterprise reform can be traced from the initial "Decentralizing Power and Giving Up Profits" (1978-1986) to "Separating Ownership and Control" (1987-1992), and then to "Establishing a Modern Enterprise System" (1993–present) (Spicer et al., 2000; Wong, 2009; Yu, 2019; Zhao & Zhang, 2016). The incentive and restraint mechanism for CEOs of state-owned enterprises is constantly updated. China has carried out non-privatization reforms, such as deregulation of prices, market liberalization, and increased use of incentives since the 1980s. Instead of privatization, like the former Soviet Union, the Chinese experience shows that non-privatization reform can improve the efficiency of state-owned enterprises. In China, establishing SOEs is a vital measure to regulate specific industries. As the actual controller of SOEs, the government plays a leading role in making policies and strategies (Bai & Bennington, 2007). The selection and appointment of executives are mainly

based on the "internal labor market" formed by government officials, which leads to different taxation attitudes between SOEs and non-SOEs. Most scholars believe that the degree of tax avoidance in SOEs is less than that of non-SOEs. From the perspective of business objectives, SOEs not only seek profits but also pursue social governance objectives such as growing regional economies, increasing revenue, and maintaining social stability. SOEs undertake more social responsibilities than non-SOEs. Most SOEs are built-in industries where private capital is reluctant to enter because of significant investments and long payback periods. Non-SOEs pay more attention to market value and profit than SOEs. Non-SOEs choose to increase their economic benefits by reducing tax expenditures (Chen et al., 2008; Kierans et al., 2021).

3.Literature Review

3.1 Corporate tax avoidance

The issue of tax avoidance has garnered the attention of numerous researchers in recent years. Graham et al. (2012) conduct a literature review of the top three accounting journals, namely the Accounting Review, Journal of Accounting and Economics, and Journal of Accounting Research, and discover an upward trend in the literature on tax avoidance. Several studies have analyzed the motivations and consequences of tax avoidance (Desai. & Dharmapala., 2007). In this paper, tax avoidance is broadly defined as any action that reduces a company's tax payment (Dyreng et al., 2008). The present study does not assess tax aggressiveness, tax risk, tax evasion, or tax shelters. Previous research has demonstrated substantial variation in effective tax rates. Thomsen and Watrin (2018) find that over half of companies had effective tax rates that reach or exceed 30% from 2005 to 2016, while more than 25% of companies maintain their effective tax rate below 20% in America (Hanlon et al., 2008).

Numerous factors affect companies' tax strategies, such as board composition, company structure, and management compensation. Edwards et al. (2015) discover that an increase in financial constraints leads to an increase in tax planning. Chyz (2013) suggest that the presence of suspicious executives is positively associate with corporate tax sheltering. Chen et al. (2010) find that, compared with other family companies, family companies without long-term institutional investors are more tax aggressive. Ayers et al. (2018) discover that analysts' cash flow coverage is positively correlate with tax avoidance. Cai and Liu (2009) demonstrate that, under the same circumstances, firms that are relatively disadvantage in competition show a stronger incentive to avoid taxes. Rego and Wilson (2012) regard equity risk incentives also increase corporate tax aggressiveness. Lanis et al. (2018) find that non-tax costs significantly impact corporate tax avoidance. Kim et al. (2011) discover that managers can manipulate income and conceal negative information through complex tax techniques. As stated by Slemrod (2004), if the marginal benefits of tax avoidance exceed the marginal costs, managers will take all measures to reduce tax costs. Companies that use after-tax incentive compensation have lower effective tax rates than those that use pre-tax compensation (Gaertner, 2014; Powers et al., 2016).

In conclusion, tax avoidance activities have a significant impact on investor attitudes, management reputation, and leverage. According to Goh et al. (2016), companies that engage in tax-avoiding strategies experience a decrease in the cost of equity. Moreover, Desai and Dharmapala (2009a) demonstrate that tax avoidance has a significant impact on corporate value. Similarly, Chen and Chu (2005) find that tax avoidance increases the degree of information asymmetry, leading to an increase in agency costs. The higher the information transparency, the fewer agency problems and the lower the degree of tax avoidance.

3.2 CEO turnover

CEO turnover has always been considered an influential factor in the change of enterprise strategy because the CEO is the decision-maker and implementer of enterprise strategy. CEO turnover has become a core issue in strategy, organization, finance, and leadership in recent years.

According to previous literature, the main factors that affect CEO turnover are company performance (Firth et al., 2006a, 2006; Gao et al., 2017; Jenter & Kanaan, 2015; Peng et al., 2015), industry competitiveness (Eisfeldt & Kuhnen, 2013; Jenter & Lewellen, 2021), board composition (Adams et al., 2010; Chemmanur & Fedaseyeu, 2018; Hillman et al., 2016), and ownership (Annuar et al., 2014; Chen et al., 2013; Zeitoun & Pamini, 2017). CEO turnover is an important part of corporate governance.

Boards have the responsibility to replace CEOs who fail to meet shareholder requirements. Weisbach (1988) discovers that when the board is mainly composed of external directors, CEOs are more likely to be replaced because of poor performance. Chang and Wong (2009) find that shareholders are more motivated to constrain the CEO based on financial performance when the company is incurring financial losses rather than profits. Ertugrul and Krishnan (2011) finds that the main reason for dismissing CEOs is corporate scandals in which CEOs engage in unethical or illegal activities rather than the decline of short-term performance. According to Jenter and Kanaan (2015), CEOs are sacked for poor performance, which is caused by factors beyond their control, such as a poor industry. Investment analysts, as third-party evaluators, can prove the CEO's ability, and negative analysis increases the probability of CEO turnover (Wiersema & Zhang, 2011). Arthaud-Day et al. (2006) find that financial restatement increases the risk of CEO turnover. However, the principal-agent theory cannot explain the reasons for CEO turnover in all enterprises. Cumming et al. (2011) propose that compared with SOEs, corporate fraud in non-SOEs is more likely to lead to CEO turnover in China.

Fee et al. (2013) show that effectively distinguishing between forced and non-forced CEO turnover reduces bias in the test, which can robustly analyze the relationship between tax and CEO turnover. Because forcing the CEO to leave is a deliberate action taken by the board.

In developed countries, CEO turnover has been widely studied. However, the determinants of CEO turnover remain unclear in countries with weak legal systems and underdeveloped

financial systems. Therefore, the study of the influencing factors of CEO turnover can improve corporate governance. Furthermore, it is rare to analyze the effect of the tax rate on CEO turnover in China. Our research also complements the existing literature on CEO turnover.

3.3 Relevant research on the relationship between corporate tax avoidance and CEO turnover

Although the CEO may not possess expertise in tax-related matters and hence cannot directly influence the company's tax policies, they hold the ultimate decision-making authority, a position that surpasses that of the tax director and CFO (Cazier et al., 2014). Research suggests that CEOs have a greater impact on effective tax rates than CFOs (Desai & Dharmapala, 2006; Feldstein, 1999). By using the "tone at the top" strategy, the CEO can indirectly influence tax policies (Hambrick & Mason, 1984). Furthermore, several studies have demonstrated that CEOs' characteristics can impact the decision-making process (Chyz, 2013; Dyreng et al., 2010; Olsen & Stekelberg, 2015; Rego & Wilson, 2012).

The CEO has the authority to adjust the company's annual budget to develop a tax strategy and can hire or dismiss a tax director for tax planning. Additionally, the CEO can direct the CFO or tax directors to modify the compensation plan to reduce tax expenses. Thus, the CEO possesses the intention and capability to influence the company's tax strategy. For example, Chyz et al. (2019) demonstrate a positive correlation between tax avoidance and CEO overconfidence. Koester et al. (2017) show that executives with greater resources can more effectively evade taxes. Furthermore, Chyz and Gaertner (2017) analyze CEO turnover in the United States from 1993 to 2006 and find a relationship between tax rates and forced CEO turnover. When the tax rate deviates from the industry average, the CEO is more likely to be replaced.

In conclusion, despite not being a tax expert, the CEO's elevated position and decision-making power, along with their capacity to indirectly influence tax policies, make them a key player in determining the company's tax strategy.

4.Research Gap

This article provides a comprehensive overview of the literature on CEO turnover and corporate tax avoidance in China. This article summarizes the literature and finds that some gaps can be filled:

(1) Although CEO turnover is a widely researched topic, the literature predominantly focuses on the impact of CEOs' abilities, personal characteristics, and company performance, overlooking the role of tax issues. Therefore, it is imperative to investigate the impact of tax-related matters on CEO turnover.

(2) Research on corporate tax avoidance has largely explored its causes and effects. However,

few studies have examined the relationship between CEO turnover and tax avoidance under different theoretical frameworks in China. As different motivations lead to different levels of tax avoidance, it is crucial to explore the varying attitudes towards CEOs by shareholders and society.

(3) To understand Chinese corporate governance, it is crucial to differentiate between state-owned enterprises (SOEs) and non-SOEs. Corporate tax avoidance varies significantly due to differences in ownership structures. While SOEs bear the primary responsibility of fulfilling social obligations, non-SOEs often seek to reduce their tax costs. The ownership differences have varying effects on CEO turnover, which have not been explored in previous research. This study aims to fill this gap in the literature.

5. Research Hypothesis

Tax expenses are a primary way for companies to make social contributions, providing funds for public utilities, welfare services, operating expenses, and debt servicing (Lanis et al., 2018). Taxes are the lifeblood of fiscal sustainability in all countries. In the long run, tax avoidance behavior ultimately burdens society unfairly and unjustly (Bracking, 2012).

For the survival of a company, legitimacy is necessary. To gain legitimacy from society and maintain good relations with tax authorities, companies should comply with tax regulations and demonstrate social responsibility. Corporate attitudes towards corporate social responsibility and considerations of legitimacy affect tax strategy (Gray & Balmer, 1998; Aguilera et al., 2007). The literature documents tax avoidance activities as socially irresponsible behavior (Avi-Yonah, 2006; Hasseldine & Morris, 2019). Therefore, companies rarely publicize their tax avoidance practices (Sikka, 2019). When a firm engages in tax avoidance, the public questions the legitimacy of the firm, believing that the firm is reluctant to contribute to society's well-being (Annuar et al., 2014). Public shame is an effective way to limit tax avoidance activities. Thus, companies seeking to uphold their legitimacy are expected to engage less in tax avoidance activities (Lanis et al., 2018).

According to the stakeholder theory, corporations have economic, legal, ethical, and philanthropic obligations. Corporate stakeholders generally encompass shareholders, employees, customers, suppliers, creditors, the government, and the community in which companies operate (Smith, 2003; Sikka, 2019; Fontrodona & Sison, 2006; Cuevas-Rodriguezz et al., 2012). Stakeholders view tax avoidance as contradictory to their expectations of proper firm behavior (Kerr et al., 2008; Lanis & Richardson, 2012; Lanis & Richardson, 2014). Because they believe that the company does not want to pay its "fair share" of tax to the government. Stakeholders' interests stem from the essential economic contributions they make (Hill & Jones, 1992). Stakeholder theory also believes CEOs are obligated to safeguard stakeholders' interests when executing their managerial duties (Freeman, 1984). Lanis and Richardson (2014) find that companies have a lower level of tax avoidance if they have positive relationships with stakeholders.

According to stakeholder theory, the costs of tax avoidance outweigh their benefits (Chen et al., 2010). It is commonly believed in the tax literature that reputational costs are a limiting factor regarding the degree to which firms and managers are willing to minimize their effective tax rates (Cheng et al., 2012; Graham et al., 2012; Hanlon & Slemrod, 2009).

Enterprises can obtain cash inflow through tax avoidance, which can be considered a source of financing. However, there are costs associated with tax avoidance. Tax avoidance will incur direct and indirect costs (Badertscher et al., 2013). In terms of direct costs, companies not only have to pay related consulting fees and additional audit fees for tax planning, but also face potential penalties. This may decrease cash flow and shareholders' wealth. From the perspective of indirect costs, tax avoidance is the result of complex transactions, which exacerbates the information asymmetry between insiders and outsiders. Since external investors cannot identify the actual situation of companies, they may demand a higher return. Tax avoidance also increases the complexity of the operating structure and financial system and facilitates management's opportunistic behaviors such as profit manipulation (Desai & Dharmapala, 2006; Frank et al., 2009). Furthermore, aggressive tax avoidance behaviors may be regarded as "bad citizenship" due to the unethical nature of tax avoidance (Scholes et al., 2005). Companies are subject to more stringent regulation from external sources, such as audit firms, the media, the government, consumers, etc. (Rego & Wilson, 2012).

Reputation is critical to tax planning decisions. Enterprises with a positive reputation can obtain higher benefits, such as improving brand image, getting customer support, and thus gaining more market share. The loss of enterprise reputation leads to a decline in customer brand loyalty (Gomes, 2000; Greif, 1989). Reputational costs caused by tax avoidance also lead to a decline in share prices (Graham et al., 2014; Hanlon & Slemrod, 2009). Chyz et al. (2019) confirm the existence of reputation costs. They find that companies are more likely to force CEOs to leave when they pay lower tax rates than their peers. Hanlon and Slemrod (2009) investigate whether news about corporate tax aggressiveness has a negative effect on stock prices. The results suggest that when a company is involved in tax shelters, its share price declines, especially for firms operating in the retail sector. The reason for this could be the consumer or taxpayer backlash. Crocker and Slemrod (2004) and Graham et al. (2012) support reputational costs for tax avoidance. Lenter et al. (2003) document a more negative market reaction to news about firms using tax shelters in the retail industry. They also find that the news of accusations that firms participated in tax shelter transactions negatively impacted stock prices. Graham et al. (2012) find that publicly traded companies, larger companies, and companies in the retail industry are significantly more concerned about the adverse reputation of tax planning. Austin and Wilson (2017) demonstrate that consumer-oriented firms report higher tax rates, suggesting that firms with more consumer orientation are more worried about reputation. Firms that face reputational damage tend not to participate in tax avoidance activities to minimize unwanted scrutiny.

From the perspective of managers, they are strongly motivated not to participate in tax avoidance. Reputation costs and punishment are the main reasons why managers are unwilling to reduce tax rates (Desai & Dharmapala, 2006; Hanlon & Slemrod, 2009). Scholes (2005)

finds that CEOs suffer reputation damage due to tax avoidance. Many studies have shown that reputational penalties follow "too much" tax avoidance activities. For example, Desai and Dharmapala (2006) suggest possible sanctions imposed upon managers who increase tax avoidance activities, including criminal, civil, or reputational sanctions. Austin and Wilson (2013) show that managers perceive reputation as an influential factor in making decisions, explaining why firms do not adopt potential tax planning strategies. Among executives, 69% are afraid of losing their reputations if they engage in tax avoidance strategies.

Auditing the annual report is the most critical external supervision activity. Recognition, measurement, and disclosure of tax expense and deferred tax are important contents of the audit. Corporate tax avoidance increases the litigation risk of auditors (Donohoe & Knechel., 2014). Large audit firms may incur reputational damage if the tax authority requests a restatement (DeAngelo, 1981). Increased tax avoidance may results in reduced government revenue and penalties from tax authorities. Li et al. (2019) analyze Chinese listed companies as a sample, and they find that when firms have a lower effective tax rate, the tax authority is more inclined to select the company for inspection. Therefore, inspection fees paid by enterprises also increase accordingly. After the company is inspected, the effective tax rate increases significantly. The US Securities and Exchange Commission (SEC) reviews the company's annual report regularly, issues comment letters on deficiencies, and carries out external monitoring of tax avoidance. Kubick et al. (2016) find that companies reduced tax avoidance after receiving the comment letter.

The media and consumers are paying increasing attention to companies that engage in tax avoidance activities. Hanlon and Slemrod (2009) find that consumers boycott companies that engage in tax avoidance. For example, Starbucks eventually paid more taxes "voluntarily" because the public strongly protested against the low tax rates reported by the media (Austin & Wilson, 2017). Companies that operate directly with the public, such as Starbucks, rely heavily on their reputation for success (Dyreng et al., 2016). Additionally, higher levels of corporate tax avoidance result in increased political costs and tax enforcement (Desai et al., 2007; Bankman, 2004; Zimmerman, 1983).

As mentioned above, paying taxes is an effective way for enterprises to fulfill their social responsibility. Stakeholders value companies that make substantial contributions to society, including paying taxes. Companies that pay high tax expenses provide valuable performance information to the market. Companies that have very low tax rates are subject to strict inspections by tax authorities, the media, and consumers, which can negatively impact the company's market value. Dyreng et al. (2017) find that companies that adopt tax avoidance strategies harm market value. Due to the impact of media, investors are immediately exposed to corporate tax avoidance behavior. Moreover, rating agencies view tax avoidance as a risk factor. If tax authorities publicly punish tax avoidance behavior, it damages a company's reputation and reduces investor confidence. The damage to reputation is greater than the financial penalty imposed by tax authorities. As the spokesperson for the corporation, the CEO is often held responsible and may be replaced in order to improve the company's image and demonstrate a commitment to changing its tax strategy.

Based on the above analysis, this paper proposes the first hypothesis.

H1A: The possibility of forced CEO turnover increases when the tax rates related to peer companies are low.

This paper also incorporates the agency theory between shareholders and executives into the framework of corporate tax avoidance, offering an alternative explanation for companies' tax planning (Hanlon & Heitzman, 2010). According to the principal-agent theory, shareholders and managers have conflicting interests. Shareholders aim for after-tax profits, while managers seek higher salaries (Desai & Dharmapala, 2006). Companies can mitigate the agency problem through equity incentives (Jensen & Meckling, 1976), which increase management's risk-taking and have a significant impact on tax avoidance. Many executives engage in tax avoidance activities to pursue higher compensation (Blaylock et al., 2012; Minnick & Noga, 2010). Powers et al. (2016) find that companies using cash flow indicators instead of income indicators to determine compensation show a higher degree of tax avoidance. Therefore, incentive compensation can reduce agency costs and increase tax avoidance (Jensen & Murphy, 1990)

As a component of operating costs, tax expenses reduce profits and affect the reinvestment and reproduction of the enterprise. By implementing a tax avoidance strategy, enterprises can decrease their tax costs, retain more cash, and become more competitive. According to Blouin (2014), CEOs have a responsibility to manage corporate transactions in a tax-efficient manner, and they may be asked if they have paid too much in taxes rather than too little. A reasonable tax plan benefits shareholders because it increases cash inflows and net income (Blouin, 2014). Therefore, shareholders rely on managers to find opportunities to reduce tax expenses (Hanlon & Heitzman, 2010). High effective tax rates indicate that managers are unwilling or unable to pursue such opportunities. Since tax expenses represent a transfer of wealth from shareholders to tax authorities, CEOs are responsible for reducing shareholder wealth. As effective tax rates increase, the board of directors and shareholders may doubt the CEO's ability to manage the company's resources. Thus, managers need to actively participate in tax avoidance, which reflects their profitability and management competence.

From the perspective of a CEO's interests, tax avoidance can occur in three situations. Firstly, CEOs may increase profits through tax avoidance to obtain higher compensation. If the CEO cannot reasonably avoid taxes, shareholders and capital markets may question the CEO's ability. Secondly, if the company lacks adequate supervision and corporate governance mechanisms, it will be unable to coordinate agency problems through equity compensation. As the core of the management team, CEOs have a decisive influence on tax avoidance activities. The CEO is motivated by self-interest when restrictions and supervision are ineffective. Tax avoidance transactions can be exploited to gain private interests (Desai & Dharmapala, 2006). Therefore, tax avoidance may serve the interests of management rather than shareholders. Cheng and Warfield (2005) conducted case studies on Enron, and found that managers use tax avoidance transactions to manipulate profits and obtain private interests. Slemrod (2004) finds that tax avoidance strategies directly reflect managers' motivation. Managers tend to retain more funds

in enterprises through tax avoidance strategies and use them for enterprise expansion or private interests. There is a complementary relationship between tax avoidance and the CEO's rent-seeking (Desai & Dharmapala, 2006; Hanlon & Heitzman, 2010). Executives without effective supervision will make radical tax avoidance decisions to seek private interests, and rent-seeking behavior will further enhance executives' willingness and ability to implement tax avoidance transactions. Thirdly, compensation can also affect the level of tax rates. The cash flow generated by tax avoidance is a supplement to executive compensation. Desai and Dharmapala (2006) find that the degree of tax avoidance is reduced if compensation increases. Managers tend to take aggressive tax avoidance measures when incentive contracts don't work. Laguir et al. (2015) confirm that CEOs with more power implement more radical tax avoidance strategies and seize more private interests accordingly. Gaertner (2014) finds a negative relationship between the after-tax compensation of CEOs and ETR. A plethora of literature finds a positive relationship between incentive compensation and tax avoidance activities (Armstrong et al., 2012; Halioui et al., 2016; Minnick & Noga, 2010; Seidman & Stomberg, 2017). For example, Armstrong et al. (2015) find that equity incentives increase tax avoidance strategies. Therefore, CEOs have the ability and willingness to manipulate profits by engaging in tax avoidance activities.

Not all companies are strongly affected by consumers, such as companies that engage in B2B transactions or companies with substantial market share. Kubick et al. (2014) find that companies with substantial market power are more active in tax avoidance. In addition, Huang et al. (2016) find that companies with a centralized customer base are more likely to engage in tax avoidance because they use tax avoidance to generate cash flow. Furthermore, the media, as a non-governmental organization, is expensive to monitor and has no material return. It is difficult for the public to keep their attention on tax avoidance for a long time. As a result, tax avoidance may have little impact on reputation.

Compared with corporate misconduct, tax avoidance activity may have little impact on the company's reputation. The reasons are as follows. In contrast to accounting fraud, tax avoidance is mostly legal or falls within the gray areas of tax law. Secondly, if the IRS agrees with the company's explanation of tax planning, tax avoidance can improve the company's after-tax cash flow. Finally, the risks involved in tax avoidance may differ from other risks faced by companies, such as liquidity, competition, and continued operation risks. Therefore, the impact of tax avoidance on corporate reputation may not be significant. According to Gallemore et al. (2014), there is no evidence that CEO turnover increases when companies participate in tax avoidance. This shows that CEOs do not incur a reputational cost because of the company's tax avoidance policies.

From the perspective of reducing agency costs and seeking personal interests, CEOs are more willing to avoid tax expenses. Failure to participate in tax avoidance may result in the CEO being unable to achieve the after-tax profit target and increase the possibility of dismissal. Therefore, we put forward the second hypothesis:

H1B: The possibility of forced CEO turnover increases when the tax rates related to peer companies are high.

The tax rate in China varies based on the ownership structure, and corporate income taxes play a crucial role in government operations as the primary source of state revenue (Chen et al., 2021; Rezki et al., 2020; Xiao & Xi, 2022; Bradshaw et al., 2019; Tang 2020; Chen et al., 2017; Hu & Xu, 2021; Huang et al., 2021; Lin, 2017; Lou et al., 2021; Radon & Thaler, 2005; Yu & Lee, 2016). The Chinese institutional environment, along with the divergence of enterprise positions and responsibilities, influences the differing attitudes towards tax avoidance between state-owned enterprises (SOEs) and non-SOEs (Rezki et al., 2020).

Previous research indicates that state-owned enterprises (SOEs) tend to pay higher tax rates compared to non-SOEs from three dimensions (Andreou et al., 2017; Bradshaw et al., 2019).

First and foremost, the government's primary objective is not to maximize the value of state-owned enterprises (SOEs), but rather to maximize social welfare. SOEs must undertake other social objectives for economic development and social stability (Hu & Xu, 2021; Huang et al., 2021) (Du et al., 2012; Tang et al., 2016) (Grossi et al., 2015; Uddin et al., 2005). To achieve social goals, state-owned enterprises must bear more tax expenses to maintain the stability of national tax revenue. Furthermore, ownership and control of SOEs belong to the government (Chen et al., 2021). The government requires state-owned enterprises to bear more tax expenses through administrative approaches, such as promoting economic growth. Chen et al. (2021) find that the effective tax rate and cash tax payment of state-owned enterprises are higher than those of non-state-owned enterprises. Bradshaw et al. (2019) find that tax avoidance behavior is less prevalent in state-owned enterprises in China.

In addition, state-owned enterprises (SOEs) attract more public attention, resulting in increased visibility and scrutiny of tax-related matters. This heightened scrutiny makes CEO dismissals more likely when tax issues arise (Hu, 2018), as they are seen as violations of the public interest and breaches of public trust and fiduciary responsibility.

The amount of tax paid significantly affects the public's evaluation of state-owned enterprises. In China, SOEs face greater public pressure than non-SOEs for not fulfilling their social responsibilities (Kao et al., 2018), and public pressure related to disclosure can impose significant political and reputational costs (Dyreng et al., 2016; Hanlon & Slemrod, 2009). Therefore, when SOEs are exposed as engaging in extreme tax-sheltering activities, it contradicts government objectives and tarnishes the public image of SOEs. It also sends a negative signal to investors, potentially resulting in decreased confidence and reduced investment. Consequently, the reputational impact of using tax shelters will be more severe for SOEs, and governments may opt for CEO dismissals to mitigate these negative consequences (Hanlon and Slemrod, 2009).

Simultaneously, the government controls the assessment, appointment, removal, and career prospects of CEOs of state-owned enterprises, who aim to achieve political promotion rather than maximize profits (Chen et al., 2017; Hu & Xu, 2021; Huang et al., 2021; Fan et al., 2007).

Since tax revenue helps the government achieve social objectives (Richardson et al., 2016; Wen et al., 2020), SOE executives receive positive publicity and have greater chances of promotions if the SOE they manage pays more taxes. This provides further incentives for CEOs to maintain a higher tax rate for future promotions within SOEs (Zhang et al., 2016; Richardson et al., 2016; Wen et al., 2020; Bradshaw et al., 2019; Chen et al., 2021; Cen et al., 2017; Xia et al., 2017). Chen et al. (2021) find a positive relationship between CEO political promotion and tax rates in SOEs, which we label as the bureaucratic incentive effect. Therefore, failing to meet higher tax rates shows the CEOs' inability and incompetence and makes them more likely to be replaced (Bradshaw et al., 2019). Due to the restrictiveness of the SOE executive labor market and the link between CEOs' promotions and the achievement of social goals, CEOs in SOEs are more likely to face reputational damage as a form of punishment (Wang et al., 2020).

In addition, the public pays more attention to state-owned enterprises. The amount of tax paid significantly affects the public's evaluation of state-owned enterprises. SOEs with a high degree of tax avoidance will be criticized and questioned more. State-owned enterprises have to respond to the public's concerns, and CEO turnover is a more convenient way to respond.

Unlike state-owned enterprises, the goal of non-state-owned enterprises is to maximize the company's value. They have higher tax avoidance incentives to reduce tax costs, retain more cash flow in the enterprise, and increase shareholders' value. Compared with SOEs, the actual tax rate of non-SOEs is relatively low, showing that private enterprises have stronger tax avoidance motivations. Furthermore, CEOs are agents elected by the board of directors. Tax avoidance attitudes are different due to differences in appointment and promotion mechanisms. Non-state-owned enterprises bear less social responsibility, and the public is less critical of tax avoidance. Therefore, compared with state-owned enterprises, CEOs pay lower taxes to shareholders and are less likely to be fired in non-state-owned companies.

While tax issues may not be the sole reason for CEO dismissals in SOEs, they can significantly influence the decision-making process. The combination of public accountability, public perception, and political promotion associated with SOEs creates a distinct context in which tax-related misconduct by CEOs can have severe consequences, ultimately leading to their dismissal. Building upon the analysis presented above, this paper puts forward the following hypothesis:

H2: Compared to non-SOEs, tax avoidance in SOEs has a more significant impact on forced CEO turnover.

6.Data and Sample

Our sample consists of companies listed on both the Shanghai Stock Exchange (SHSE) and the Shenzhen Stock Exchange (SZSE) from 2010 to 2018. The main reason for the sample period beginning in 2010 is that China implemented the revised enterprise income tax law in 2008. The revision of the updated income tax law has reduced the maximum enterprise income tax

rate from 33% to 25%. The implementation of this policy in 2008 is expected to significantly affect tax avoidance. In addition, the global financial crisis that started in 2008 partially impacted the Chinese economy, leading to fluctuations in national policy. In short, to avoid the effects of the reformed income tax law and the global financial crisis, this paper takes 2010 as the starting year of the research sample. The sample period ends in 2018, because 2018 data is the latest research data available in this paper.

Next, we screen the samples as follows: (1) remove samples with pre-tax profits less than or equal to zero (Bradshaw et al., 2019; Dyreng et al., 2010); (2) exclude firms with incomplete information on key variables; (3) delete listed companies in the financial industry because accounting standards in the financial industry are quite different from those in other industries, and relevant indicators are not comparable; (4) delete companies marked as ST or * ST due to irregularities and negative profits for two or three consecutive years. The research data come from the CSMAR database. Additionally, all variables are winsorized at the top and bottom 1% to mitigate the effects of outliers. We obtain a final sample of 10,695 firm-year observations.

There are 1,701 CEO turnover events during the sample period. In Table 1, there are 12 reasons for CEO turnover, which are provided by the CSMAR database. Change of job is taking up the highest percentage, which accounts for 28.81%. The second is contract expiration, which represents 27.81%, and the third is personal reasons (12.17%). Only 0.76% fall into the dismissal category. In this paper, we reclassify reasons related to job changes, resignations, personal reasons, and reasons that are not given (Firth et al., 2006). Other turnovers are considered normal turnover, except when the CEO is less than 60 years old, and the stated reason is retirement. This paper classifies such turnover as forced.

Huson et al. (2004) find it difficult to separate forced and voluntary turnover based on public information as there are few news reports. In this paper, we track the destinations of departing CEOs through resume information provided by CSMAR. For example, the reason for a job change can be divided into forced and voluntary turnover. If a departing CEO subsequently holds a position that is better than what he held before, we classify it as non-forced turnover.

Table 2 summarizes the reasons for forced and normal turnover and their corresponding frequencies. By re-examining 958 cases through a search for CEO resumes, we find that 432 cases are not forced. It can be seen that 241 cases remained as board chairman or vice-chairman, and 191 cases were promoted (186 CEOs were promoted as chairman or vice-chairman; 5 CEOs became government officials). We classify the remaining 526 cases as forced turnover. These include 78 CEOs who accepted new positions ranked lower than the CEO position and 448 cases without any traceable destination information. In conclusion, there were 1,154 normal turnover events, accounting for 67.84% of the total, and 547 cases of forced turnover (32.16%).

7.Measures

According to Hanlon and Heitzman (2010), there are many approaches to measure tax avoidance to ensure the robustness of research conclusions. This paper uses four measures from

the balance sheet dimension and cash flow statement dimension: effective tax rate (ETR), cash effective tax rate (CASH_ETR), the book-tax difference (BTD), and discretionary book-tax difference (DDBTD). They are the core variables in the study of tax avoidance and have been used in many studies (Li et al., 2019). Based on their analysis, a higher ETR or cash-ETR indicates a lower level of tax aggressiveness, while a higher BTD and DDBTD show a higher level of tax avoidance.

ETR

$$ETR_{it} = income\ tax\ expense/(pre-tax\ income)\ (1)$$

Income tax expense and income before tax can be found on the income statement. ETR (effective tax rate) is the simplest measure used by many scholars (Bertrand & Schoar, 2003; Lanis & Richardson, 2012;). A lower ETR reflects lower tax expenditure, which may indicate potential tax avoidance (Blaylock et al., 2012). Listed companies mainly focus on ETR because it can be easily calculated from the annual report. The indicator reflects permanent differences (such as bad debt provisions) but not temporary differences, such as the accelerated depreciation method of fixed asset depreciation. ETR only transfers the timing of tax expense, and the total amount remains unchanged, which will not affect ETR in the long term. However, due to the complexity of tax policies, listed companies usually have tax benefits and different nominal tax rates, which make this method incompatible.

CASH-ETR

$$CASH\_ETR_{it} = cash\ tax\ payment/(pre-tax\ income)\ (2)$$

Cash tax payments can be found on the cash flow statement (Hoi et al., 2013; Lanis & Richardson, 2012). Hanlon and Heitzman (2010) find that earnings management based on the accrual basis may affect pre-tax income, thus affecting ETR. This paper uses cash flow from operating activities as another denominator to alleviate this concern. This indicator reflects both permanent and temporary differences and is not affected by accrual accounting. It is able to avoid the influence of earnings management and prevent overestimation of ETR. Therefore, our second measure, Cash-ETR, reflects firms' actual cash tax payments for a given level of pre-tax income.

BTD

$$BTD = (pre-tax\ income-taxable\ income)/(total\ asset)\ (3)$$
$$Taxable\ income = (Income\ tax\ expense\ -deferred\ income\ tax\ expense)/$$
$$(Nominal\ income\ tax\ rate)\ (4)$$

Book-tax difference (BTD) refers to the difference between book accounting profit and taxable income declared to the tax authority. This concept was proposed by Plesko in 2003. The larger the BTD, the greater the difference between accounting profit and taxable income. In 2006, Desai and Dharmapala proposed that shareholders consider the importance of accounting profits while tax authorities pay more attention to taxable profits. The difference between the two can reflect the degree of tax avoidance.

DDBTD

The discretionary book-tax difference (DDBTD) is the residual from equation (7) and is

frequently used in the literature as a variant of BTD. It uses earnings management indicators as explanatory variables for regression analysis, and the residual is used to measure the degree of tax avoidance. According to Desai and Dharmapala (2006), the residual item of tax difference represents the accounting tax difference after deducting the impact of accrued profits. DDBTD represents the component of BTD that cannot be explained by earnings management, providing a more precise measure of tax sheltering activity than BTD. Therefore, this paper also uses DDBTD as a measurement of tax avoidance behavior. The specific calculation formula for DDBTD is as follows:

This paper conducts an ordinary least squares (OLS) regression using the following equation: DDBTD can be calculated from Model (7), where $TACC_{it}$ is total accruals profit scaled by total assets; u_i is the average value of the residual for firm i over the sample period; and $\varepsilon_{i,t}$ is the deviation in year t from firm i's average residual u_i. The residual from this regression (DDBTD) can be used as a measure of tax avoidance, representing the part of the BTD that cannot be explained by accrued profit.

$$TACC = (profit\text{-}cash\ flow\ from\ operating\ activities)/\ total\ asset \quad (5)$$
$$BTD_{it} = \alpha * TACC_{it} + u_i + \varepsilon_{i,t} \quad (6)$$
$$DDBTD = u_i + \varepsilon_{i,t} \quad (7)$$

Each of the four indicators has its advantages and disadvantages. There is no optimal variable to measure tax avoidance accurately. Therefore, this paper adopts multiple indicators to reflect tax avoidance.

8.Model and Variables

In order to test whether tax avoidance affects the probability of forced CEO turnover, this paper uses Linear Probability Models (LPM) to verify the hypothesis (Chang & Wong, 2009; Chyz & Gaertner, 2017).

$$Forced\ CEO\ turnover_{i,t+1} = \alpha + \beta_1\ tax\ indicator_{i,t} + \beta_2\ control\ variables_{i,t} + I_j + T_t + \varepsilon_{i,t}\ (8)$$

This paper estimates model (8) and presents the results of ETR, cash ETR, BTD, and DDBTD, respectively.

This paper introduces a set of control variables to eliminate possible confounding effects. The control variables can be divided into two aspects. We use the variables of duality structure and CEO tenure to control for the characteristics of CEOs. Furthermore, this paper controls for firm characteristics through capital structure, corporate size, and company ownership.

Firstly, this paper uses the variables of duality and CEO tenure to control for the characteristics of CEOs. As a CEO's tenure increases, their position in the company becomes more stable, making them less likely to be replaced. According to Shen and Cannella (2002), managerial

turnover has a negative effect on a manager's tenure. Duality refers to the CEO concurrently serving as the chairman of the board of directors. It is difficult for the board of directors to restrain CEOs when they also hold the position of chairman. Furthermore, in such cases, the independence of the board of directors is reduced, and the probability of CEO turnover decreases (Kang and Shivdasani, 1995).

Secondly, this paper controls for three firm characteristics: capital structure, size, and ownership (Armstrong et al., 2012). The paper defines SIZE as the natural logarithm of the firm's total assets. According to Clayton et al. (2005), leverage is selected as the control variable since interest is deducted from the pre-tax profit as an expense when calculating corporate income tax, resulting in a lower effective tax rate for companies with higher leverage. In emerging markets, accounting performance indicators reflect a CEO's operating ability better than stock market indicators (Defond & Hung, 2004; Gibson, 2003). Since Chinese stock markets have low efficiency and high speculative characteristics, with stock prices not reflecting enterprise value and the CEO's ability, corporate performance is the main factor in CEO turnover. Therefore, this paper uses the accounting performance indicator (ROA) to measure profitability. Weisbach (1988) finds that companies with greater pre-tax profits have a lower tax rate, while Gupta and Newberry (1997) comes to the opposite conclusion, finding that high-profit companies have higher tax rates compared to low-profit companies. High-profit companies may face increased levels of supervision by tax authorities, reducing the motivation for tax avoidance. The dummy variable (State) indicates whether a listed firm is controlled by state or private shareholders. This paper also controls for industry-adjusted returns (AR) (Hubbard et al., 2017).

9.Empirical Results

9.1 Descriptive statistics

Table 4 presents descriptive statistics. The average tenure length is 5.286 years. Only 27.2% of CEOs serve as chairmen of the board in listed companies. The average leverage is 0.392, indicating that total liabilities account for one-third of total assets. The average ROA for all listed firms is 0.062. Among the four taxable avoidance variables, the average values of ETR and Cash-ETR are 0.171 and 0.523, respectively. The averages of BTD and DDBTD are 0.007 and 0.005, respectively.

9.2 Correlations

The Pearson correlation analysis between the main variables is shown in Table 5. In the table, "*, **, and ***" indicate the significance levels at 10%, 5%, and 1%, respectively.

(1) The correlation coefficient between the effective tax rate (ETR) and forced CEO turnover (TO_FORCE) is -0.024. The correlation coefficient between cash-ETR and TO_FORCE is -0.039. The correlation coefficients between BTD (DDBTD) and TO_FORCE are 0.043 and

0.037, respectively, and significant at the 1% level. This indicates that the higher the tax rate, the lower the level of tax avoidance, and the less likely the CEO is to be fired, which is consistent with hypothesis 1A.

(2) The correlation coefficients between STATE and the effective tax rate (ETR) and CASH_ETR are 0.130 and 0.103, respectively, and significant at 1%. This indicates that the effective tax rate in state-owned enterprises is higher than that in non-state-owned enterprises.

To ensure that multicollinearity is not a problem, this paper calculates the variance inflation factors (VIF) for each independent variable. All of the VIFs are less than 2, suggesting that our models are not prone to multicollinearity problems.

After conducting descriptive statistical analysis and the Pearson correlation analysis, this paper has gained a preliminary understanding of the relationship between tax rates and forced CEO turnover. In section 9, we will also conduct regression analysis.

9.3 Regression analysis

According to Chyz and Gaertner (2017), this paper utilizes the linear Probability Model with year and industry fixed effects (Jenter & Kanaan, 2015). Forced CEO turnover (TO_FORCE) is found to be negatively and significantly correlated with ETR and CASH_ETR, while BTD and DDBTD are positively and significantly correlated with TO_FORCE, consistent with hypothesis 1A. This suggests that lower tax rates are associated with higher tax avoidance and a higher likelihood of forced CEO turnover.

The regression results in Table 6 show that corporate performance (ROA) has a negative correlation with TO_FORCE, whereas LEV (asset-liability ratio) has a positive correlation with TO_FORCE. These findings indicate that higher asset-liability ratio increases financial risk and raises the likelihood of CEO termination. Shareholders may question the CEO's ability to raise funds and manage resources. Additionally, the results reveal a negative relationship between DUALITY and TO_FORCE, suggesting that CEOs with more power are less likely to be fired. Moreover, the coefficient of TENURE is significantly negative at 1%, indicating that longer CEO tenure is associated with a lower probability of removal.

The empirical test in Table 6 confirms the relationship between corporate tax avoidance and forced CEO turnover. Since state-owned enterprises comprise a significant part of listed companies in China, it is necessary to distinguish between the nature of property rights and explore the differences between state-owned and non-state-owned enterprises. Therefore, Table 7 shows the relationship in the sample of state-owned enterprises, where ETR and CASH-ETR are negatively correlated with TO_FORCE, and BTD and DDBTD are positively correlated with TO_FORCE, all significant at the 1% level. In comparison, Table 8 shows that the relationship between tax rates and forced CEO turnover is not significant in non-state-owned enterprises, which is consistent with Hypothesis 2.

Most CEOs in state-owned enterprises are appointed by the state, and these enterprises receive a significant proportion of resources from the government, making them subject to closer public scrutiny. Therefore, when state-owned enterprises pay less tax, the public questions the potential issue of tax avoidance, and the state-owned assets supervision and administration commission (SASAC) may choose to terminate the CEO's employment to reduce public criticism. Table 7 shows that the lower the effective tax rate of the state-owned enterprise group, the higher the degree of corporate tax avoidance, and the increased possibility of mandatory CEO turnover.

Non-state-owned enterprises aim to maximize their corporate value, and higher taxation expenses reduce the resources they can use. Therefore, tax planning is a significant part of CEOs' responsibilities. Compared to state-owned enterprises, non-state-owned enterprises use fewer government resources and mostly rely on their technology or products to achieve industry competitiveness and enhance corporate value. Hence, the degree of corporate tax avoidance has not become a significant reason for forced CEO turnover in non-state-owned enterprises.

10.Robustness Tests

In this subsection, the paper aims to ensure the robustness of the results by conducting a series of additional tests.

10.1Logit

In order to further support the hypothesis, this paper also conducts a logit model, which is presented in Table 11. In addition, we examine the relationship using marginal effects. The results are consistent with the findings obtained through the LPM model.

10.2Falsification tests

In order to verify that the primary results are not spurious, the study also conducts a falsification test. Specifically, we re-estimate our main tests by substituting Unforced CEO Turnover (NORMAL) for Forced CEO Turnover (TO_FORCE). According to Table 2, we obtain 1,154 normal CEO turnover cases, which are unlikely to be the result of organizational stress or crisis that drives board action to deliberately change its leader or firm strategy (Fee et al., 2013). The results of our falsification test are presented in Table 9, and they are in line with our expectations. The findings indicate that NORMAL CEO turnover is not significantly positively related to tax indicators.

10.3Added other control variables

Based on previous literature, earnings management (Hazarika et al., 2012) and information quality (Hutton et al., 2009) have an impact on forced CEO turnover. Therefore, we include these variables in our analysis, as shown in Table 10. After controlling for these factors, the

results are still consistent with the hypothesis.

11.Contributions

Our research expands the research perspective by investigating the impact of tax rates on forced CEO turnover from different theoretical angles. This helps us to gain a complete understanding of corporate tax avoidance and enriches the existing literature. Compared with previous studies, this paper has a significant impact on CEO succession and provides practical insights into corporate governance.

Firstly, this paper contributes to the existing literature on tax avoidance by providing a unique perspective from the lens of stakeholder theory (Li et al., 2022; Liu et al., 2022; Panayi, 2015; Schulman, 2020; Taylor & Richardson, 2013; Wen et al., 2020). While several studies have investigated the reasons and impacts of tax avoidance since the publication of Hanlon and Heitzman (2010), there are fewer papers that specifically analyze tax avoidance through the lens of stakeholder theory. Stakeholder theory recognizes that shareholders and society have distinct expectations when it comes to corporate tax planning. Moreover, by examining the relationship between tax avoidance and forced CEO turnover, this paper sheds light on how tax strategies also impact the stability of CEOs. It highlights the potential consequences that tax avoidance may have on CEO turnover. By incorporating stakeholder theory into the analysis, this paper not only enriches the existing literature but also provides valuable insights into the complexities surrounding tax avoidance and its consequences.

Secondly, this study provides a comprehensive perspective on forced CEO turnover. CEO turnover is a hot topic in current research, but the existing literature has mainly focused on the impact of corporate performance on CEO turnover. There are few studies analyzing the relationship between tax avoidance and forced CEO turnover.

Different from Chyz and Gaertner (2017), this paper provides evidence of a relationship between low tax payments and forced CEO turnover. It also finds that a high tax rate increases the likelihood of forced CEO turnover.This paper extends its analysis to emerging countries, specifically focusing on the Chinese context, which includes state ownership and the social responsibilities of state-owned enterprises (SOEs). This extension helps in developing a deeper understanding of the relationship between corporate tax avoidance and CEO turnover within the specific characteristics of Chinese companies in emerging markets. By examining the dynamics of CEO turnover and tax avoidance in emerging economies, considering unique institutional, regulatory, and cultural factors, we discover a negative relationship between tax rates and forced CEO turnover. Furthermore, this paper reveals the increased social pressure faced by state-owned enterprises (SOEs) due to their additional social responsibilities. In summary, both papers investigate the relationship between corporate tax outcomes and forced CEO turnover. This paper explores the impact of tax avoidance on CEO turnover in the Chinese A-share market and considers the influence of different ownership structures. It emphasizes the negative relationship between tax rates and forced CEO turnover and highlights the significance of social responsibilities, particularly for state-owned enterprises.

Furthermore, the practical implications of these findings are noteworthy. The study's identification of the relationship between tax outcomes and forced CEO turnover suggests that organizations should consider the tax planning capabilities of their CEOs when making decisions related to executive appointments and performance evaluations. Moreover, the research underscores the significance of providing appropriate training and resources to CEOs regarding tax planning. This highlights the need for organizations to ensure that their executives possess the necessary knowledge and understanding of tax strategy to make informed decisions and effectively manage tax-related issues.

Table 1 Reasons for CEO turnover presented in CSMAR database

Reasons	Freq.	Percent
Change of job	490	28.81%
Retirement	46	2.70%
Contract expiration	473	27.81%
Change in controlling shareholders	3	0.18%
Resignation	160	9.41%
Dismissal	13	0.76%
Health	34	2.00%
Personal reasons	207	12.17%
Corporate governance reform	94	5.53%
Legal disputes	4	0.24%
Completion of acting duties	76	4.47%
No reason given	101	5.94%
Total	1701	100.00%

Table 2 Classification of forced and voluntary CEO turnover

Reasons for turnover	Number of observations	Frequency (%)
1.Normal turnover	1154	67.84%
Retirement	38	2.23%
Contract expiration	473	27.81%
Change in controlling shareholders	3	0.18%
Health	34	2.00%
Corporate governance reform	94	5.53%
Legal disputes	4	0.24%
Completion of acting duties	76	4.47%
Important government position taken up	5	0.29%
Remaining as board chairman or vice chairman	241	14.17%
Promoted to board chairman or vice chairman	186	10.93%
2. Forced turnover	547	32.16%
New position ranked lower than CEO position	78	4.59%
retirement age less than 60	8	0.47%
Dismissed	13	0.76%
Information unavailable	448	26.34%
Total number of observations	1701	100.00%

Table 3 Variable Definitions

Variables	Variables Name	Definition
Explained Variables	ETR	ETR equals tax expenditure to pre-tax income.
	CASH_ETR	CASH_ETR equals cash tax payment to pre-tax income.
	BTD	Book-tax difference (BTD) means the total differences between the book and taxable incomes.
	DDBTD	DDBTD represents the part of the BTD that cannot be explained by accrued profit.
Explanatory Variables	TO_FORCE	TO_FORCE is a dummy variable that equals one if there is a forced turnover and zero otherwise.
Normal CEO turnover	NORMAL	NORMAL is a dummy variable that equals one when a CEO has normal turnover and zero otherwise.
Control Variables	STATE	STATE equals one if a company's ultimate owner is the central government or a local government, and zero is non-SOEs.
	TENURE	Tenure indicates the number of years that a CEO has served in a listed firm.
	SIZE	Size means the size of a listed firm, measured as the natural logarithm of the book value of total assets.
	AR	Firm's industry-adjusted annual stock return (including dividends).
	DUALITY	DUALITY is a dummy variable that equal to one if the CEO is also the Chairman of the board.
	LEV	Leverage is defined as total liabilities divided by total assets.
	ROA	ROA equals net income divided by total assets.

Table 4 Descriptive Statistics

Variables	Number	Mean	Standard Deviation	Minimum	Median	Maximum
Panel A: Control variables						
STATE	10695	0.381	0.486	0	0	1
TENURE	10695	5.285	2.669	1	4.83	15.28
SIZE	10695	22.095	1.214	19.629	21.924	26.064
AR	10695	0.005	0.36	-0.729	-0.057	1.463
LEV	10695	0.414	0.201	0.057	0.406	0.875
ROA	10695	0.062	0.038	0.009	0.041	0.193
DUALITY	10695	0.267	0.443	0	0	1
Panel B: Performance variables						
TO FORCE	10695	0.027	0.163	0	0	1
ETR	10695	0.171	0.071	-0.011	0.158	0.365
CASH_ ETR	10695	0.523	0.222	-0.005	0.503	0.990
BTD	10695	0.007	0.027	-0.058	0.003	0.102
DDBTD	10695	0.005	0.027	-0.066	0.003	0.092

Variable definitions:

The ETR (effective tax rate) is calculated as tax expenditure divided by pre-tax income. CASH_ETR represents the cash tax payment divided by pre-tax income. Book-tax difference (BTD) refers to the total difference between book and taxable incomes. DDBTD represents the portion of the BTD that cannot be explained by accrued profit. TO_FORCE is a dummy variable that takes the value of 1 if there is forced turnover and 0 otherwise. STATE equals 1 if a company's ultimate owner is the central government or a local government, and 0 is non-SOEs. Tenure indicates the number of years a CEO has served in a listed firm. SIZE refers to the size of a listed firm, measured as the natural logarithm of the book value of total assets. AR represents the firm's industry-adjusted annual stock return (including dividends). DUALITY equals 1 if the CEO also serves as chairman, and 0 otherwise. LEV is defined as total liabilities divided by total assets, while ROA represents net income divided by total assets.

Table 5 Pearson correlation analysis

The following table presents the Pearson correlation analysis results for the full sample. Forced CEO Turnover is measured in the t+1 period, while all other variables are measured in the t period. Statistical significance levels are denoted by *, **, and ***, indicating 10%, 5%, and 1% significance levels, respectively.

VARIABLES	STATE	TENURE	SIZE	AR	LEV	ROA	DUALITY	TO FORCE	ETR	CASH_ETR	BTD	DDBTD
STATE	1											
TENURE	0.100***	1										
SIZE	0.359***	0.038***	1									
AR	-0.011	0.001	-0.034***	1								
LEV	0.293***	0.022**	0.554***	0.051***	1							
ROA	-0.102***	0.004	-0.121***	0.044***	-0.347***	1						
DUALITY	-0.286***	0.011	-0.193***	0.021**	-0.148***	0.030***	1					
TO FORCE	0.049***	-0.118***	0.056***	-0.002	0.037***	-0.065***	-0.025***	1				
ETR	0.130***	0.0180*	0.200***	-0.022**	0.226***	-0.138***	-0.074***	-0.024**	1			
CASH_ETR	0.103***	0.041***	0.129***	-0.046***	0.220***	-0.285***	-0.066***	-0.039***	0.295***	1		
BTD	0.020**	-0.002	-0.053***	0.006	-0.114***	0.297***	-0.016*	0.043***	-0.496***	-0.286***	1	
DDBTD	0.030***	-0.008	-0.027***	0.011	-0.094***	0.215***	-0.010	0.037***	-0.392***	-0.212***	0.788***	1

Variable definitions:

The ETR (effective tax rate) is calculated as tax expenditure divided by pre-tax income. CASH_ETR represents the cash tax payment divided by pre-tax income. Book-tax difference (BTD) refers to the total difference between book and taxable incomes. DDBTD represents the portion of the BTD that cannot be explained by accrued profit. TO_FORCE is a dummy variable that takes the value of 1 if there is forced turnover and 0 otherwise. STATE equals 1 if a company's ultimate owner is the central government or a local government, which is SOEs and 0 is non-SOEs. Tenure indicates the number of years a CEO has served in a listed firm. SIZE refers to the size of a listed firm, measured as the natural logarithm of the book value of total assets. AR represents the firm's industry-adjusted annual stock return (including dividends). DUALITY equals 1 if the CEO also serves as chairman, and 0 otherwise. LEV is defined as total liabilities divided by total assets, while ROA represents net income divided by total assets.

Table 6 The impact of tax rates on forced CEO turnover

FULL SAMPLE	1	2	3	4
	TO_FORCE	TO_FORCE	TO_FORCE	TO_FORCE
STATE	0.011	0.011	0.012	0.012
	(0.645)	(0.688)	(0.688)	(0.713)
TENURE	-0.018***	-0.018***	-0.018***	-0.018***
	(-6.383)	(-6.376)	(-6.380)	(-6.392)
SIZE	-0.062	-0.066	-0.065	-0.071*
	(-1.460)	(-1.573)	(-1.562)	(-1.701)
AR	-0.002	-0.002	-0.001	-0.001
	(-0.541)	(-0.605)	(-0.393)	(-0.409)
LEV	1.322***	1.338***	1.329***	1.337***
	(4.810)	(4.842)	(4.892)	(4.891)
ROA	-0.062	-0.096	-0.197	-0.089
	(-0.370)	(-0.492)	(-0.701)	(-0.432)
DUALITY	-0.060	-0.055	-0.044	-0.049
	(-0.490)	(-0.461)	(-0.363)	(-0.411)
ETR	-0.130***			
	(-3.658)			
CASH_ETR		-0.037**		
		(-2.517)		
BTD			0.242***	
			(2.633)	
DDBTD				0.236**
				(2.428)
_cons	-0.341***	-0.305**	-0.373***	-0.375***
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	10695	10695	10695	10695
adj. *R2*	0.022	0.022	0.022	0.022
F	10.869	10.784	10.904	10.766

The table displays the results of our main tests, which examine the effect of taxes on forced CEO turnover using a Linear Probability Model (LPM). Forced CEO Turnover is measured in the t+1 period, while all other variables are measured in the t period. Statistical significance levels are denoted by *, **, and ***, indicating 10%, 5%, and 1% significance levels, respectively.

Variable definitions are as follows: The ETR (effective tax rate) is calculated as tax expenditure divided by pre-tax income. CASH_ETR represents the cash tax payment divided by pre-tax income. Book-tax difference (BTD) refers to the total difference between book and taxable incomes. DDBTD represents the portion of the BTD that cannot be explained by accrued profit. TO_FORCE is a dummy variable that takes the value of 1 if there is forced turnover and 0 otherwise. STATE equals 1 if a company's ultimate owner is the central government or a local government, which is SOEs and 0 is non-SOEs. Tenure indicates the number of years a CEO has served in a listed firm. SIZE refers to the size of a listed firm, measured as the natural logarithm of the book value of total assets. AR represents the firm's industry-adjusted annual stock return (including dividends). DUALITY equals 1 if the CEO also serves as chairman, and 0 otherwise. LEV is defined as total liabilities divided by total assets, while ROA represents net income divided by total assets.

Table 7 The impact of tax rates on forced CEO turnover in SOEs

SOE	1	2	3	4
	TO_FORCE	TO_FORCE	TO_FORCE	TO_FORCE
TENURE	-0.023***	-0.024***	-0.023***	-0.024***
	(-5.451)	(-5.530)	(-5.443)	(-5.443)
SIZE	-0.056	-0.061	-0.065	-0.073
	(-0.982)	(-1.091)	(-1.152)	(-1.281)
AR	0.004	0.003	0.004	0.004
	(0.407)	(0.382)	(0.449)	(0.444)
LEV	0.895*	0.917**	0.824*	0.825*
	(1.942)	(2.041)	(1.812)	(1.781)
ROA	-0.021	-0.022	-0.094	-0.035
	(-0.571)	(-0.551)	(-0.551)	(-0.342)
DUALITY	0.018	0.015	0.019	0.017
	(1.177)	(1.017)	(1.240)	(1.157)
ETR	-0.375***			
	(-5.437)			
CASH_ETR		-0.162***		
		(-5.437)		
BTD			0.892***	
			(4.217)	
DDBTD				1.013***
				(4.449)
_cons	-0.406	-0.272	-0.533**	-0.544**
	(-1.642)	(-1.089)	(-2.144)	(-2.207)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	3615	3615	3615	3615
adj. R2	0.044	0.047	0.043	0.045
F	6.449	6.624	6.476	6.550

This table presents the results of our primary tests examining the impact of taxes on forced CEO turnover in SOEs, using a Linear Probability Model. Forced CEO turnover is measured in the t+1 period, while all other variables are measured in the t period. Statistical significance levels are indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Variable definitions are as follows: The ETR (effective tax rate) is calculated as tax expenditure divided by pre-tax income. CASH_ETR represents the cash tax payment divided by pre-tax income. Book-tax difference (BTD) refers to the total difference between book and taxable incomes. DDBTD represents the portion of the BTD that cannot be explained by accrued profit. TO_FORCE is a dummy variable that takes the value of 1 if there is forced turnover and 0 otherwise. STATE equals 1 if a company's ultimate owner is the central government or a local government, which is SOEs and 0 is non-SOEs. Tenure indicates the number of years a CEO has served in a listed firm. SIZE refers to the size of a listed firm, measured as the natural logarithm of the book value of total assets. AR represents the firm's industry-adjusted annual stock return (including dividends). DUALITY equals 1 if the CEO also serves as chairman, and 0 otherwise. LEV is defined as total liabilities divided by total assets, while ROA represents net income divided by total assets.

Table 8 The impact of tax rates on forced CEO turnover in non-SOEs

NON-SOEs	1	2	3	4
	TO_FORCE	TO_FORCE	TO_FORCE	TO_FORCE
TENURE	-0.012***	-0.012***	-0.012***	-0.012***
	(-3.369)	(-3.404)	(-3.365)	(-3.364)
SIZE	-0.056	-0.058	-0.047	-0.052
	(-0.891)	(-0.961)	(-0.791)	(-0.880)
AR	-0.004	-0.004	-0.004	-0.004
	(-1.247)	(-1.112)	(-1.261)	(-1.280)
LEV	1.374***	1.373***	1.375***	1.401***
	(3.811)	(3.751)	(3.911)	(3.962)
ROA	-2.930	-3.786*	-4.142*	-3.346
	(-1.351)	(-1.691)	(-1.741)	(-1.481)
DUALITY	-0.023	-0.023	-0.018	-0.020
	(-0.163)	(-0.162)	(-0.132)	(-0.141)
ETR	0.019			
	(0.485)			
CASH_ETR		0.028*		
		(1.711)		
BTD			-0.016	
			(-0.165)	
DDBTD				-0.091
				(-0.908)
_cons	-0.357**	-0.406***	-0.353**	-0.350**
	(-2.391)	(-2.652)	(-2.409)	(-2.399)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	7080	7080	7080	7080
adj. R^2	0.014	0.015	0.014	0.014
F	5.673	5.634	5.663	5.618

This table presents the results of our primary tests exploring the impact of taxes on forced CEO turnover using a Linear Probability Model in non-SOEs. The table displays the regression coefficients and standard errors side by side. Forced CEO Turnover is measured in the t+1 period, while all other variables are measured in the t period. The symbols *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Variable definitions: The ETR (effective tax rate) is calculated as tax expenditure divided by pre-tax income. CASH_ETR represents the cash tax payment divided by pre-tax income. Book-tax difference (BTD) refers to the total difference between book and taxable incomes. DDBTD represents the portion of the BTD that cannot be explained by accrued profit. TO_FORCE is a dummy variable that takes the value of 1 if there is forced turnover and 0 otherwise. STATE equals 1 if a company's ultimate owner is the central government or a local government, which is SOEs and 0 is non-SOEs. Tenure indicates the number of years a CEO has served in a listed firm. SIZE refers to the size of a listed firm, measured as the natural logarithm of the book value of total assets. AR represents the firm's industry-adjusted annual stock return (including dividends). DUALITY equals 1 if the CEO also serves as chairman, and 0 otherwise. LEV is

defined as total liabilities divided by total assets, while ROA represents net income divided by total assets.

Table 9 Falsification Test

	1	2	3	4
	NORMAL	NORMAL	NORMAL	NORMAL
STATE	-0.0298	-0.029	-0.029	-0.030
	(-0.914)	(-0.902)	(-0.900)	(-0.914)
TENURE	-0.035***	-0.035***	-0.035***	-0.035***
	(-9.585)	(-9.589)	(-9.588)	(-9.582)
SIZE	-0.008	-0.008	-0.007	-0.008
	(-1.554)	(-1.462)	(-1.369)	(-1.420)
AR	-0.008*	-0.008*	-0.008*	-0.007*
	(-1.727)	(-1.707)	(-1.724)	(-1.701)
LEV	-0.033	-0.033	-0.033	-0.032
	(-1.048)	(-1.058)	(-1.060)	(-1.030)
ROA	0.005	0.020	0.022	-0.012
	(0.042)	(0.160)	(0.190)	(-0.110)
DUALITY	-0.066***	-0.066***	-0.066***	-0.066***
	(-5.654)	(-5.652)	(-5.656)	(-5.636)
ETR	-0.0238			
	(-0.4681)			
CASH_ETR		-0.002		
		(-0.110)		
BTD			0.029	
			(0.218)	
DDBTD				0.138
				(0.895)
_cons	-0.642***	-0.651***	-0.646***	-0.653***
	(-3.875)	(-3.860)	(-3.902)	(-3.930)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	10695	10695	10695	10695
adj. R^2	0.04	0.04	0.04	0.04
F	31.829	31.853	31.855	31.821

This table presents the outcomes of our falsification tests that explore the impact of taxes on unforced CEO turnover using a Linear Probability Model. The table displays the regression coefficients and standard errors alongside each other. Forced CEO turnover is measured in the t+1 period, while all other variables are measured in the t period. Statistical significance is denoted by *, **, and ***, representing the 10 percent, 5 percent, and 1 percent levels, respectively.

Variable definitions: The ETR (effective tax rate) is calculated as tax expenditure divided by pre-tax income. CASH_ETR represents the cash tax payment divided by pre-tax income. Book-tax difference (BTD) refers to the total difference between book and taxable incomes. DDBTD represents the portion of the BTD that cannot be explained by accrued profit. TO_FORCE is a dummy variable that takes the value of 1 if there is forced turnover and 0 otherwise. STATE equals 1 if a company's ultimate owner is the central government or a local government, which is SOEs and 0 is non-SOEs. Tenure indicates the number of years a CEO has served in a listed firm. SIZE refers to the size of a listed firm, measured as the natural logarithm of the book value of total assets. AR represents the firm's industry-adjusted annual stock return (including

dividends). DUALITY equals 1 if the CEO also serves as chairman, and 0 otherwise. LEV is defined as total liabilities divided by total assets, while ROA represents net income divided by total assets.

Table 10 Robustness tests

VARIABLES	ETR	CASH_ETR	BTD	DDBTD
(1) Controlling for earnings management	-0.153***	-0.049***	0.231**	0.229**
	(-3.786)	(-3.011)	(2.210)	(2.199)
(2) Controlling for information quality	-0.226***	-0.078***	0.357***	0.371***
	(-4.389)	(-3.852)	(2.599)	(2.778)
(3) Full model	-0.228***	-0.073***	0.314**	0.335***
	(-4.382)	(-3.472)	(2.188)	(2.416)
(4) Estimating using Logit instead of OLS-FULL SAMPLE	-11.008***	-3.081***	12.958***	13.644***
	(-4.722)	(-3.994)	(2.721)	(2.835)
(5) Estimating using Logit instead of OLS-SOEs SAMPLE	-17.906***	-6.940***	31.677***	35.356***
	(-4.833)	(-4.987)	(3.969)	(4.385)
(6) Estimating using Logit instead of OLS-NON-SOEs SAMPLE	-5.890*	-0.582	2.325	0.635
	(-1.737)	(-0.569)	(0.364)	(0.099)
(7) Margin effects-FULL SAMPLE	-0.088***	-0.038***	0.022***	0.019***
	(-3.738)	(-4.752)	(3.457)	(3.043)
(8) Margin effects-SOEs SAMPLE	-0.022***	-0.010***	0.064***	0.064***
	(-4.888)	(-3.907)	(4.576)	(4.677)
(9) Margin effects-NON-SOEs SAMPLE	0.004	0.000	-0.008	-0.019
	(0.133)	(0.016)	(-0.117)	(-0.289)

The symbols *, **, and *** represent statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively. This table displays the coefficients and standard errors for our variables of interest in a series of robustness tests. The table shows several variations of our primary outcomes, but for brevity, we report only the coefficients for ETR, CASH_ETR, BTD, and DDBTD. The complete estimation outcomes are available from the authors upon request. The robustness tests are estimated in ten groupings, (1) to (10): (1) includes ABSDA to control for earnings management, (2) includes OPAQUE to control for information quality, (3) combines all variables used in (1) and (2)with the base model, (4) employs LOGIT to estimate instead of the Linear Probability Model, (5) uses LOGIT to estimate SOEs, (6) uses LOGIT to estimate non-SOEs. (7) presents the complete marginal effects in the samples, (8) presents the marginal effects in SOEs, and (9) presents the marginal effects in non-SOEs.

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Chapter 2: The impact of risks on forced CEO turnover

Abstract:
Risk management is a prominent topic since the 2008 financial crisis, and it has become a critical area of business management. The board of directors needs to evaluate the CEO's ability and competence. This study investigates the impact of various risks on forced CEO turnover through a linear probability model (LPM). The paper selects the Chinese A-share market from 2010 to 2019 as a sample, and empirical research is combined to explore the effect of different risks on forced CEO turnover. Furthermore, the study analyzes the relationship under different ownership structures. The research findings reveal that crash risk is positively associated with forced CEO turnover. As an emerging market with a unique legal and social environment, SOEs and non-SOEs have different risk attitudes due to their different goals in China. Therefore, it is essential to distinguish ownership when evaluating the Chinese situation. Additionally, the study shows that idiosyncratic risk increases the likelihood of forced CEO turnover, and this relationship is more significant in non-SOEs than in SOEs. However, systematic risk does not influence forced CEO turnover. Risks can serve as a valuable indicator of a CEO's ability and competence. Finally, the study supports the findings of Bushman et al. (2010), who evaluated the relationships in the American context.
Keywords: risks, stock price crash risk, CEO turnover

1.Introduction

CEO turnover is an important event in corporate governance (Clayton et al., 2005). The dismissal of a CEO is an effective way to rebuild a company's reputation and restore shareholders' confidence (Jensen & Meckling, 1976; Suchman, 1995). This paper investigates the relationship between various risks and forced CEO turnover.

According to Andreou et al. (2017), crash risk primarily stems from managers hiding bad news instead of releasing it in a timely manner for their own benefit. Once the accumulated bad news reaches the limit point, all the negative information will flow to the market in a very short time, leading to stock price crashes (Hutton et al., 2009; Kim et al., 2011a). The risk of a stock price collapse not only directly leads to substantial damage to existing shareholders' wealth but also harms the company's performance due to subsequent financial difficulties and the loss of customers and suppliers.

Risk management has been a critical issue since the 2008 financial crisis. Bushman et al. (2010) find that idiosyncratic risk increases CEO turnover while systematic risk reduces it. This paper evaluates the relationship in Chinese circumstances. The root of idiosyncratic risk is the uncertainty of information quality (Brandt et al., 2010; Brown & Kapadia, 2007). Improving information quality decreases idiosyncratic risk, which decreases information asymmetry and helps the board to evaluate a CEO's talent accurately.

We selected Chinese A-share listed companies from 2010 to 2019 as samples to investigate the impact of risks on CEO turnover. The results show a significant positive correlation between crash risks and CEO turnover. Idiosyncratic risk increases the likelihood of forced CEO turnover. In addition, the relationship is more significant in non-SOEs than in SOEs. The board of directors should consider risk information when evaluating a CEO's talent.

Contributions

This paper analyzes the impact of different risks on CEO turnover from a Chinese perspective and has the following contributions. Firstly, the existing literature focuses on the determinants of crash risk, and few studies concern the consequences of stock price crash risk (Habib et al., 2018). This paper investigates the impact of crash risk on CEO turnover and provides a comprehensive perspective on crash risk. In addition, crash risk as a non-performance indicator can evaluate a CEO's talent. Additionally, many studies analyze the factors influencing idiosyncratic risks, such as the capital market environment and firm performance. This paper connects CEO turnover, systematic risk, and idiosyncratic risk together, which links a company's internal and external economic factors. Thirdly, because of the different governance mechanisms of SOEs and non-SOEs, this paper investigates the relationship between CEO turnover and corporate risk under different ownerships.

The remainder of the paper is organized as follows. Section 2 presents the literature review, and the development of the hypothesis is shown in Section 3. Section 4 describes the model, data, and variables. This paper presents the results and takes robustness tests in Sections 5 and 6. In section 7, this paper summarizes the conclusions.

2.Literature Review

2.1 CEO turnover

The CEO is the core of the management team, who is responsible for deciding and implementing major issues, including organizational strategy, risk management and social responsibility. One of the critical roles of the CEO is to control uncertainty (Daily & Dalton, 1995). The principal-agent conflict arises from the diverging goals of managers and owners (Jensen & Meckling, 1976). Effective corporate governance mechanisms can properly evaluate a CEO's talent and replace an inability CEO. Forced CEO turnover can be a mechanism to reduce agency costs (Chang & Wong, 2009). Many studies investigate the factors and impact of CEO turnover (Clayton et al., 2005; Wiersema & Zhang, 2013). This paper focuses on forced CEO turnover as a research object. The influencing factors of CEO turnover include internal governance and the external environment. Much literature finds a positive influence after CEO turnover (Bernard et al., 2016; Shen & Cannella, 2002). CEO turnover improves performance (Huson et al., 2001; Kato & Long, 2006). Firms experience increased ROA following CEO turnover (Huson et al., 2004). Performance and productivity improve after a forced turnover (Dasgupta et al., 2018).

2.1.1 Performance

Many studies have shown that corporate performance is the key determinant of CEO turnover (Denis et al., 1997; Fiordelisi & Ricci, 2014; Fisman et al., 2014; He et al., 2011; Jenter & Kanaan, 2015; Jenter & Lewellen, 2021). CEOs are fired after bad firm performance relative to the industry average (Eisfeldt & Kuhnen, 2013; Fee et al., 2018; Harris & Raviv, 2008). Cheng et al. (2020) find that CEOs have strong incentives to inflate earnings to avoid being fired. Desai and Dharmapala (2009) show that companies that experience restatement have a higher turnover rate.

2.1.2 Board of directors

The main responsibility of the board is employing, dismissing, supervising, and compensating management to maximize shareholders' value. The increasing independence of the board tends to make discipline more rigorous for CEOs (Guo & Masulis, 2015; Weisbach, 1988; Zhu & Shen, 2016). Ownership also affects the possibility of CEO turnover. Family involvement on boards reduces CEO turnover (Chen et al., 2013; Gonzalez et al., 2015).

2.1.3 CEO personal characteristics

Jo and Harjoto (2011) find that CEOs seek to reduce the likelihood of being fired through overinvestment in CSR. CEOs with too high or too low optimism attitudes are more likely to be forced to leave (Campbell et al., 2011). It has been found that CEOs with more power have a lower turnover rate (Ting, 2013).

2.1.4 Compensation

The board of directors often cuts the CEO's salary sharply instead of resigning (Gao et al., 2012). Inderst and Mueller (2010) show that incentive pay induces "bad" CEOs to quit. Chakraborty et al. (2009) find a positive correlation between CEO turnover and corporate incentives.

From an external perspective, a country's political system, legal system, and economic environment can affect corporate governance and the stability of CEOs (Jenter & Kanaan, 2015). Lawsuits often result in increased CEO turnover (Aharony et al., 2015; Defond & Hung, 2004; Karpoff et al., 2008). Media reports, particularly negative ones, can put pressure on the enterprise, and the corporation may replace the CEO to restore the company's reputation (Farrell & Whidbee, 2002). Farrell and Whidbee (2002) suggest that media reports influence public perception, which can affect CEO turnover. They find evidence that increased scrutiny of poor firm performance by the financial press increases the likelihood of CEO turnover. According to Wiersema and Zhang (2013), a negative rating from securities analysts accelerates the decision to dismiss a CEO, because adverse reports can affect the board's evaluation on the

CEO's abilities.

2.1.5 The research on China

In China, the government plays a significant role in resource allocation, which can significantly influence a firm (Li et al., 2008). A CEO with political connections is less likely to be fired (You & Du, 2012). There are significant differences between SOEs and non-SOEs (Chang & Wong, 2009; Conyon & He, 2011; Firth et al., 2006; Kato & Long, 2004). The China Securities Regulatory Commission (CSRC) has required enterprises to disclose detailed reasons for CEO turnover since 2000. There are 12 reasons for CEO turnover, including retirement, expiration of tenure, job transfer, dismissal, health problems, personal problems, and resignation. Previous studies typically distinguish between normal and forced turnover (Chang & Wong, 2009). Normal turnover refers to reasons unrelated to management behaviors, such as retirement, health issues, expiration of terms, etc. There is no consistent definition of forced turnover. According to Cao et al. (2017), forced CEO turnover refers to situations when an executive unexpectedly terminates their position (excluding death or health problems) without a named successor, leaves for undisclosed personal reasons, or resigns due to scandal or performance-related issues.

Overall, CEO turnover is a significant event that can influence the market and the corporation. Internal factors are the primary reasons for CEO turnover.

2.2 Crash risk

It is crucial to understand the risk of a stock price crash because it can significantly impact the stability of the capital market. Many studies have analyzed the factors that influence stock price crashes (Kim et al., 2011a), such as corporate disclosures, managerial incentives, corporate characteristics, corporate governance mechanisms, and outside inspectors. However, only a few studies have investigated the consequences of a stock price crash. According to agency theory, managers may hide bad news for self-interest, which can prevent shareholders from accurately understanding the true situation of the company. Once bad news becomes public, the stock price will experience a significant drop. Thus, the nature of crash risk is information asymmetry (Bleck & Liu, 2007). External supervisors such as auditors, analysts, and the government, along with effective corporate governance mechanisms, can curb opportunistic managerial behavior and reduce the risk of stock price crashes.

Managers can use various approaches to hoarding bad news, such as earnings manipulation and tax avoidance, which worsen the quality of information and increase the risk of stock price crashes (Cohen et al., 2014). Transparent disclosures reduce information asymmetry and lessen the need for bad news hoarding, thereby reducing crash risk (De Franco et al., 2011; Graham et al., 2020).

CEOs, as leaders of management teams, influence crash risk. Habib et al. (2018) find that companies with higher innovation costs suffer a higher crash risk. Overconfident CEOs are more likely to experience a stock price crash (Kim et al., 2016). CEOs with a financial incentive to hoard bad news are also more likely to experience stock price crashes (Andreou et al., 2017; Benmelech et al., 2010; Kothari et al., 2009). There is a higher crash risk for CEOs with equity-based compensation, since this exacerbates management's motivation to conceal bad news and increases the risk of a stock price crash (Kim et al., 2011).

Corporate governance significantly influences crash risk (Chen et al., 2017). Companies with a higher quality of internal control show a lower crash risk (Be´dard et al., 2004; Larcker et al., 2007; Xie et al., 2003). Companies can decrease crash risk by improving social trust (Callen & Fang, 2015; Li et al., 2017). Companies engaged in CSR activities convey a positive image to society, accumulate reputation costs, enhance shareholder value, and decrease financing costs (Clayton et al., 2005; Orlitzky, 2009). Zhou et al. (2021) find that CSR reduces crash risk significantly. Implementing relevant investor protection laws can also reduce the risk of stock price crashes (Bhargava et al., 2017; Hutton et al., 2009; Kubick & Lockhart, 2016). The emergence of government audits increases the disclosure requirement and reduces the risk of stock price collapse.

The United States dominates research on crash risk. A number of studies in China show that firms with a government connection face a lower crash risk (Chen et al., 2020; Li & Chan, 2016). Xu et al. (2013) report that managers with excess rewards tend to hold bad news in SOEs. Executives fear penalties for releasing negative news related to politically sensitive events, which increases the crash risk (Lee & Wang, 2016; Piotroski et al., 2015).

2.3 Idiosyncratic risk and systematic risk

Traditional financial theory differentiates risk into systematic risk and idiosyncratic risk, which assumes that the capital market is efficient, investors are rational, and information is complete (Bernile et al., 2018). Systematic risk is related to market factors, such as monetary policy, exchange rate fluctuations, and tax policies, that companies cannot control or eliminate from the market. Therefore, it is also known as "Market Risk" or "Undiversifiable Risk". Many studies analyze the determinants and impacts of systematic risk (Bali & Cakici, 2008). Various factors can influence systematic risk, such as earnings announcements (Patton & Verardo, 2012), stock splits (Green & Hwang, 2009), financial derivatives (Bartram et al., 2011), and accounting information quality (Xing & Yan, 2018).

Unsystematic risk is controllable by firms' internal factors. Investors can completely disperse risk through a diversified portfolio. It is also called "Specific Risk", "Diversifiable Risk", or "Idiosyncratic Risk". Rather than macroeconomic factors, idiosyncratic risk reflects microeconomic factors. Idiosyncratic risk is critical as CEOs can control and constrain it (Sassen et al., 2016). Furthermore, it represents 80% of total risks (Bansal & Clelland, 2004). The determining factors of idiosyncratic risk are still unclear.

Several studies analyze idiosyncratic risks associated with CEO characteristics, earnings management, information quality, and expected return dimensions (Fu, 2009; Goyal & Santa-Clara, 2003). Few studies investigate the causes of idiosyncratic volatility from a corporate governance perspective.

2.3.1 The relationship between CEO and risk

According to the Upper Echelons Theory, managers' risk attitude, experience (Mishra, 2020), gender, socioeconomic background (Gormley & Matsa, 2016), and other characteristics can also influence risk management (Belghitar & Clark, 2012; Brandt et al., 2010; Gormley & Matsa, 2016). Managing firm-specific risk is a crucial responsibility of management (Rumelt, 1982). Faccio et al. (2016) demonstrate that female CEOs are associated with lower risks. Tan and Liu (2016) suggest that CEOs with higher abilities are better able to control idiosyncratic risk. Additionally, Chok and Sun (2007) discover that younger managers may face higher idiosyncratic risk as they are more likely to take on risky corporate strategies.

2.3.2 Firm characteristics

Firm characteristics such as ownership (Panousi & Papanikolaou, 2012), firm age (Huang et al., 2014), and leverage level (Gerlach et al., 2015) affect idiosyncratic risk. Ownership concentration is positively associated with idiosyncratic risk (Abu-Ghunmi et al., 2015; Anderson & Reeb, 2003; Chen & Petkova, 2010; Maury, 2006; Nguyen, 2011; Villalonga & Amit, 2006). Companies' performance and size have a negative influence on idiosyncratic risk (Bali & Cakici, 2008; Bennett & Sias, 2006; Brown & Kapadia, 2007; Irvine & Pontiff, 2009; Vozlyublennaia, 2011). Effective corporate governance also reduces idiosyncratic risk (Ferreira & Laux, 2007). In addition, there is a negative correlation between idiosyncratic risk and expected return (Gilchrist et al., 2014; Panousi & Papanikolaou, 2012; Ang et al., 2008; Long et al., 2018). Firms with increased idiosyncratic risk face higher discount rates (Jagannathan & Pritchard, 2017; Jagannathan et al., 2016).

2.3.4 Information effects

A stream of research documents that idiosyncratic risk has informational effects (Campbell et al., 2001; Campbell & Taksler, 2003; Durnev et al., 2004; Ferreira & Laux, 2007; Goyal & Santa-Clara, 2003; Morck et al., 2000). Many studies document that high information quality reduces idiosyncratic risk (Angeletos, 2007; Rajgopal & Venkatachalam, 2011). Idiosyncratic risk differs across firms and countries (Bartram et al., 2012; Bartram et al., 2011; Brown & Kapadia, 2007; Datta et al., 2017; Morck et al., 2000). Li et al. (2004) show that idiosyncratic risk has increased significantly in emerging markets.

3. Hypothesis Development

3.1 Analyze the impaction of crash risk on forced CEO turnover

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When a firm experiences a crash, it often indicates deficiencies in risk monitoring, internal controls, or strategic decision-making processes (Jin and Myers, 2006; Callen and Fang, 2015; Andreou et al., 2017; Bleck and Liu, 2007). This, in turn, significantly impacts investor confidence as they question the ability of the CEO and the board to safeguard their interests and navigate turbulent market conditions. Furthermore, the decline in financial performance and firm value creates a compelling rationale for CEO dismissal (Cui et al., 2019; Habib & Hasan, 2017; Kor and Mesko, 2013; Rajgopal et al., 2006) since managers with high ability and power can control crash risk (Park & Jung, 2017). Consequently, boards of directors and stakeholders are more likely to take action to remove the CEO responsible for the crash, thereby signaling their commitment to improved corporate governance practices and risk management protocols.

Secondly, the collapse of a stock price is primarily caused by management's opportunistic behavior in concealing negative news (Jin & Myers, 2006). CEOs can exploit this asymmetry to satisfy their private interests by employing tactics such as earnings management, tax evasion, related party transactions, and non-robust accounting policies (Chen et al., 2017). This behavior contributes to crash risk, which indicates CEO opportunistic behavior (Hutton et al., 2009; Jin & Myers, 2006). As a result, CEOs are more likely to be held accountable for their inability or failure to control crash risk, as their managerial self-interest motivation may be responsible for the stock price crash. Hutton et al. (2009) find that earnings management increases the risk of stock price collapse, and Kim et al. (2011) discover that managers with equity incentives present a higher crash risk. Additionally, third-party "supervisors" such as analysts (Xu et al., 2013), auditors (Robin & Zhang, 2014), and regulatory authorities (Chen et al., 2017; Ding et al., 2020) will be more stringent in detecting and punishing managers' self-interest behavior and reducing crash risk.

A firm's reputation capital is crucial for its long-term success (Xu et al., 2013). According to Park & Jung (2017), a manager's reputation has a positive impact on earnings quality. A higher reputation will translate into value addition for stockholders (Ben-Nasr & Ghouma, 2018), reducing the cost of capital (Beatty & Ritter, 1986), attracting long-term investors, and generating excess returns (Pillai 2011; Austin and Wilson 2017; Hasan et al., 2022). Kotha et al. (2001) demonstrate that Internet firms with better reputations experience higher market value and sales growth. Additionally, Roberts and Dowling (2002) find a positive relationship between a firm's reputation and return on assets (ROA). Furthermore, Fombrun and Shanley (1990) and Shamsie (2003) provide support for a positive relationship between reputation and financial performance.

The stock price crash is a significant negative event that severely damages the company's

reputation (Kreps & Wilson, 1982). Furthermore, reputational damage to a company leads to a decline in stock price (Anderson & Yohn, 2002) and a significant increase in financing costs (Kravet & Shevlin, 2009), as well as the risks of consumer boycotts (Dawar and Pillutla, 2018; Hasan et al., 2022; Barth et al., 2001; Xu et al., 2013). When managers withhold bad news, it can result in reputational damage with long-lasting and profound implications for a firm. Moreover, higher media coverage can increase the reputational and litigation risks for firms, as previously hidden negative news becomes exposed (An et al., 2020; Miller, 2006; Dyck et al., 2010). This exposure may subject managers to higher reputational damages and litigation risks when the misreporting behavior is discovered (Zhang et al., 2021; Dyck et al., 2010; Bushee et al., 2010; An et al., 2020).

Thus, reputation is a valuable asset for CEOs and firms (Alchian & Demsetz, 1975; Ertimur et al., 2012; Suchman, 1995; Westphal & Deephouse, 2011; Karpoff et al., 2009; Sila et al., 2017; Xing et al., 2023). Consequently, firms have strong incentives to build and maintain their reputation (Fang and Yasuda, 2013). In order to salvage the firm's reputation and restore stakeholder confidence, boards of directors often see CEO dismissal as a necessary step.

Thus, reputation is a valuable asset for CEOs and firms, and they have strong incentives to build and maintain their reputation (Fang and Yasuda, 2013; Alchian & Demsetz, 1975; Ertimur et al., 2012). In order to salvage the firm's reputation and restore stakeholder confidence, boards of directors often see CEO dismissal as a necessary step. "Social pressure" and "reputation" are commonly used to penalize and exclude cheaters (Kandori, 1992; McMillan & Woodruff, 2002; Xing et al., 2023). By holding the CEO accountable for the crash, boards send a clear message to stakeholders that the firm acknowledges its weaknesses and is committed to rectifying the situation. Removing the CEO responsible for the crash demonstrates a commitment to strong corporate governance and ethical leadership, reinforcing the perception that the firm is taking decisive action to address the underlying issues. CEO dismissal serves as a symbolic gesture to stakeholders, indicating the firm's dedication to a culture of accountability, transparency, and responsible management. It signals to customers, suppliers, and investors that the firm recognizes the need to rebuild trust and restore its reputation (Suchman, 1995; Westphal & Deephouse, 2011; Karpoff et al., 2009; Sila et al., 2017; Xing et al., 2023).

Stock price crashes have caused significant damage to the firm's value, necessitating the termination of executives to protect shareholders' interests. Crash risk also serves as an indication of an executive's incompetence or opportunistic behavior. In summary, after a company experiences a stock price collapse, the board of directors is likely to dismiss the CEO in order to rebuild shareholders' confidence. Therefore, this paper presents the first research hypothesis.

Hypothesis 1: the higher the crash risk, the higher the possibility of CEO turnover in the future.

3.2 Analyze the impaction of risks on forced CEO turnover

Risk management has been a significant issue since the 2008 financial crisis. Bushman et al. (2010) find that idiosyncratic risk increases CEO turnover and systematic risk reduces it in the United States. Tan and Liu (2016) discover that if CEOs have stronger managerial power, they have the ability to control risks, and the company has lower idiosyncratic volatility. The CEO may be questioned for failing to handle high idiosyncratic risk (Pathan, 2009), and the board of directors has the right to dismiss incompetent CEOs. This paper evaluates the relationship in Chinese circumstances.

In agency theory, ownership (shareholders) and control (management) are separated, leading to information asymmetry between shareholders and managers (Jensen & Meckling, 1976; Ross, 1973). The primary objective of a company is to maximize shareholders' wealth (Ross, 1973; Shleifer & Vishny, 1997). When making risk management strategies, the CEO is the key decision-maker. However, CEOs tend to pursue personal interests at the expense of shareholders' wealth (Jensen & Meckling, 1976). The agency problem is a serious problem that must be controlled. CEO turnover could be an effective way to solve the agency problem (Jensen & Meckling, 1976). Risk information can be acquired and collected from the secondary capital market, which can reflect the efforts of managers. Therefore, we expect risk to be a factor in determining CEO turnover.

One of the important roles of the board is to properly evaluate the CEO's ability and make a decision to fire or retain them. The dismissal of an incompetent CEO is a mechanism to protect shareholders' interests (Jensen & Meckling, 1976). Firm performance is a key indicator in evaluating a CEO's talent, which is significantly affected by volatility. If volatility is primarily driven by factors within the firm and under the CEOs' control, which we call idiosyncratic risk, boards can replace low-talent incumbents. If volatility is unrelated to the CEO's talent and outside their control, which is systematic risk, the board will find it difficult to assess the CEO's talent and make a decision to fire or not. Extensive research documents that poor performance leads to forced CEO turnover. Companies with higher idiosyncratic risks may indicate that the CEO is incompetent to control risks, which the board should consider replacing the unqualified CEO. In this paper, we complement existing literature by investigating the impact of risks on forced CEO turnover.

3.2.1 From the perspective of investment, there are two dimensions to investigate.

According to Datta et al. (2017), firm investment decisions are influenced by their idiosyncratic risk rather than systematic risk. Several studies have found that CEOs are generally risk-averse and are reluctant to undertake risky projects due to potential reputation costs and turnover threats (Bloom & Milkovich, 1998; Chakraborty et al., 2007; Diamond, 1989; Goel & Thakor, 2008; Hirshleifer & Thakor, 1992; Panousi & Papanikolaou, 2012). This negative relationship between idiosyncratic volatility and investment is particularly evident in CEOs who have a risk-averse attitude (Amihud & Lev, 1981; Angeletos, 2007; Guiso & Parigi, 1999; Chen & Petkova,

2010; Knopf et al., 2002; Leahy & Whited, 1996; Bloom et al., 2007; Panousi & Papanikolaou, 2012), as they tend to reduce firm risk to avoid the risk of being fired (Chakraborty, 2007; Peters & Wagner, 2014).

However, some scholars suggest that in cases of poor company performance, boards may encourage excessive risk-taking to maximize value (Boyd & De Nicolo, 2005). In such situations, board pressures may push CEOs to seek higher returns and undertake risky projects to improve performance and secure their position (Zwiebel, 1995). Therefore, CEOs may need to change their risk-averse attitude to a risk-seeking attitude to improve the company's performance (Greve, 2003; John et al., 2008; Subramaniam et al., 2009).

3.2.2 Information quality

The root cause of idiosyncratic risk is the uncertainty of information quality (Brandt et al., 2010; Brown & Kapadia, 2007). Jin and Myers (2006) find that firms with lower information transparency exhibit high idiosyncratic risk. The relationship between information quality and idiosyncratic risk is negative, especially in emerging markets. Chen and Petkova (2010) discover that higher information quality benefits shareholders by reducing uncertainty and information asymmetry, and by enabling the board to accurately evaluate CEOs' talent.

Based on the above analysis, we put forward the second hypothesis:
Hypothesis 2: Idiosyncratic risk increases the likelihood of forced CEO turnover.

As previously mentioned, systematic risk is the risk that the CEO cannot control. Therefore, we put forward the third hypothesis:
Hypothesis 3: The relationship between systematic risk and CEO turnover is unrelated.

3.3 The relationship between CEO turnover and risks in SOE and non-SOE

Different types of ownership have different governance mechanisms and attitudes towards risks. In China, the government plays a significant role in economic affairs and resource allocation, and state-owned enterprises (SOEs) dominate the market (Child & Tse, 2001).

According to Luo et al. (2016), political connections can reduce crash risk in China. In SOEs, CEOs are more likely to pursue careers in government. They have incentives to release bad news at normal times and avoid crash risk events in the near future, thereby safeguarding their political connections.

The goals of State-Owned Enterprises (SOEs) are diverse and include providing public services, ensuring fiscal stability, regulating sectors, and creating employment opportunities. Value maximization is just one of these goals (Wang et al., 2008). Moreover, due to their political connections with the government, SOEs face less risk compared to non-SOEs. They have an

advantage in accessing information that allows them to formulate appropriate strategies, thereby reducing policy uncertainty (Alon et al., 2014; Wang et al., 2008). Additionally, SOEs can easily secure favorable loans and subsidies to mitigate the risk of capital shortages (Haß et al., 2017). Consequently, managers in SOEs face lower risks than those in non-SOEs. Based on these arguments, we propose the fourth and fifth hypotheses:

Therefore, we put forward the fourth and fifth hypotheses:
Hypothesis 4: The relationship between crash risk and CEO turnover is more significant in non-SOE than in SOEs.

Hypothesis 5: The relationship between idiosyncratic risk and CEO turnover is more significant in non-SOE than in SOEs.

4. Sample, Variables, and Descriptive Statistics

4.1 Data sources and sample selection

This paper focuses on Chinese enterprises listed on the Shanghai Stock Exchange (SHSE) and the Shenzhen Stock Exchange (SZSE) between 2010 and 2019, which are used as the initial samples. The sample period begins in 2010 as the financial crisis in 2008 had a significant impact on the stock market. The study uses data from the China Stock Market and Accounting Research Database (CSMAR), except for forced CEO turnover data, which is manually screened from CEO resumes. The following criteria are used to exclude firms: (1) those flagged as ST or *ST, (2) financial services firms due to their industry uniqueness, (3) firms with fewer than 30 trading weeks (Xu et al., 2014), and (4) companies with CEO tenures of less than one year and incomplete information on the key variables (Cao et al., 2017). To avoid outliers, winsorisation is performed at the 1% level in both tails. Additionally, year and industry fixed effects are controlled for. Finally, the study obtains 15,293 firm-year observations.

4.2 Model

When examining the likelihood of forced CEO turnover, the study utilizes the linear probability model (LPM) to evaluate the impact of various risks. Although the LPM may produce fitted values outside the 0 to 1 range, it simplifies the interpretation of coefficients, as mentioned in Wooldridge (2002). Chyz and Gaertner (2017) also suggest that the LPM is appropriate for this study. In the robustness tests presented in Table 10, a logit model is used.

$$Forced\ CEO\ turnover_{i,t} = \alpha_0 + \beta_1 risk_{i,t-1} + \beta_k Controlss_{i,t-1} + I_j + T_{t-1} + \varepsilon_{i,t-1}\ (1)$$

All the variables discussed above are described in Table 3. Additionally, the study controls for

industry (I) and year (T) fixed effects. If the coefficients of β1 are positive and significant, hypotheses 1 and 2 are supported. This indicates that the probability of forced CEO turnover increases with crash risk and idiosyncratic risk.

4.3 Key variables

4.3.1 CEO turnover

The dummy variable TO_FORCE equals 1 for a forced turnover event in year t and 0 otherwise (Cao et al., 2017). TO_FORCE is measured in the t period, while all other variables are measured in the t-1 period (Cao et al., 2017).

There are 3,137 CEO turnover events during the sample period. Table 1 shows 12 reasons for CEO turnover, which are provided by the CSMAR database. Change of job takes up the highest percentage, accounting for 31.94% of total turnover. The second reason is contract expiration, representing 28.91%, and the third is personal reasons (13.01%). Only 0.92% of turnovers fall into the dismissal category. We reclassify reasons for job changes, resignations, personal reasons, and reasons not given (Firth et al., 2006). Other turnovers are classified as normal, with one exception: if the CEO is less than 60 years old and the stated reason is retirement, which is classified as forced.

We can track the destinations of departing CEOs through the resume information provided by CSMAR. For example, the reason for a job change can be divided into force and voluntary turnover. If a departing CEO subsequently holds a position that is better than the previous, we classify it as non-forced (Huson et al., 2004). Table 2 summarizes the reasons for forced and normal turnover and the corresponding frequency. By reexamining 1,836 cases through a search for CEO resumes, we find that 649 cases are not forced. We can see that 417 cases remain as chairman or vice-chairman, and 232 cases are promoted (210 CEOs are promoted as chairman or vice-chairman; 22 CEOs become government officials). We classify the remaining 1,187 cases as forced turnover. These include 243 CEOs who accepted new positions ranked lower than the CEO position and 944 cases without any traceable destination information. In conclusion, 1,898 normal turnover events account for 60.50% of the total turnover, and 1,239 cases of forced turnover (39.50%). Because we investigate the impact of risks on forced CEO turnover, we ignore voluntary turnovers (Chakraborty et al., 2007).

4.3.2 Idiosyncratic risk and systematic risk

According to Bernile et al. (2018), total risk equals the logarithm of the square root of 250 (250 trading days assumed per year) times the company's daily return standard deviation (from equation 2). Idiosyncratic risk can be calculated as the logarithm of the square root of 250 multiplied by the residuals from the market model regression (from equation 4). Systematic risk equals the logarithm of the square root of 250 multiplied by the coefficient from the market model regression (from equation 5) (Ahmad et al., 2021; Ji et al., 2021; Qu et al., 2023; Sila et

al., 2016; Sun et al., 2021).

$$TOTAL\_RISK_{i,t} = ln\left(250 * \sqrt{var(R_{i,d})}\right) \text{ (2)}$$

$$R_{i.d} = \alpha_i + \beta_i R_{m,d} + \varepsilon_{i,t} \text{ (3)}$$

$$IDIOSYNCRATIC\_RISK_{i,t} = ln\left(250 * \sqrt{var(\varepsilon_{i,d})}\right) \text{ (4)}$$

$$SYSTEMATIC\_RISK_{i,t} = ln\left(250 * \sqrt{var(\beta_i)}\right) \text{ (5)}$$

Where $R_{i,d}$ is the daily stock return of stock i on the d day of year t considering the reinvestment of cash dividends, and $R_{m,d}$ is the comprehensive daily market calculated by the weighted average method of total market capitalization considering the reinvestment of cash dividends on the d day of year t response rate.

4.3.3 Crash risk

According to extensive literature, two methods are used to measure crash risk (Andreou et al., 2017; Chen & Ebrahim, 2018; Dumitrescu & Zakriya, 2021; Li & Zeng, 2019). The following measures can be obtained from the CSMAR database.

Firstly, we use the weekly return in the following expanded market model regression.

$$R_{i,j} = \alpha_0 + \beta_1 R_{m,j-2} + \beta_2 R_{m,j-1} + \beta_3 R_{m,j} + \beta_4 R_{m,j+1} + \beta_5 R_{m,j+2} + \varepsilon_{i,j} \text{ (6)}$$

Where $R_{i,j}$ is the return that includes the reinvestment with cash dividends for the firm i in week j. $R_{m,j}$ is the average return of all A-shares weighted by market value week j. The firm-specific weekly return can be obtained in equation (7) (Hutton et al., 2009).

$$w_{i,j} = ln(1 + \varepsilon_{i,j}) \text{ (7)}$$

Then, negative conditional return skewness (NCSKEW) and down-to-up volatility measure (DUVOL) are constructed based on $w_{i,j}$.

$$NSKEW_{i,t} = -\left[n(n-1)^{\frac{3}{2}}\Sigma w_{i,j}^3/\right]/\left[(n-1)(n-2)(\Sigma W_{i,t}^2)^{3/2}\right] \text{ (8)}$$

n represents the number of weekly returns during year t.

Where "up" weeks (n_u) and "down" weeks (n_d) represent the number of weeks that idiosyncratic return $w_{i,j}$ is larger than or smaller than the average annual return $w_{i,t}$.

$$DUVOL_{i,t} = log\left\{\frac{(n_u-1)\sum_{Down} w_{i,j}^2}{n_d-1\sum_{up} w_{i,j}^2}\right\} \quad (9)$$

The higher values of NCSKEW and DUVOL indicate a higher crash risk. The difference is that DUVOL is less likely to be overly influenced by extreme weekly returns (Callen & Fang, 2013).

4.3.4 Control variables

We include the set of control variables in our model, which covers the variables identified in previous accounting studies on executive turnover (Cao et al., 2017; Chyz & Gaertner, 2017; Deng et al., 2019; Guo & Masulis, 2015; Tran et al., 2016). Specifically, we control for the following variables in our model: MB, LEV, ROA, SIZE, TENURE, STATE, FIRMAGE, and DUAL. We also control the industry and year dummy variables. The definitions of these variables are presented in Table 3.

5. Empirical Results

5.1 Descriptive statistics

Table 4 presents descriptive statistics, including the mean, standard deviation, minimum, median, and maximum values of the variables. The mean value of TO_FORCE is 0.039, indicating that forced CEO turnover is relatively low on average. The mean values of TOTAL_RISK, IDIOSYNCTRIC_RISK, and SYSTEMATIC_RISK are 1.918, 1.701, and 5.669, respectively. The average values of NCSKEW and DUVOL are -0.314 and -0.211, respectively, which are generally consistent with the findings of previous studies.

5.2 Correlations

We present the results of the Pearson correlation analysis in Table 5, where Panel B reports the main variables used in this study. Consistent with H1, we find a positive and significant correlation between crash risk indicators (both NCSKEW and DUVOL) and forced CEO turnover. This suggests that crash risk is an important indicator that needs to be considered in CEO evaluation. Moreover, the results indicate positive and significant correlations between total risk and idiosyncratic risk with forced CEO turnover, supporting our hypothesis 2. However, we find no significant relationship between systematic risk and forced CEO turnover, which supports our hypothesis 3.

5.3 Regression results

Table 6 presents the regression results. Columns (1) and (2) show a positive coefficient of 0.009 (0.015) and a significant correlation at 1% between TO_FORCE and crash risk indicators

(NCSKEW & DUVOL), which supports our hypothesis 1. The results for TOTAL_RISK and IDIOSYNCRATIC_RISK in columns (3) and (4) are positive and significant at 1%, which are consistent with our hypothesis 2. On the other hand, systematic risk in column (5) has no impact on forced CEO turnover, supporting our hypothesis 3.

We examine the relationship between forced CEO turnover and various risks in non-SOEs (Table 7) and SOEs (Table 8). The results show that crash risk, total risk, and idiosyncratic risk have a more significant and positive relationship with forced CEO turnover in non-SOEs than in SOEs, supporting our hypotheses 4 and 5.

R-squared realizations are low in Table 6, which suggests limited explanatory power. However, according to Brickley (2003), low R-squared values are common in the literature on executive turnover.

6 Robustness

In this section, we undertake a series of additional tests to ensure the robustness of the results presented in Table 6.

6.1 Falsification tests

According to Chyz and Gaertner (2017), Table 9 reports the falsification tests that support the primary results shown in Table 6. We reassess the main test by replacing the forced CEO replacement with normal CEO turnover (NORMAL). Table 2 identifies 1,898 normal CEO turnover events. Normal CEO departures are unrelated to the deliberate action of the board (Fee et al., 2013), which implies that the relationship between risks and normal CEO turnover is different when compared to forced CEO turnover.

In Table 9, the coefficient between risks and turnover is negative and insignificant, which suggests that risks are not positively associated with unforced turnover. This suggests that the results presented in Table 6 are not spurious.

6.2 The Logit model

In addition to the linear probability model (LPM), we conduct the logit model to test the relationship between various risks and forced CEO turnover. Our findings are consistent with Bushman et al. (2010), which suggests that idiosyncratic risk increases the probability of CEO turnover. Furthermore, we conduct margin effects, and the results remained robust.

7. Conclusions

Following Bushman et al. (2010), this paper also utilizes empirical research methods to analyze the relationship between CEO turnover and risk factors. It aims to shed light on the relevance

of risk management and its impact on CEO turnover decisions. The findings emphasize the critical role of risk management in influencing decisions related to CEO turnover.

Different from Bushman et al. (2010), this paper extends the analysis by specifically examining the impact of crash risks on forced CEO turnover. Crash risk significantly increases the likelihood of forced CEO turnover. We also discover that the total risk and idiosyncratic risk increase the possibility of forced CEO turnover, while the systematic risk does not affect forced CEO turnover. Given the unique context of China as an emerging market, the study recognizes the importance of considering ownership as a separate factor in understanding the relationship between risk and CEO turnover. The study's findings reveal an interesting pattern, indicating that CEOs in non-SOEs demonstrate greater sensitivity to risk factors compared to their counterparts in SOEs. The distinction between SOEs and non-SOEs provides valuable insights into the dynamics of CEO turnover within the Chinese market.

Based on the findings of this study, there are several practical implications for firms and policymakers. Firstly, in terms of risk management practices, firms with higher crash risk should consider implementing more rigorous risk management practices, as indicated by the findings of the study. It is crucial for firms to assess and mitigate potential risks that could lead to adverse financial outcomes, given the positive association between crash risk and forced CEO turnover. This may involve developing robust risk management frameworks, conducting regular risk assessments, and implementing appropriate risk mitigation strategies. Secondly, risks can serve as valuable indicators of a CEO's ability and competence. Firms can leverage risk metrics, such as crash risk and idiosyncratic risk, to assess the CEO's effectiveness in managing potential threats and ensuring the stability of the organization. By incorporating risk indicators into performance evaluation frameworks, firms can gain insights into a CEO's risk management capabilities. Considering that state-owned enterprises (SOEs) and non-SOEs have different risk attitudes and goals, it is necessary to adopt a tailored approach to risk management and CEO evaluation based on the specific ownership structure. Overall, the study emphasizes the significance of risk management and its impact on CEO turnover. Firms and policymakers can benefit from understanding the relationships between various risks and forced CEO turnover, enabling them to adopt proactive measures to enhance risk management practices and ensure effective leadership in navigating potential risks.

8. Contributions

This study makes several contributions to the existing literature on the consequences of firm crash risk and its relationship with CEO turnover.

This study contributes to the existing knowledge on the implications of firm crash risk by providing empirical evidence of a positive association with forced CEO turnover.There are numerous research initiatives aimed at understanding the causes of crash risk, such as corporate governance (Andreou et al., 2016; Hunjra et al., 2020), earnings management (Francis et al.,

2014; Khurana et al., 2018; Li et al., 2022), and managerial ability (Habib & Hasan, 2017; Liu & Lei, 2021), few papers have specifically focused on crash consequences (Habib et al., 2018). This study fills this gap by uncovering a positive relationship between crash risk and CEO turnover. The study utilizes a linear probability model (LPM) and analyzes the Chinese A-share market from 2010 to 2019, establishing that higher crash risk increases the likelihood of CEO turnover. This finding enhances our understanding of the consequences of firm crash risk and emphasizes the importance of considering this risk factor when evaluating CEO performance and stability.

Secondly, the study extends the existing line of research on the factors influencing idiosyncratic risks by exploring how ownership structure moderates the relationship between corporate risk and CEO turnover. Previous studies have examined factors such as the capital market environment, firm performance, and information quality in relation to idiosyncratic risks (Abu-Ghunmi et al., 2015; Chen et al., 2012; Datta et al., 2017; Gerlach et al., 2015; Huang et al., 2014; Mishra., 2020; Rajgopal & Venkatachalam, 2011). However, this study specifically investigates the impact of ownership structure on this relationship (Chen et al., 2012; Fu, 2009; Irvine & Pontiff, 2009; Rajgopal & Venkatachalam, 2011). The findings reveal that idiosyncratic risk has a stronger effect on forced CEO turnover in non-state-owned enterprises (non-SOEs) compared to state-owned enterprises (SOEs). This suggests that the risk attitudes and goals of different ownership types play a role in determining the consequences of idiosyncratic risks on CEO turnover. Thus, this study contributes to the literature by emphasizing the importance of considering ownership structure when analyzing the relationship between corporate risk and CEO turnover.

Thirdly, in the context of China, where state-owned enterprises (SOEs) and non-SOEs operate with different risk attitudes and goals, the study provides valuable insights into how ownership structure influences CEO turnover in the presence of various risks. The findings highlight that crash risk and idiosyncratic risk have distinct impacts on CEO turnover in SOEs and non-SOEs. This emphasizes the importance of considering ownership structure as a differentiating factor when evaluating the implications of risks on CEO turnover. It reinforces the significance of adopting a nuanced approach to understanding the relationship between ownership, risks, and CEO turnover.

The study also contributes to previous research by examining the relationship between ownership structure and CEO turnover (Srivastav et al., 2017; Tsai et al., 2007; Denis et al., 1997; Goyal and Park, 2002). It recognizes the significance of ownership in corporate governance, particularly in the context of emerging markets. For instance, Tsai et al. (2007) find that large family CEOs are less likely to be replaced. Denis et al. (1997) suggest that firms with higher insider ownership typically experience fewer manager-stockholder agency conflicts. Previous literature also suggests that institutional investors possess better skills in assessing CEOs compared to their peers (Admati and Pfleiderer, 2009, Edmans and Manso, 2011).

In summary, this study contributes to the literature by expanding our understanding of the implications of firm crash risk. It investigates the moderating role of ownership structure on the

relationship between corporate risk and CEO turnover, and emphasizes the importance of considering ownership structure when examining the relationship between ownership and CEO turnover.

Table 1 Reasons for CEO turnovers presented in CSMAR database

Reasons	Freq.	Percent	Cum
Change in controlling shareholders	4	0.13%	0.13%
Change of job	1,002	31.94%	32.07%
Completion of acting duties	53	1.69%	33.76%
Contract expiration	907	28.91%	62.67%
Corporate governance reform	144	4.59%	67.26%
Dismissal	29	0.92%	68.19%
Health	55	1.75%	69.94%
Legal disputes	6	0.19%	70.13%
No reason given	182	5.80%	75.93%
Personal reasons	408	13.01%	88.94%
Resignation	244	7.78%	96.72%
Retirement	103	3.28%	100%
Total	3,137	100%	100%

Table 2 Classification of forced and voluntary CEO turnover

Reasons for turnover	Number of observations	Frequency (%)
1.Normal turnover	1898	60.50%
Retirement	80	2.55%
Contract expiration	907	28.91%
Change in controlling shareholders	4	0.13%
Health	55	1.75%
Corporate governance reform	144	4.59%
Legal disputes	6	0.19%
Completion of acting duties	53	1.69%
Remaining as board chairman or vice chairman	417	13.29%
Important government position	22	0.70%
Promoted to board chairman or vice chairman	210	6.69%
2. Forced turnover	1239	39.50%
New position ranked lower than CEO position	243	7.75%
Retirement age less than 60	23	0.73%
Dismissed	29	0.92%
Information unavailable	944	30.09%
Total number of observations	3137	100.00%

Table 3 Variable Definitions

Variables	Notation	Definition
Forced CEO turnover	TO_FORCE	TO_FORCE is a dummy variable that equals 1 when a company has forced CEO turnover and 0 otherwise.
Crash risk variables	NCSKEW	The negative coefficient of skewness. See equation (8) for details.
	DUVOL	The down-to-up volatility. Details are shown in equation (9).
Total risk	TOTAL_RISK	Logarithm of square root of 250 times daily return standard deviation.
Idiosyncratic risk	IDIO_RISK	Logarithm of the square root of 250 multiplied by the residuals from the market model regression (from equation 4).
Systematic risk	SYS_RISK	Logarithm of the square root of 250 multiplied by the coefficient from the market model regression.
Normal CEO turnover	NORMAL	NORMAL is a dummy variable that equals one when a CEO has normal turnover and zero otherwise.
Control variables	SIZE	The natural logarithm of total assets.
	LEV	Total liability scaled by total assets.
	ROA	Net income divided by total assets.
	BM	The book-to-market ratio equals firm's book value of equity divided by market value of equity.
	TENURE	The number of years in a CEO position.
	STATE	STATE is a dummy variable that equals one if the firm is a state-owned enterprise and 0 otherwise.
	DUAL	DUAL equals to one if the CEO also chairs the board of directors and zero otherwise.
	FIRMAGE	The natural logarithm of firm age.

Table 4 Descriptive Statistics

This table presents the descriptive statistics. TO_FORCE is a dummy variable that equals 1 when a company has experienced forced turnover in year t and 0 otherwise. Crash risk is assessed using the NCSKEW and DUVOL measures. For a better understanding of these variables and their definitions, please refer to Table 3.

VARIABLES	NUMBER	MEAN	STANDARD DEVIATION	MINIMUM	MEDIAN	MAXIMUM
SIZE	15293	22.111	1.224	19.631	21.941	26.061
LEV	15293	0.418	0.202	0.057	0.410	0.875
ROA	15293	0.043	0.058	-0.191	0.039	0.210
BM	15293	0.941	0.923	0.100	0.641	5.520
TENURE	15293	5.148	2.626	1.000	4.700	15.281
STATE	15293	0.368	0.482	0.000	0.000	1.000
DUAL	15293	0.273	0.446	0.000	0.000	1.000
FIRMAGE	15293	2.814	0.353	1.609	2.890	3.434
TO FORCE	15293	0.039	0.195	0.000	0.000	1.000
NCSKEW	15293	-0.314	0.714	-2.417	-0.280	1.764
DUVOL	15293	-0.211	0.482	-1.408	-0.214	1.192
TOTAL_RISK	15293	1.918	0.294	1.148	1.907	2.789
IDIO_RISK	15293	1.701	0.318	0.838	1.704	2.632
SYS_RISK	15293	5.669	0.251	4.826	5.699	6.247

Table 5 Correlations

This table presents the results of Pearson correlation analysis between variables used in this paper. The definitions of these variables are provided in Table 3.
Panel B reports the main variables used in the analysis. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A

VARIABLES	SIZE	LEV	ROA	BM	TENURE	STATE	DUAL	FIRMA GE	TO FORCE	NCSKEW	DUVOL	TOTAL RISK	IDIO_ RISK	SYS_ RISK
SIZE	1.00													
LEV	0.49***	1.00												
ROA	-0.01	-0.37***	1.00											
BM	0.64***	0.57***	-0.27***	1.00										
TENURE	0.05***	0.02**	0.04***	0.00	1.00									
STATE	0.35***	0.30***	-0.11***	0.33***	0.05***	1.00								
DUAL	-0.17***	-0.14***	0.04***	-0.15***	0.00	-0.30***	1.00							
FIRMAGE	0.15***	0.15***	-0.09***	0.14***	0.01	0.19***	-0.10***	1.00						
TO FORCE	0.05***	0.06***	-0.07***	0.06***	-0.08***	0.08***	-0.04***	0.01	1.00					
NCSKEW	-0.00	-0.02**	0.03***	-0.02***	0.01*	-0.02***	0.01	-0.00	0.01**	1.00				
DUVOL	-0.01	-0.01	0.02**	-0.01	0.00	-0.01	0.00	0.01	0.02***	0.88***	1.00			
TOTAL RISK	-0.28***	-0.06***	-0.09***	-0.32***	-0.02**	-0.14***	0.08***	-0.07***	0.02**	-0.12***	-0.14***	1.00		
IDIO_RISK	-0.35***	-0.08***	-0.07***	-0.38***	-0.03***	-0.12***	0.10***	-0.07***	0.02**	-0.11***	-0.13***	0.92***	1.00	
SYS_RISK	-0.13***	-0.04***	-0.10***	-0.06***	-0.02**	-0.04***	0.05***	-0.03***	-0.01	-0.10***	-0.09***	0.35***	0.20***	1.00

Panel B

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) TO_FORCE	1					
(2) NCSKEW	0.014**	1				
(3) DUVOL	0.021***	0.881***	1			
(4) TOTAL_RISK	0.015**	-0.120***	-0.144***	1		
(5) IDIO_RISK	0.015***	-0.107***	-0.126***	0.918***	1	
(6) SYS_RISK	-0.006	-0.102***	-0.094***	0.348***	0.197***	1.000

*** p<0.01, ** p<0.05, * p<0.1*

Table 6 The impact of various risks on forced CEO turnover

This table presents the results of our primary tests examining the impact of risks on forced CEO turnover. The regression coefficients are displayed above, while the standard errors are presented below. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. The analysis used OLS (Linear Probability Model) with robust standard errors. For a detailed understanding of the variables used, please refer to Table 3.

	(1) TO_FORCE	(2) TO_FORCE	(3) TO_FORCE	(4) TO_FORCE	(5) TO_FORCE
SIZE	-0.021***	-0.020***	-0.021***	-0.020***	-0.021***
	(-2.813)	(-2.774)	(-2.800)	(-2.764)	(-2.774)
LEV	0.005	0.006	0.003	0.002	0.006
	(0.190)	(0.194)	(0.102)	(0.071)	(0.200)
ROA	-0.266***	-0.265***	-0.268***	-0.270***	-0.265***
	(-3.452)	(-3.436)	(-3.481)	(-3.506)	(-3.438)
BM	0.007	0.007	0.008	0.008	0.007
	(0.958)	(0.910)	(1.119)	(1.108)	(0.883)
TENURE	-0.010***	-0.010***	-0.010***	-0.010***	-0.010***
	(-5.898)	(-5.868)	(-5.900)	(-5.868)	(-5.850)
STATE	0.017	0.017	0.016	0.017	0.016
	(0.581)	(0.592)	(0.572)	(0.593)	(0.574)
DUAL	-0.024**	-0.024**	-0.024**	-0.024**	-0.024**
	(-2.263)	(-2.260)	(-2.251)	(-2.257)	(-2.244)
FIRMAGE	-0.035	-0.036	-0.036	-0.034	-0.035
	(-0.976)	(-0.981)	(-0.975)	(-0.940)	(-0.962)
NCSKEW	0.009***				
	(3.937)				
DUVOL		0.015***			
		(4.264)			
TOTAL_RISK			0.198***		
			(11.591)		
IDIO_RISK				0.132***	
				(10.492)	
SYS_RISK					0.001
					(0.089)
_cons	0.642***	0.639***	0.584**	0.601**	0.636**
	(2.662)	(2.647)	(2.406)	(2.473)	(2.577)
Industry	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
N	15293	15293	15293	15293	15293
adj. R^2	0.011	0.011	0.011	0.011	0.010
F	3.577	3.555	3.583	3.561	3.465

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 7 The impact of various risks on forced CEO turnover in non-SOEs

This table displays the impact of risks on forced CEO turnover in non-SOEs. The regression coefficients are presented above, and the standard errors are reported below. The symbols *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The analysis employed OLS (Linear Probability Model) with robust standard errors. For detailed definitions of the variables used, please refer to Table 3.

	(1) TO_FORCE	(2) TO_FORCE	(3) TO_FORCE	(4) TO_FORCE	(5) TO_FORCE
SIZE	-0.009	-0.008	-0.008	-0.009	-0.008
	(-0.998)	(-0.954)	(-0.975)	(-0.988)	(-0.913)
LEV	-0.002	-0.001	-0.003	-0.005	-0.002
	(-0.055)	(-0.038)	(-0.102)	(-0.146)	(-0.061)
ROA	-0.219**	-0.218**	-0.219**	-0.224**	-0.219**
	(-2.402)	(-2.383)	(-2.403)	(-2.453)	(-2.395)
BM	0.001	0.001	0.002	0.004	0.001
	(0.081)	(0.055)	(0.201)	(0.317)	(0.032)
TENURE	-0.011***	-0.011***	-0.010***	-0.011***	-0.011***
	(-4.183)	(-4.157)	(-3.944)	(-4.083)	(-4.135)
DUAL	-0.038***	-0.037***	-0.037***	-0.037***	-0.037***
	(-2.954)	(-2.950)	(-2.924)	(-2.930)	(-2.940)
FIRMAGE	-0.008	-0.009	-0.009	-0.007	-0.008
	(-0.204)	(-0.224)	(-0.222)	(-0.158)	(-0.184)
NCSKEW	0.014***				
	(3.691)				
DUVOL		0.020***			
		(3.844)			
TOTAL_RISK			0.041*		
			(1.897)		
IDIO_RISK				0.040**	
				(2.241)	
SYS_RISK					-0.005
					(-0.335)
_cons	-0.062	-0.063	-0.124	-0.115	-0.056
	(-0.260)	(-0.264)	(-0.503)	(-0.472)	(-0.226)
Industry	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
N	9462	9462	9462	9462	9462
adj. R^2	0.015	0.015	0.013	0.014	0.013

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 8 The impact of various risks on forced CEO turnover in SOEs

This table presents the impact of risks on forced CEO turnover in SOEs. The regression coefficients are presented above, and the standard errors are reported below. The symbols *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The analysis employed OLS (Linear Probability Model) with robust standard errors. For detailed definitions of the variables used, please refer to Table 3.

	(1) TO_FORCE	(2) TO_FORCE	(3) TO_FORCE	(4) TO_FORCE	(5) TO_FORCE
SIZE	-0.030*	-0.030*	-0.030*	-0.030*	-0.031*
	(-1.923)	(-1.929)	(-1.930)	(-1.909)	(-1.938)
LEV	-0.003	-0.003	-0.008	-0.006	-0.003
	(-0.058)	(-0.057)	(-0.127)	(-0.104)	(-0.058)
ROA	-0.321**	-0.321**	-0.328**	-0.323**	-0.324**
	(-2.306)	(-2.304)	(-2.360)	(-2.324)	(-2.327)
BM	0.008	0.008	0.009	0.009	0.008
	(0.812)	(0.803)	(0.920)	(0.848)	(0.823)
TENURE	-0.009***	-0.009***	-0.009***	-0.009***	-0.009***
	(-3.798)	(-3.791)	(-3.779)	(-3.796)	(-3.762)
DUAL	0.013	0.013	0.013	0.013	0.013
	(0.673)	(0.676)	(0.651)	(0.665)	(0.667)
FIRMAGE	-0.005	-0.004	-0.008	-0.007	-0.005
	(-0.061)	(-0.055)	(-0.101)	(-0.082)	(-0.057)
NCSKEW	0.002				
	(0.228)				
DUVOL		0.001			
		(0.142)			
TOTAL_RISK			0.037		
			(0.962)		
IDIO_RISK				0.013	
				(0.449)	
SYS_RISK					0.012
					(0.505)
_cons	1.035**	1.037**	0.995**	1.022**	0.985**
	(2.485)	(2.487)	(2.401)	(2.451)	(2.342)
Industry	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
N	5831	5831	5831	5831	5831
adj. R^2	0.013	0.013	0.013	0.013	0.013

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 9 Falsification Tests

This table tests the relationship between various risks and normal CEO turnover (NORMAL). Statistical significance levels are denoted by *, **, and ***, indicating 10%, 5%, and 1% significance levels, respectively. For detailed definitions of the variables used, please refer to Table 3.

	(1) NORMAL	(2) NORMAL	(3) NORMAL	(4) NORMAL	(5) NORMAL
SIZE	0.009	0.010	0.0097	0.010	0.010
	(1.037)	(1.015)	(1.026)	(1.018)	(1.046)
LEV	0.001	0.001	0.001	0.001	-0.001
	(0.012)	(0.010)	(0.018)	(0.038)	(-0.002)
ROA	-0.229***	-0.230***	-0.229***	-0.228***	-0.230***
	(-2.755)	(-2.765)	(-2.758)	(-2.745)	(-2.767)
BM	-0.006	-0.005	-0.005	-0.006	-0.005
	(-0.760)	(-0.726)	(-0.739)	(-0.777)	(-0.715)
TENURE	0.001	0.001	0.001	0.001	0.001
	(0.093)	(0.090)	(0.085)	(0.085)	(0.085)
STATE	0.029	0.029	0.029	0.029	0.029
	(0.791)	(0.786)	(0.795)	(0.791)	(0.801)
DUAL	-0.071***	-0.071***	-0.071***	-0.071***	-0.071***
	(-8.983)	(-8.978)	(-8.983)	(-8.980)	(-8.984)
FIRMAGE	-0.006	-0.006	-0.006	-0.007	-0.006
	(-0.143)	(-0.140)	(-0.149)	(-0.156)	(-0.135)
NCSKEW	-0.007				
	(-1.603)				
DUVOL		-0.009			
		(-1.382)			
TOTAL_RISK			-0.006		
			(-0.211)		
IDIO_RISK				-0.009	
				(-0.416)	
SYS_RISK					-0.006
					(-0.431)
_cons	-0.400*	-0.397*	-0.391*	-0.387*	-0.371
	(-1.734)	(-1.724)	(-1.657)	(-1.658)	(-1.516)
Industry	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
N	15293	15293	15293	15293	15293
adj. R^2	0.015	0.015	0.015	0.015	0.015
F	14.195	14.471	16.033	15.554	15.787

Table 10 Robustness tests

The table displays robustness tests, which examine the effect of taxes on forced CEO turnover using logit model and margin effects. Forced CEO Turnover is measured in the t period, while all other variables are measured in the t-1 period. Group (1) using Logit model verify the hypothesis in full samples, (2) using Logit model in non-SOEs and (3) using Logit model in SOEs. Group (4) estimates the marginal effects in full sample, (5) estimates the marginal effects in non-SOEs, and (6) estimates the marginal effects in SOEs. Statistical significance levels are denoted by *, **, and ***, indicating 10%, 5%, and 1% significance levels, respectively. For detailed definitions of the variables used, please refer to Table 3.

ROBUSTNESS TESTS	NCSKEW	DUVOL	IDIO_RISK	SYS_RISK
(1) LOGIT MODEL WITH FULL SAMPLE	0.163***	0.253***	0.397***	0.224
	(3.243)	(3.449)	(1.087)	(1.491)
(2) LOGIT MODEL WITH NON-SOEs	0.310***	0.482***	0.929***	0.165
	(4.287)	(4.538)	(2.522)	(0.412)
(3) LOGIT MODEL WITH SOEs	0.008	0.016	0.115	0.020
	(0.117)	(0.154)	(0.370)	(0.090)
(4) MARGIN EFFECTS WITH FULL SAMPLE	0.017***	0.030***	0.061***	0.003
	(5.378)	(6.507)	(8.208)	(0.377)
(5) MARGIN EFFECTS WITH NON-SOEs	0.024***	0.043***	0.089***	0.007
	(6.533)	(8.025)	(9.965)	(0.754)
(6) MARGIN EFFECTS WITH SOEs	0.004	0.007	0.008	0.003
	(0.723)	(0.794)	(0.594)	(0.209)

t statistics in parentheses
* p < 0.1, ** p < 0.05, *** p < 0.01

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Chapter 3: The Impact of Comment Letters on Forced CEO Turnover

Abstract:

The stock exchange uses comment letters to monitor listed companies. This study examines the impact of comment letters on forced CEO turnover using the LPM approach from 2015 to 2020. The findings from this study indicate a significant positive relationship between comment letters and forced CEO turnover, which supports the notion that comment letters play a "supervision role" in CEO turnover. In addition, the study reveals that high marketisation regions amplify the "supervision effect" of comment letters on forced CEO turnover. This paper contributes to the literature on the oversight of comment letters, which enhances corporate governance. It also verifies the efficiency of the principle of public law enforcement and tests it in the emerging market.

Keywords: comment letters; CEO turnover; corporate governance

1. Introduction

Comment letters as a public enforcement tool are efficient in supervision of corporations (Djankov et al., 2003; Christensen, 2016; Myers et al., 2013; Bens et al., 2016; Kubick et al., 2016; Johnston & Petacchi, 2017; Li and Liu, 2017; Bozanic et al., 2017; Brown et al., 2018; Ryans, 2020). This is particularly important in non-U.S. markets, especially emerging markets, where investor rights protection is poor, ownership structures are highly concentrated, and information intermediaries and financial reporting practices are often opaque (Dyck et al., 2010). However, the efficiency of comment letters in China has yet to be explored.

Comment letters are useful in identifying deficiencies in corporate governance, poor disclosure quality, and potential violations of laws and regulations, which may lead to serious public enforcement actions (Duro et al., 2019; Ryans, 2020). Companies that receive comment letters may be perceived as having weak corporate governance or poor disclosure quality. Therefore, public enforcement is indispensable in overseeing company disclosure and corporate governance (Christensen, 2016).

The CEO is the ultimate person who takes full responsibility for corporate operations. Therefore, this paper examines the impact of Chinese comment letters on forced CEO turnover from various perspectives. We find that comment letters expose incompetent or dishonest managers, damage their and the firms' reputations, and cause higher management turnover. Due to the different nature of SOEs and non-SOEs, we also discover that CEOs are unlikely to be fired in SOEs. As China has many provinces and different levels of marketization, we find that in regions with a higher degree of marketization, the external regulatory environment is better. Comment letters are more likely to play a regulatory role, leading to forced CEO turnover. Finally, the study uses text mining to analyze the relationship between CEO turnover and comment letters and conducts a series of robustness tests to verify the results.

This study extends the work of Yang (2021), who examines the severity of the receipt of Chinese comment letters. Firstly, this paper considers the impact of different degrees of marketization. In addition, this paper conducts a more comprehensive analysis of comment letters than Yang (2021), who uses words and days to measure severity. This paper analyzes the impact of the tone and word frequency of comment letters on forced CEO turnover.

The rest of this paper is organized as follows. Section 2 introduces the institutional background, literature review, and hypothesis development. Section 3 presents the data, variables, and models. Section 4 reports the empirical results. Section 5 shows the robustness tests. Finally, Section 6 concludes the paper.

2. Institutional Background

According to Section 408 of the Sarbanes-Oxley Act of 2002 (SOX), the Securities and Exchange Commission (SEC) is required to review companies' filings once every three years to ensure that they comply with SEC and Generally Accepted Accounting Principles (GAAP) standards (Ryans et al., 2015). To enhance transparency, the SEC has published comment letters since 2005, and companies must respond within 45 days. In 2014, disclosure time was reduced to 20 days (Ryans et al., 2015).

If a financial report violates GAAP standards or if the disclosure is incomplete and requires further clarification, the SEC may issue a comment letter to the company and request a response (Bozanic et al., 2017; Myers et al., 2013). The "dialogue" between the SEC and the company may be repeated several times until the issue is resolved. This process allows investors to access pertinent information and prevent fraud and manipulation. If the issues remain unresolved, the review may conclude with the company making a restated financial report (Myers et al., 2013).

2.1 Regulatory bodies in China

The China Securities Regulatory Commission (CSRC) is the primary securities authority in China and was established in 1992. The main responsibility of the CSRC is to discover illegal activities and impose penalties. In addition, the CSRC also controls the two stock exchanges (Shanghai Stock Exchange and Shenzhen Stock Exchange). The functions of the CSRC are similar to those of the US Securities and Exchange Commission (SEC). However, unlike the US SEC, the CSRC is not an independent authority. It is directly subordinate to the State Council (the Chinese highest decision-making institute) and has no judicial power. The Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZSE) implemented the "Express Train of Information Disclosure" for all listed companies in 2014 and 2015, respectively. Since 2015, comment letters have been issued frequently and have gradually become an effective tool for CSRC supervision. Figure 1 depicts 9,666 comment letters issued between 2015-2020, with an upward trend (Duan et al., 2019; Yang, 2021).

The Chinese comment letter system has three distinct characteristics. Firstly, unlike in the United States where reviews are conducted once every three years, annual reports are examined every year. Secondly, although the SSE and SZSE are not administrative departments, they have close links with the CSRC and operate under its supervision, usually regarded as extensions of the CSRC. The CSRC employs comment letters as a means of regulatory oversight of listed companies, largely delegating the oversight of CLs to the stock exchange. Chen et al. (2018) find that nearly 96% of comment letters are from the stock exchange. Finally, comment letters may be followed by investigations and penalties, which increase regulatory risk for companies receiving them.

Comment letters mainly focus on financial reports, related party transactions, asset restructuring, media reports, provision of guarantees and other matters. Comment letters are divided into five categories: accounting standards, mergers and acquisitions, non-standard disclosure, internal control and risk assessment, and securities laws and regulations. The CSRC mandates companies to respond within a specified period to reduce information asymmetry and improve the quality of disclosure.

2.2 Institution background in China

According to the "Implementation Measures for Self-regulation and Disciplinary Actions of Shenzhen Stock Exchange (Revised in 2018)" and the "Business Guidelines for Shenzhen Stock Exchange's Direct Access to Listed Company Information Disclosure," listed companies will receive comment letters issued by the exchange if they have incomplete or false information disclosure behavior. The regulatory classification of the letters mainly includes attention letters, comment letters and regulatory letters. From the perspective of the inquiry content, these types of inquiry letters have different focuses and severity levels. In terms of form, both comment letters and regulatory letters are written documents issued by the stock exchange, with listed companies as the main recipients and the behavior of listed companies as the content of the letters. However, in terms of substance, there are significant differences in the nature, purpose, and content between comment letters and regulatory letters.

Attention letters belong to the category of comment letters, and they express concerns and prompt supervision on relevant issues. They hope that listed companies will provide responses regarding the relevant issues, with the purpose of providing reminders. Attention letters are usually issued during the suspension of trading for listed company restructuring, to remind and urge the listed companies to complete the restructuring work as soon as possible.

Comment letters are usually publicly sent in the form of announcements. They require listed companies to provide clear answers, explanations, including defenses, and rectify the issues raised. Comment letters are not part of the self-regulatory measures or disciplinary actions of the stock exchange but serve as an investigative tool before implementing self-regulatory measures or disciplinary actions. Their purpose is to investigate, but they also have a role in prompting and reminding, serving as an effective flexible constraint mechanism. The types of

comment letters issued by the exchange mainly include comment letters on permitted restructuring, comment letters on non-permitted restructuring, annual report comment letters, attention letters, and others.

Regulatory letters are written warnings issued by the stock exchange to listed companies, related individuals, sponsoring institutions, and other participants in the securities market for their violations. They are one of the self-regulatory measures of the Shanghai and Shenzhen Stock Exchanges. When the stock exchange issues a regulatory letter, it means that the behavior of certain participants in the securities market has violated the "provisions of the Securities Law", "Stock Listing Rules", and other laws and regulations. The stock exchange issues regulatory letters to warn them, and listed companies and other entities need to rectify or remedy the situation in accordance with the provisions of laws and regulations and hold responsible individuals accountable.

In summary, comment letters and attention letters both fall within the scope of inquiry letters, indicating the exchange's concerns regarding significant information disclosed by companies or issues identified during the review of relevant documents submitted by listed companies. They serve as a warning and prompt listed companies to provide responses. Regulatory letters are a regulatory measure and are the most severe among the three types of letters. They are only issued when listed companies violate relevant information disclosure regulations.

The interaction between the stock exchange and listed companies regarding information content improves the transparency of relevant information, enabling investors to timely access information and reduce decision-making errors and investment losses caused by information asymmetry. Therefore, in this sense, the exchange's routine supervision plays a preventive role in preventing the spread of violations in company information disclosure and mitigating information risks for investors.

3. Literature Review

3.1 Research on comment letters

A comment letter, unlike corporate governance, is a government-driven mandatory external enforcement mechanism that plays an irreplaceable role in supervision (Yang, 2021). The CSRC is the primary supervisor and regulator of securities markets. Issuing comment letters has become an effective means of supervision since 2015 (Kubic, 2017). Related research on comment letters has focused on their determinants and consequences.

Comment letters are influenced by many factors. For instance, companies that have lower profitability and higher business complexity, as well as companies that are audited by small firms or have poor internal governance, are more likely to be sent comment letters (Myers et al., 2013). The purpose of the comment letter is to point out deficiencies in financial disclosures (Bozanic et al., 2017; Myers et al., 2013). In general, receiving a comment letter means poor

quality of information disclosure that requires correction (Boone et al., 2013; Gietzmann & Pettinicchio, 2013; Rosati et al., 2019). Correia (2014) shows that companies with political connections are unlikely to restate financial statement and have lower economic penalties when given a comment letter. On the other hand, Heese et al. (2017) find that companies with political relations are more likely to receive comment letters, while Johnston and Petacchi (2017) find that companies with a restated history, an unstable business environment, non- "big four" audit firms' clients, or an abnormal P/E ratio are more likely to receive comment letters. Cassell et al. (2019) demonstrate that if the readability of the response is low, the company is more likely to restate the financial report. Additionally, Do and Zhang (2018) find that female staff at the SEC are generally tough reviewers.

The consequences of comment letters can be summarized as decreasing information asymmetry, improving information quality (Bozanic et al., 2017), cutting down managers' opportunistic activities (Cassell et al., 2019), and increasing Chief Financial Officer (CFO) turnover (Gietzmann et al., 2015).

Public enforcement of law recommends that government agencies investigate and sanction individuals or entities that violate the provisions of the law (Becker, 1968). As a regulator, the stock exchange actively monitors, judges, and evaluates whether there are potential violations through regular evaluation and contact with listed companies (OECD, 2014). The stock exchange can use "soft" methods, including enhanced information requests, reprimand letters, and comment letters. Public enforcement of law suggests that public enforcement in capital markets is necessary, which reduces information asymmetries and improves the information environment and quality (Djankov et al., 2003; Porta et al., 2008). Comment letters provide additional information to market participants, which enhances the disclosure of potential adverse prospects (Haapamäki, 2021; Skomra et al., 2022). Comment letters also reduce information asymmetry between managers and investors through the review process of the comment letter and further improve information quality (Bozanic et al., 2017; Johnston & Petacchi, 2017; Brown et al., 2018; Gibson, 2003; Ryans et al., 2015). Duro et al. (2019) discover that companies provide more information after receiving comment letters. Lawrence et al. (2010) find that the CL process can identify material misstatements. Additionally, Bens et al. (2016) state that after receiving comment letters from the stock exchange, enterprises enhance information transparency and decrease estimation uncertainty. Therefore, comment letters play a significant role in external supervision.

Comment letters can also be used to discipline company conduct (Brown et al., 2018). The consequences of authority inspection on a corporation's behavior are well-documented in prior literature. For instance, the decrease in tax avoidance after a company receives a comment letter (Bozanic et al., 2017; Ryans et al., 2015). Kubick et al. (2016) discover that businesses that participate in more tax avoidance activities are more likely to receive comment letters, and companies will reduce their tax avoidance actions after receiving such letters. Comment letters also reduce litigation risk (Cunningham et al., 2020). Bozanic et al. (2017) discover that litigation risks decrease when a corporation implements corrective actions in response to a comment letter. Johnston and Petacchi (2017) find that comment letters reduce the stock bid-

ask spread, while Cui and Zhang (2019) discover a negative relationship between comment letters and future stock price crash risk. Comment letters also limit management's opportunistic actions (Li & Liu, 2017). Cunningham et al. (2020) discover a statistically significant inverse relationship between comment letters and earnings management. Gietzmann et al. (2015) show that the CEO may be fired when the number of comment letters increases.

Comment letters also have a "spillover effect". The comment letter impacts not just the quality of the company's report, but also the quality of its industry peers' reports (Kubick & Lockhart, 2016). Brown et al. (2018) find that, if the industry leader has received a comment letter, other companies provide more information in the subsequent year to reduce the likelihood of receiving comment letters. Furthermore, Gleason et al. (2007) find that when a company receives a comment letter and needs to restate, it will affect the value of other companies in the same industry. Therefore, CLs improve information environments through the spillover effect and play a crucial role in external supervision (Brown et al., 2018).

3.2 Literature review on CEO turnover

CEO turnover is a significant event in corporate governance that has received increasing attention from academics. Previous studies have identified various factors that influence CEO turnover, including company performance, property rights, political connections, information transparency, accounting fraud, and violations (Aghamolla & Hashimoto, 2021; Cheng et al., 2020; Dragota et al., 2020; Jarva et al., 2019; Jenter & Lewellen, 2021; Kim et al., 2020; Lin et al., 2020; Sivapregasam et al., 2020; Suk et al., 2021). There is a conflict of interest between managers and shareholders that leads to agency costs, and CEO turnover is an efficient way to punish managers.

This paper examines CEO turnover from the perspective of listed companies that are questioned by regulators. When a listed company receives a comment letter, it indicates that the company has issues with information disclosure, corporate governance, or investment matters. This attracts the attention of investors, auditors, the media, regulators, and other stakeholders, which may result in more severe regulatory penalties in the future. In this context, the CEO may be used as a scapegoat to rebuild the company's reputation. Gietzmann et al. (2015) find a significantly positive association between comment letters and CFO turnover. In China, the CSRC sent a comment letter to ZHANGZIDAO GROUP Company due to the risk of going concern and fraud, which ultimately led to the firing of the CEO in 2019.

As an enterprise leader, the CEO plays a dominant role in decision-making. CEO turnover can be used to evaluate the effectiveness of the board (Huson et al., 2001). Combs et al. (2007) show that independent directors are more likely to dismiss the CEO due to poor firm performance.

Three main areas related to CEO turnover are identified: company performance, board structure, and corporate governance. Shen and Cannella (2002) suggest that CEO turnover has a long-

term and short-term impact on the company's performance, capital structure, and future strategy. It is therefore crucial for companies to carefully consider the factors that may lead to CEO turnover and implement effective corporate governance.

3.2.1 Influencing factors on CEO turnover

Corporate Governance

The principal-agent problem arises due to the separation of ownership and control. Efficient corporate governance can assess a CEO's performance, replace ineffective CEOs, and recommend suitable successors (He et al., 2016).

Corporate Performance

Many studies have analyzed the relationship between CEO turnover and corporate performance (Jenter & Kanaan, 2015). Kato and Long (2006) discover that the negative correlation between CEO turnover and corporate performance in state-owned enterprises is weaker than in non-SOEs. Moreover, when the CEO is one of the controlling shareholders, he is unlikely to be dismissed due to performance. Rachpradit et al. (2012) also find that the likelihood of CEO turnover is low when the company is family controlled.

Board Structure

The primary responsibility of the board is to hire, dismiss, supervise, and compensate managers (Rutherford & Lozano, 2018; Brickley, 2003; Stein & Zhao, 2019; Wiersema & Zhang, 2013). Flickinger et al. (2016) discover that the number of external directors plays a significant role in the decision to dismiss a CEO.

Previous studies have divided CEO turnover into two categories: voluntary and forced (Denis et al., 1997; Kang & Shivdasani, 1995; Maury, 2006). Adams et al. (2010) define voluntary turnover as death, illness, merger, and takeover. It is difficult to identify forced turnover as it is often not disclosed publicly or covered by the corporate (Weisbach, 1988). This paper follows Cao et al. (2017) in distinguishing forced and voluntary CEO turnover. They analyze the relationship between political connections and CEO turnover in a Chinese context.

3.2.2 Consequences of CEO turnover

CEO turnover has a different influence on market reactions (Aupperle et al., 1985; Dahya et al., 2002; Denis et al., 1997; Shen et al., 2010; Weisbach, 1988). Huson et al. (2004) shows that companies who announce a CEO turnover face higher abnormal stock return. He also finds that firms that undergo CEO turnover also experience significant performance improvement, which suggests that shareholders view turnover as good news. Concerning personal career and reputation, CEOs tend to reduce opportunistic behaviours and improve the quality of financial reports after receiving comment letters (Desai et al., 2006; Fahlenbrach et al., 2008; Hillman et al., 2009; Hribar & Jenkins, 2004; Karpoff et al., 2008; Kravet & Shevlin, 2009; Palmrose et al., 2004; Sila et al., 2016). Bernard et al. (2016) discover that corporate social performance

(CSP) improves after CEO turnover.

4. Research Theory

This paper aims to provide theoretical support for the development of hypotheses by introducing four important theories: information asymmetry theory, agency theory, efficient market theory, and stakeholder theory. The following sections provide an in-depth discussion of these theories and their relevance to corporate governance and external supervision.

4.1 Information asymmetry theory

The information asymmetry theory was put forward by James A. Mirrlees and William Vickrey in 1966, who highlighted the issue of information asymmetry in enterprises (Lofgren et al., 2008). Managers control more valuable information than shareholders through daily operations and management, which leads to information asymmetry. In order to pursue their private interests, management may infringe on shareholder interests. External parties, such as shareholders, creditors, and potential investors, receive less information because they do not participate directly in the operation of the company. Their understanding of business activities is limited to passive access through financial reports. Therefore, the quantity and quality of information are particularly important for external decision-makers. Furthermore, due to the professionalism and complexity of information, it is difficult for stakeholders to evaluate its quality accurately. Additionally, listed companies tend to disclose positive information, hide negative information, or choose to postpone disclosure. Asymmetric information can be reduced by obtaining more information from external third parties, regulatory authorities, and financial media. Therefore, external governance was established to alleviate information asymmetry problems, with auditors, the media, securities analysts, and regulatory parties playing an essential role in supervision. The stock exchange can reveal possible problems of the listed company by issuing a comment letter, thereby decreasing information asymmetry and improving transparency.

4.2 Agency theory

Agency theory, put forward by Jensen and Meckling (1976), indicates an agency relationship between shareholders and managers resulting from the separation of ownership and control, and serves as the theoretical basis of corporate governance. Shareholders aim to pursue higher corporate profits and maximize enterprise value, while managers seek higher salaries, on-the-job consumption, and reputation. Due to shareholders' lack of understanding of enterprise management, agents may engage in speculative behavior for private interests, which may damage shareholders' interests. The agency problem, therefore, is significant and can be alleviated through incentives and supervision. Shareholders can restrict managers' speculative behavior by establishing effective incentive mechanisms, such as equity and salary incentives, to align their objectives (Bathala & Rao, 1995; Dharwadkar et al., 2000; Lan & Heracleous, 2010). Supervision can also be used to monitor and restrict managers' behavior. Lack of

oversight enables managers to make decisions contrary to shareholders' interests, while the stock exchange can identify opportunistic behavior of management. Issuance of comment letters makes opportunistic behavior public, leading to termination of an incapable or immoral CEO, which has an external regulatory effect and reduces principal-agent costs (Panda & Leepsa, 2017).

4.3 Efficient market theory

In 1970, Fama proposed the efficient market hypothesis, which posits that the stock prices in an efficient market reflect all the available information and adjust rapidly to new information. The effectiveness of the market means that stock prices can rapidly adjust to reflect all available information. Fama (1970) identified three forms of market efficiency: weak, semi-strong, and strong. In the weak form, stock prices reflect only historical information and investors can gain excess returns through public and insider information. The semi-strong form includes historical and public information, and a few investors with insider information can earn excess returns. The strong form reflects all relevant information, and no one can gain excess returns. Although the social credit system has not been established, industrial monopolies still exist, and the legal system is incomplete in China, the comment letter has played an irreplaceable role in external supervision.

4.4 Stakeholder theory

Stakeholder theory emphasizes that many entities affect companies, including employees, customers, suppliers, financiers, communities, governmental bodies, political groups, and creditors. Compliance with laws and regulations is crucial for obtaining legitimacy, and managers have a fiduciary duty to stakeholders. Reputation can also increase stakeholders' identification by positively influencing their perceptions. The disclosure of defects in corporate governance and internal control through comment letters can affect stakeholders' perceptions and lead to external pressure on the company (Jones et al., 2000).

5. Hypothesis Development

Comment letters and CEO turnover
After exploring prior studies that analyze the determinants of receiving comment letters, it can be summarized that comment letters are the main channel for uncovering disclosure deficiencies, weak tax compliance, poor corporate governance, and weak internal control and misstatement (Boone et al., 2013; Cassell et al., 2011; Cunningham et al., 2016; Heese et al., 2017; Johnston & Petacchi, 2017; Kubick & Lockhart, 2016; Li & Liu, 2017). Therefore, according to prior studies that analyze the determinants of receiving comment letters, it can be summarized that comment letters are a negative signal to the public and lead to a negative stock market reaction (Ryans et al., 2015). As a result of damaging the credibility of a company's information, comment letters weaken the trust between the public and managers. In addition,

companies' legitimacy can be damaged when they fail to comply with relevant regulations (Cassell et al., 2019; Gietzmann et al., 2015; Gietzmann & Pettinicchio, 2013). In today's interconnected and transparent business environment, maintaining a positive public image is crucial. Firms might view the CEO's inability to address the issues raised in comment letters as a failure to lead effectively, leading to a loss of trust among stakeholders, including investors, customers, and employees(Gow et al., 2018; Kubick et al., 2016). The revelation of poor financial reporting quality has detrimental effects on the reputations of firms and their managers (Desai et al., 2006; Cao et al., 2014;). In emerging markets, regulators can employ public opinion pressure as a means to curtail controlling shareholders from misappropriating resources (Dyck et al., 2010). Hence, when regulators publicly shame firms, controlling shareholders, and managers through comment letters, particularly those with a harsh tone, firms may face immense pressure to restore their tarnished reputations by replacing the CEO.

External stakeholders (the media, investors, intermediaries and regulators) pay more attention to comment letters, which may trigger restatements, stricter investigation and enforcement (Anderson & Yohn, 2002; Hennes et al., 2011; Hennes et al., 2014; Liu & Moffitt, 2016; Loughran & McDonald, 2011a). Institutional investors also tend to reduce their shareholdings when a company receives comment letters, which indicates that institutional investors view comment letters as a negative event (Gietzmann & Pettinicchio, 2013). Additionally, banks raise their loan interest rates for companies that have received a comment letter (Cunningham et al., 2016). Investors may therefore view the financial reports as low quality or unreliable (Do & Zhang, 2018). The comment letters also lead to an increase in audit risk and litigation risk, which causes the external auditor to raise audit fees (Antle et al., 2006; DeFond & Zhang, 2014; DeFond et al., 2002; Karpoff et al., 2012). Furthermore, the media plays a significant role in the information dissemination and supervision of a business (Robinson et al., 2011). Dyck et al. (2010) suggest that there are various ways in which the media can influence corporates. First, media reports influence public opinion, which, in turn, attracts regulators' attention and prompts further enforcement (Engelberg & Parsons, 2011; Robinson et al., 2011). Furthermore, the media has a reputation mechanism, whereby the media report affects the reputation of the company and managers, which can control and regulate managers' behavior to some extent (Tetlock, 2010). Comment letters can serve as crucial evidence for enforcing securities laws. Stock exchanges have the authority to issue warnings to firms, executives, and board members based on the evidence collected in these letters. In more severe cases, disciplinary actions may be taken, including public criticism, condemnation, or declaring individuals unfit for work in public firms. If potential law violations are suspected, stock exchanges can request on-site inspections by regional offices of the China Securities Regulatory Commission (CSRC) or report evidence to the CSRC's head office, initiating further investigations. therefore, is expected that recipients of comment letters are more likely to face regulatory consequences compared to non-recipients. Moreover, recipients of many comment letters in a year are anticipated to be at a higher risk of facing such consequences compared to those who receive less comment letters.

Firing an incompetent CEO is an effective measure to restore public confidence (Cowen & Marcel, 2011; Johnson & Busemeyer, 2010; Gunny & Hermis, 2019). First, the Administrative

Measures on Information Disclosure by Listed Companies in China require that executives are ultimately responsible for the quality of information disclosed. Therefore, blaming all of the mistakes on executives is a simple and feasible way for a company to recover from a bad reputation and potential litigation risks, which is supported by numerous studies (Agarwal et al., 2014; Agrawal & Chadha, 2005; Agrawal et al., 1999; Bird et al., 2015; Chakravarthy et al., 2014; Chyz & Gaertner, 2017; Fich & Shivdasani, 2007; Gilson, 1989; Gow et al., 2018; Healy & Palepu, 2001; Helland, 2006; Hutton et al., 2011; Lel et al., 2014; Srinivasan, 2005). Gietzmann et al. (2015) discover that there is an increase in manager turnover when companies receive a highly intense comment letter. By dismissing a CEO, a company can show that they are taking comment letters seriously by taking appropriate and practical action, which sends a positive signal to the public and rebuilds trust (Eckbo et al., 2016). Furthermore, CEO turnover can separate the company from events that undermine its legitimacy and reshape its corporate reputation (Arthaud-Day et al., 2006; Boone et al., 2013; Chen & Hambrick, 2012; Cheng & Farber, 2008). This also indicates that the company has an effective corporate governance system to supervise and regulate the CEO (Harvey et al., 2018). And the board of directors has a fiduciary duty to oversee the CEO's performance and ensure the company's long-term success. If comment letters indicate persistent issues that are not adequately addressed, the board may see it as a failure of the CEO's leadership and decide to take action to protect the interests of shareholders and the company. Furthermore, even if comment letters do not impose direct penalties, they often serve as a formal documentation of concerns or violations. Firms may view the existence of multiple compliant comment letters as evidence of the CEO's inability to rectify problems or adapt to changing circumstances. In this context, terminating the CEO can be seen as a means of enforcing accountability and ensuring that there are consequences for perceived shortcomings.

In conclusion, the comment letter reduces the expectations and trust of stakeholders in the company, thereby jeopardizing its legitimacy and corporate reputation (Freeman & Dmytriyev, 2017). CEOs are ultimately responsible for the information disclosure of a company.

Therefore, we put forward the first hypothesis.
H1: Comment letters increase forced CEO turnover.

SOEs and non-SOEs
Considering the influential factors and economic consequences of administrative punishment, corporate ownership is a significant factor that should be considered. And it is critical to distinguish between SOEs and non-SOEs in Chinese circumstances. Chinese public companies can be divided into SOEs and non-SOEs. The China Securities Regulatory Commission (CSRC) uses CLs as a means to regulate listed companies, which is similar to the United States (Ding & Suardi, 2019).

In China, state-owned enterprises possess resource advantages, such as government guarantees and favorable credit, and executives in SOEs are appointed and assessed by the Chinese

government (Cao et al., 2017; Zhang et al., 2016; Lee & Wang, 2016; Li et al., 2008; Adhikari et al., 2006).

Compared with non-SOEs, SOEs are associated with the government and corresponding regulatory agencies and tend to lobby the regulatory authorities to avoid supervision and punishment. Empirical evidence shows a negative relationship between political connections and enforcement actions (Correia, 2014; Yu & Yu, 2011). Under the same circumstances, SOEs are less likely to be punished by the authorities, thereby weakening their impact on CEO turnover. Cao et al. (2017) suggest that companies with strong political connections are less likely to experience executive turnover. It is more likely that CEOs of non-SOEs will be held accountable for reputational damage (Lin et al., 2020).

Additionally, China has a "guanxi" cultural tradition (Yu et al., 2016). Political relations are more pronounced in countries with high levels of corruption, weak legal systems, and low judicial independence (Faccio, 2006).

Therefore, we put forward the second hypothesis.
H2: The relationship between comment letters and CEO turnover is more significant in non-SOEs than in SOEs.

Marketisation, comment letters, and CEO turnover
Marketisation, as an external environmental factor, has a significant impact on corporate governance. The marketisation index accurately reflects the level of marketisation for each region (Zeng & Wang, 2015; Lin & Su, 2009; Conyon & He, 2014: Du et al., 2015; Jiang et al., 2022).

Since the deepening of market-oriented reforms, the degree of marketization in China has significantly improved, and the market now plays a vital role in resource allocation. However, economic development and marketization processes vary significantly across different regions in China (Kang & Kim, 2012; Kong et al., 2023; Liang, 2017;). This study examines whether the degree of marketization affects the impact of comment letters on CEO turnover. In regions with high degrees of marketization, information is generally more transparent, the market dominates resource allocation, and the degree of government intervention in enterprises is low. Compared to regions with relatively low degrees of marketization, high-marketization regions have more efficient corporate governance (Lin et al., 2009; Liu et al., 2023; Liu & Zhang, 2017).

Figure 2 displays the provinces that received comment letters between 2015 and 2020. Guangzhou province received the highest number of comment letters, and coastal areas received more comment letters than inland areas. This observation is consistent with Figure 3, which shows the average regional marketization index from 2015 to 2020. The figure reveals that coastal regions, such as Shanghai, Beijing, Guangdong, and Jiangsu, have high degrees of marketization, while Tibet, Ningxia, and Qinghai have relatively low marketization indexes.

Due to the incomplete legal systems and high levels of government intervention in emerging markets, CEOs in these areas may not be quickly exposed or punished for their actions. In contrast, regions with more market-oriented development have fairer business environments, less government intervention, and fewer rent-seeking activities, which increase the likelihood of executives being punished for illicit activities (Lu et al., 2020; Su & He, 2011; Su & Wan, 2014). In these regions, enterprises are also more susceptible to media exposure, and stakeholders can obtain information in a timely and effective manner. A high degree of marketization can help reduce information asymmetry between executives and shareholders, enabling supervisors to evaluate companies with sufficient information and managers to be replaced more easily in response to comment letters (Tang et al., 2020; Xie et al., 2022; Xu et al., 2021.

This paper puts forward the following assumptions:
H3: In regions with higher degree of marketisation, comment letters are more likely to lead to forced CEO turnover by playing a supervisory role.

6. Sample, Variables, and Descriptive Statistics

6.1 Data sources and sample selections

This paper investigates the influence of comment letters on forced CEO turnover in Chinese enterprises that are listed on the Shanghai Stock Exchange (SHSE) and the Shenzhen Stock Exchange (SZSE) from 2015 to 2020. The comment letter data is obtained from the "regulatory information disclosure" section of the stock exchange and is sourced from the China Stock Market & Accounting Research Database (CSMAR). The data for forced CEO turnover is manually collected from their resumes, which are also available in CSMAR. Furthermore, the remaining data used in this study is also obtained from CSMAR. We excluded firms that meet the following criteria: (1) flagged for Special Treatment (ST) or *ST due to their continuous loss-making over two years, which results in abnormal financial conditions, and there are certain limitations on ST stocks exchange in China (Liu & Anbumozhi, 2009), as well as a risk of being delisted; (2) financial services companies, which are excluded due to their industry's uniqueness, and (3) companies with incomplete data on critical variables. To prevent outliers, we perform winsorization at the 1% level in both tails. Additionally, we control for industry fixed effects and year fixed effects. The sample period contains 13,245 firm-year observations.

6.2 Model

This research explores whether comment letters affect the likelihood of forced CEO turnover using the linear probability model (LPM). The LPM simplifies the interpretation of coefficients, although it may produce fitted values outside the 0 to 1 range (Wooldridge, 2002). However, according to Chyz and Gaertner (2017), the LPM is suitable for the purposes of this study. Table 8 shows the logit model, margin effects, and odds ratio in the robustness tests.

$$Forced\ CEO\ turnover_{i,t+1} = \alpha_0 + \beta_1 CurrentCL_{i,t} + \beta_k Controls_{i,t} + I_j + T_t + \varepsilon_{i,t} \ (1)$$
$$Forced\ CEO\ turnover_{i,t+1} = \alpha_0 + \beta_2 NumCL_{i,t} + \beta_k Controls_{i,t} + I_j + T_t + \varepsilon_{i,t} \ (2)$$

Table 3 provides a definition of the variables, and we have controlled for industry (I) and year (T) fixed effects. If the coefficients are positive and significant, hypothesis 1 is supported, indicating that the probability of forced CEO turnover increases with the number of comment letters.

6.3 Key variables

6.3.1 CEO turnover

The dummy variable TO_FORCE is equal to 1 if a turnover occurs in year t and 0 otherwise (Cao et al., 2017). TO_FORCE is measured in the following period (t+1) while all other variables are measured in the current period (t) (Cao et al., 2017).

There are 2,532 CEO turnover events during the sample period. In Table 1, the reasons for CEO turnover are provided by the CSMAR database. Change of job takes up the highest percentage, which accounts for 33.45% of the total turnover. The second one is the completion of acting duties, which represents 26.42%, and the third is for personal reasons (14.97%). Only 0.79% of turnover fall into the dismissal category. We reclassify reasons for job changes, resignations, personal reasons, and reasons not given (Firth et al., 2006b). Other turnovers are classified as normal with one exception: if the CEO is less than 60 years old and the stated reason is retirement, we classify this turnover as forced.

We can track the destinations of departing CEOs through the resume information provided by CSMAR. For instance, job changes can be classified as forced or voluntary turnover. If a departing CEO subsequently holds a position that is better than the previous, then it is classified as non-forced (Huson et al., 2004). Table 2 summarizes the reasons for forced and normal CEO turnover and the corresponding frequency. A re-evaluation of 1535 cases based on a search for CEO resumes revealed 863 cases of non-forced CEO turnover. We can see that 728 cases remain as chairman or vice chairman, and 135 cases are promoted (123 CEOs are promoted to chairman or vice chairman; 12 CEOs become government officials). The remaining 672 cases are classified as forced turnover. These include 176 CEOs who accept new positions ranked lower than CEO positions and 496 cases without traceable destination information. In conclusion, there are 1827 normal turnover events, which account for 72.16% of the total, and 705 cases of forced turnover (27.84%). As this research aims to investigate the impact of comment letters on forced CEO turnover, voluntary turnovers are ignored as they are not relevant to the research question (Chakraborty et al., 2007).

6.3.2 Comment letters variables

Comment letters (CurrentCL) equal 1 if the firm received a CL in year t, 0 otherwise. NumCL represents the number of comment letters received by the company in year t. It is used to verify the reliability of the conclusions (Su & Xu, 2019; Yao et al., 2021).

6.3.3 Marketisation

The degree of provincial-level market development is from the National Economic Research Institute of China (NERI) marketisation index (Fan et al., 2019; Wang, 2017), which captures the overall level of market development, including the degree of market competition, government intervention, the development of product and factor markets, and the legal environment (Fan et al., 2019; Fan, 2007; Lu et al., 2020; Ruan et al., 2019; Wang, 2017). The higher the value, the more developed the region is (Fan et al., 2019). A higher marketisation index is associated with less government intervention and more regional economic freedom (Fan et al., 2019). The marketisation index provides a systematic tool to quantitatively differentiate regions within China (Fan, 2007; Ruan et al., 2019; Wang, 2017). The index measures the progress of transition toward a market economy in 31 provincial administrative regions of the Chinese mainland (Wang, 2017). A high marketisation indicator is equal to 1 for observations in the highest annual quintile of marketisation and 0 otherwise. A low marketisation indicator is equal to 1 for observations in the lowest annual quintile of marketisation and 0 otherwise. According to Fan (2021), the registration location of listed companies is divided into high and low marketisation groups. This paper discusses the impact of CL on forced CEO turnover in different marketisation areas.

6.3.4 Control variables

The control variables included in the model used by Chyz and Gaertner (2017) have been added, which capture variables that prior accounting research has shown to influence executive turnover (Cao et al., 2017; Chyz & Gaertner, 2017; Deng et al., 2019; Guo & Masulis, 2015; Tran et al., 2016). The following variables have been controlled in the model: Size (the natural logarithm of total assets), Lev (total liability scaled by total assets), ROA (net income divided by total assets), BM (the firm's book value of equity divided by market value of equity), FirmAge (the natural logarithm of one plus years since incorporation), Tenure (the number of years in a CEO position), State (a dummy variable that equals 1 if the firm is a state-owned enterprise and 0 otherwise), Board (the number of directors taken as the natural logarithm), Dual (equals 1 if the Chairman also holds the position of CEO and 0 otherwise), Growth (current year's operating income divided by previous year's operating income -1), Tobin's Q (the book value of assets minus the book value of equity plus the market value of equity, divided by the book value of assets). Additionally, the industry and year dummy variables have also been controlled. Details of the variable definitions are shown in Table 3.

7. Empirical Results

7.1 Descriptive statistics

Table 4 presents the descriptive statistics, including mean, standard deviation, minimum, median, and maximum values. The mean value for TO_FORCE is 0.052, while the means for CurrentCL and NumCL are 0.247 and 0.375, respectively.

7.2 Correlations

Table 5 presents the Pearson correlation analysis. Consistent with H1, we can see that comment letters (both CurrnetCL and NumCL) are positively and significantly associated with forced CEO turnover. Therefore, it is suggested that companies that receive comment letters are more likely to replace CEOs.

7.3 Regression results

Column (1) and column (2) in Table 6 show a positive coefficient of 0.025 (0.012) and are significant at 1% between TO_FORCE and comment letters (CurrentCL & NumCL), which supports hypothesis 1. Comment letters will significantly increase the probability of CEO turnover. The more comment letters that are received, the more serious problems the company faces, the greater the "cost" brought to the company, and the higher the probability of CEO turnover.

Columns (3) and (4) present the results in SOEs, and columns (5) and (6) show the relationship between forced CEO turnover and comment letters in non-SOEs. In Table 6, the coefficients (0.020 and 0.009) in columns (5) and (6) are positive and significant above 5%, while the coefficients (-0.010 and 0.015) in columns (3) and (4) are insignificant. The results suggest that the impact of comment letters on forced CEO turnover is more significant in non-SOEs than in SOEs. We can see that comment letters have a more evident and positive relationship with forced CEO turnover in non-SOEs than in SOEs, which supports hypothesis 2.

In Table 7, columns (1) and (2) present the sample under developing area, and columns (3) and (4) present the companies in developed area. In developed areas, the coefficient of comment letters (CurrentCL and NumCL) is positive and significant above 5% with forced CEO turnover, whereas in developing areas, the relationship is insignificant. The results support the hypothesis that marketisation plays a role in external corporate governance. They also show that companies registered in areas with a high degree of marketisation have an increased probability of CEO turnover after receiving comment letters. Compared with regions with a low degree of marketisation, regions with a high degree of marketisation urge companies to replace the CEO after comment letters. The results suggest that comment letters play a supervisory role in CEO

turnover and are also influenced by marketization.

8. Robustness

In this section, a series of additional tests are conducted to ensure the robustness of the results of this study.

8.1 The Logit model

To further verify the results, we employ the logit model (columns (1) and (2)), marginal effect (column 3), and odds ratio (columns (4) and (5)) in Table 10 (Chyz & Gaertner, 2017). The coefficients of comment letters (CurrentCL and NumCL) are positive (0.633 and 0.263) and significant at 1%, indicating that comment letters increase the likelihood of forced CEO turnover. The margins effects in column (5) show that a one unit increase in comment letters raises the probability of forced CEO turnover by 1.2%. The odds-ratio in columns (4) and (5) is above 1, suggesting a positive correlation between comment letters and forced CEO turnover.

8.2 Propensity score matching with difference in difference (PSM-DID)

We also employ PSM-DID to mitigate potential endogeneity (Chen et al., 2019; Cunningham et al., 2020). The sample period is expanded from 2010 to 2020 to better compare the changes in pre- and post-comment letters between comment-letter firms and non-comment-letter firms (Yao & Xue, 2019; Yao et al., 2021).

We use the PSM approach (one-to-one nearest neighbor matching without replacement) to construct the treatment group and control group (Johnston & Petacchi, 2017). We define the variables in the DID model as follows: Treat equals 1 for treatment firms (i.e. firms that receive comment letters) and zero for control firms (propensity-score-matched firms). Post equals one if the firm received a CL in the current year, and zero otherwise. The variable $Treat_{i,t} * Post_{i,t}$ is the interaction of these two variables. Control variables $Controls_{i,t}$ in model (3) are the same as those in model (1). Finally, we construct the following DID model:

$$TO\_FORCE_{i,t+1} = \beta_0 + \beta_1 Treat_{i,t} * Post_{i,t} + \beta_2 Treat_{i,t} + \beta_3 Post_{i,t} + \beta_4 Controls_{i,t} + Industry + Year + u_{i,t} \quad (3)$$

Bases for matching treatment and control companies: we employed a propensity score matching approach to create a balanced comparison between treatment and control groups. The key matching criteria included control variables such as Board, Growth, TobinQ, Dual, FirmAge, BM, ROA, Lev, and Size. To assess the covariate balance between the matched pairs, we referred to Zhu et al. (2023) and presented the results in Table 8. As indicated in Table 8, the mean comparisons of the matched pairs are not statistically significant, indicating the successful balancing of covariates through the matching procedure. We matched each treated firm with a control firm based on variables that influence the likelihood of a company receiving a CL. The

matching process involved pairing the nearest treatment firms with control firms at a 1:1 ratio without replacement, and the resulting samples were examined for equilibrium. In Table 9, we provided an overview of the matches, revealing that only 12 treated firms were unable to find a control firm using PSM.

In column (6) of Table 10, the regression results of the PSM-DID test are reported. The coefficient of $Treat_{i,t} * Post_{i,t}$ is 0.005, which is statistically significant at the 10% level, consistent with hypothesis 1. The results indicate that compared to firms that never received a CL, forced CEO turnover increased when firms received at least one CL.

8.4 Placebo test

To eliminate the interference of omitted variables and other random factors, we performed a placebo test based on the PSM-DID sample by randomly selecting the interactions and repeating the process 1000 times (Chen & Xie, 2022; Hao & Wang, 2021; Li et al., 2018). The probability density of the pseudo-t-values is shown in Figure 6. It is evident that the pseudo-t-values largely follow a normal distribution centered on zero, indicating that our conclusions are not influenced by other unobserved factors.

8.5 Substitute variables

The number of days it takes for a company to respond to comment letters can indicate the time and challenges involved in addressing the issues raised. The Securities and Exchange Commission (SEC) requires companies to respond within 10 business days, but most registrants take between 10 and 40 days to reply (Calderon & Gao, 2022). In China, the China Securities Regulatory Commission (CSRC) usually requires a response within 15 days (about 97.01%), and almost all companies respond within 30 days (about 92.93%), though only about 45.15% reply on time in Table 13 (Hu & Fu, 2020).

Table 12 provides descriptive statistics on the time required for responses, with an average of 7.337 days between the release of the comment letter and the requested reply date, and an average of 12.410 days between the requested reply date and the actual reply date, indicating a delay of 5.076 days on average. However, some companies respond before the deadline. The variables LnTimecost, LnOverdue, and LnTimeactual, which represent the natural logarithm of the number of days between different stages of the response process, are defined by Cassell et al. (2015) and summarized in Table 13.

The results in Table 13 show that there is a positive and significant relationship between time cost and forced CEO turnover. This suggests that companies that take longer to respond to comment letters may face more severe problems and a higher risk of CEO turnover.

8.6 Include the sample with special treatment

In the baseline regression, samples with special treatment are excluded. However, as these firms are more likely to receive CLs, we re-estimate the sample with special treatment Eq. (1) (Hao & Wang, 2021; Su & Xu, 2019). The results are reported in Table 14. The coefficients of CurrentCL and NumCL in Columns (1) & (2) are significantly positive at the 1% level, which further validates the main conclusion.

8.7 Variable substitution of forced CEO turnover

Due to the fact that information unavailable turnover accounts for the majority (70.35%) of forced turnover, we eliminated it and replaced it with Force (which equals TO_FORCE excludes information unavailable turnover) as the substitute variable. The results are shown in columns (1) and (2) of Table 15, which are positive and significant, and consistent with H1.

8.8 Falsification tests

A falsification test is conducted to conform the preliminary results are not spurious. Specifically, we re-estimate our main tests by substituting unforced CEO turnover (Normal) for Forced CEO turnover (Denis et al., 1997; Fee et al., 2013; Weisbach, 1988). Fee et al. (2013) find that unforced CEO departures are unlikely to result from organisational stress or crisis that drives board action to deliberately change its leader. The results of our falsification test (reported in Table 15 column 3&4) are consistent with our hypothesis, as Normal CEO turnover is not significantly positively related to comment letters (Chyz & Gaertner, 2017).

8.9 Text analysis

Text analysis has gradually become a research hotspot in the field of corporate finance (Liu & Moffitt, 2016). Text information can not only explain digital information, but also convey information about operating conditions and development prospects. For example, Antons et al. (2020) find that the text contains much more information than the financial ratio. According to Li (2008), reports with a high level of readability have a higher probability of sustaining earnings. Therefore, text information reduces information asymmetry and enhances regulatory efficiency (Narayan, 2019). Tone is the linguistic feature of text information which usually shows as the frequency of positive and negative words (Henry, 2008; Loughran & McDonald, 2011b). Huang et al. (2012) find that the tone of text information affects investor behavior. Shirata et al. (2011) can distinguish between normal enterprises and bankrupt enterprises through word frequency analysis. Larcker and Zakolyukina (2012) find that false statements contain too many positive words and too few negative words. Comment letters are text data, which contain more detailed information than other data. Chinese text analysis is focused on annual reports and limited on comment letters. The majority of comment letters are issued by

stock exchanges and can be accessed on their official website. Therefore, we use text mining technology in the comment letters to analyse the impact of text information on forced CEO turnover.

Word frequency statistics is the process of counting the frequency of a word or phrase in the text after word segmentation. This paper extracts Chinese comment letters from 2015-2020 for text processing. According to figure 7, we conclude the process of text analysis. The comment letter extraction and text processing flow are as follows. The first step is to segment the text with Python open source "Jieba" and then count the frequency of words in the text. Simultaneously, these data are cleaned according to the stop list to filter out words with low information content, such as punctuation symbols, personal pronouns, and mood connectives. Second, based on LM dictionary, we use different translation software (Youdao Dictionary and Kingsoft Vocabulary) to translate the English words into Chinese. Then, analyze the text data for emotions (Lei et al., 2023).

Based on the existing literature, there are two measurements of tone analysis. The first one is Tone1, which is equal to the number of positive words minus the number of negative words divided by total words (Davis et al., 2014). The other Tone2 is equal to the number of positive words minus the number of negative words divided by the sum of the number of positive words and negative words (Price et al., 2012). The range of the tone is [-1,1], which indicates that the higher the value, the more positive the tone is.

The results of text analysis are shown in Table 16. We can see that CEOwords (the number of CEO mentions in comment letters), question_num (the number of questions that the stock exchange requires companies to respond), and Turnover (the number of Turnover shown in comment letters) have a significant positive relationship with forced CEO turnover. And columns (4) and (5) show that the tone of comment letters is negatively related to forced CEO turnover.

9. Contributions

First, this study contributes to research on the determinants (Cassell et al., 2019; Myers et al., 2013) and consequences (Johnston & Petacchi, 2017) of comment letters. Comment letters is an important non-punitive form of administrative supervision. They can alleviate information asymmetry and strengthen executive supervision. This paper examines the effectiveness of comment letters from the perspective of CEO turnover, providing the micro factors of comment letters.

Second, this paper has significant practical significance in contributing to the literature on regulatory scrutiny. This paper also finds that high marketisation areas play a role in the "supervision effect" of comment letters on forced CEO turnover. Therefore, the conclusions of this paper provide empirical evidence on the effectiveness of comment letters.

Third, from the perspective of supervision, the existing literature studies the impact of CEO

turnover on financial fraud, restatement, and performance. However, there is limited literature on the effects of comment letters on CEO turnover. This paper fills this gap by demonstrating that comment letters significantly increase the likelihood of CEO turnover, thereby broadening the scope of research on the determinants of CEO turnover.

Furthermore, the existing literature mainly takes American companies as samples, and there is scarce research evidence of China as an emerging market. This study also contributes to the literature on different types of ownership. Compared with Yang (2021), this paper also investigates the impact of marketisation. In addition, comment letters provide an important mechanism for external supervision.

10. Conclusions

This article investigates the influence of comment letters on CEO turnover from various perspectives. The paper reveals that companies located in developed areas and non-SOEs substantially affect the association between CEO turnover and comment letters, confirming the "supervision effect" of comment letters. Therefore, this paper suggests that the supervision of comment letters is effective, and listed companies should enhance their corporate governance practices to improve the efficiency of supervision.

Figure 1 Comment letters received from 2015 to 2020
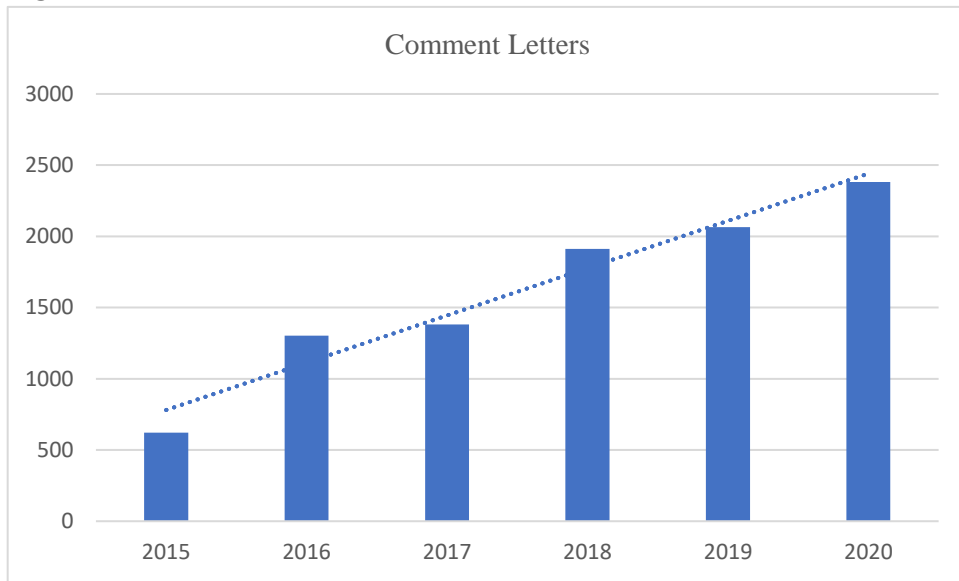
Comment Letters

**Figure 2 Comment letters in China (2015-2020)**

Figure 3 Marketization in China (2015-2020)
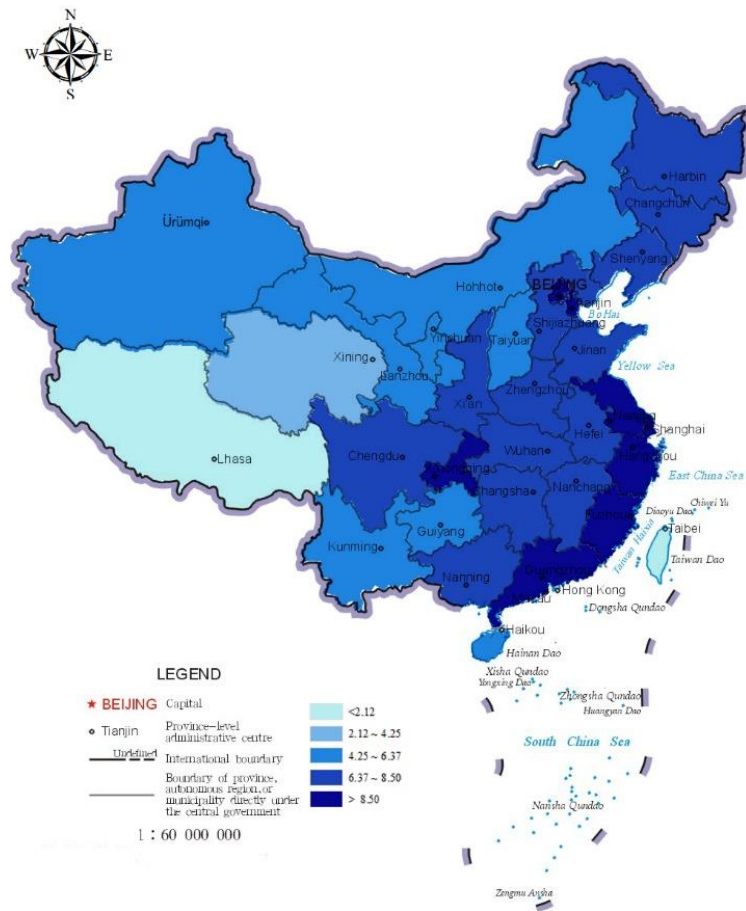
Figure 4 Before match in PSM
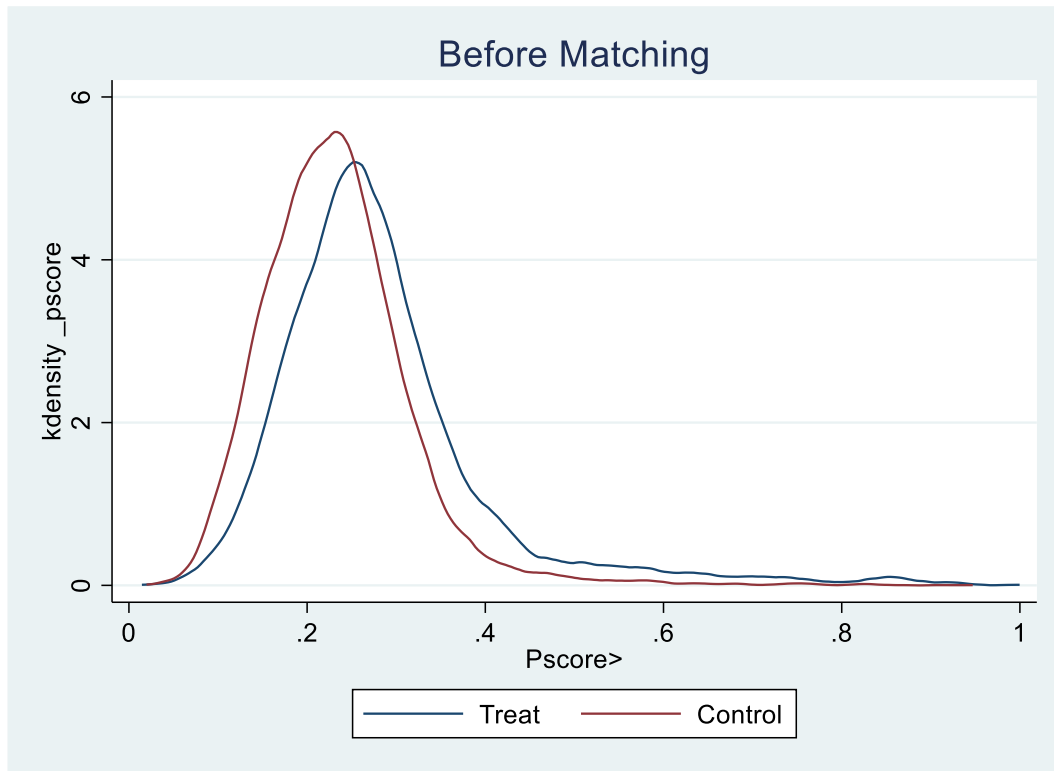
Figure 5 After match in PSM

Figure 6 Placebo test

Kernel density estimate

kernel = epanechnikov, bandwidth = 0.2201
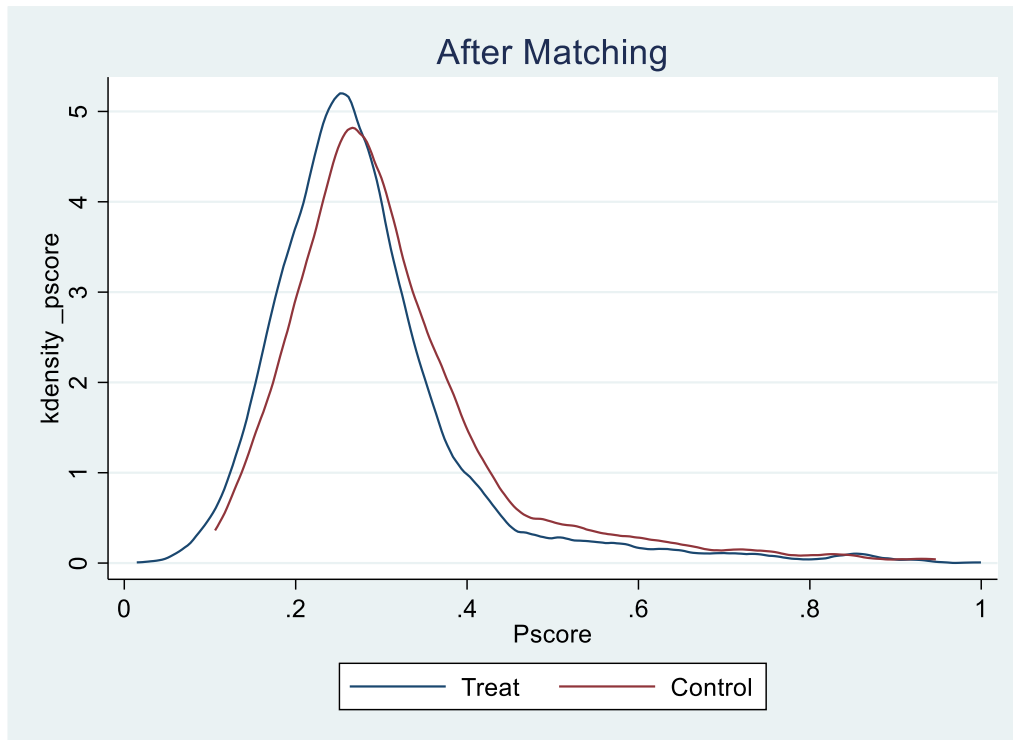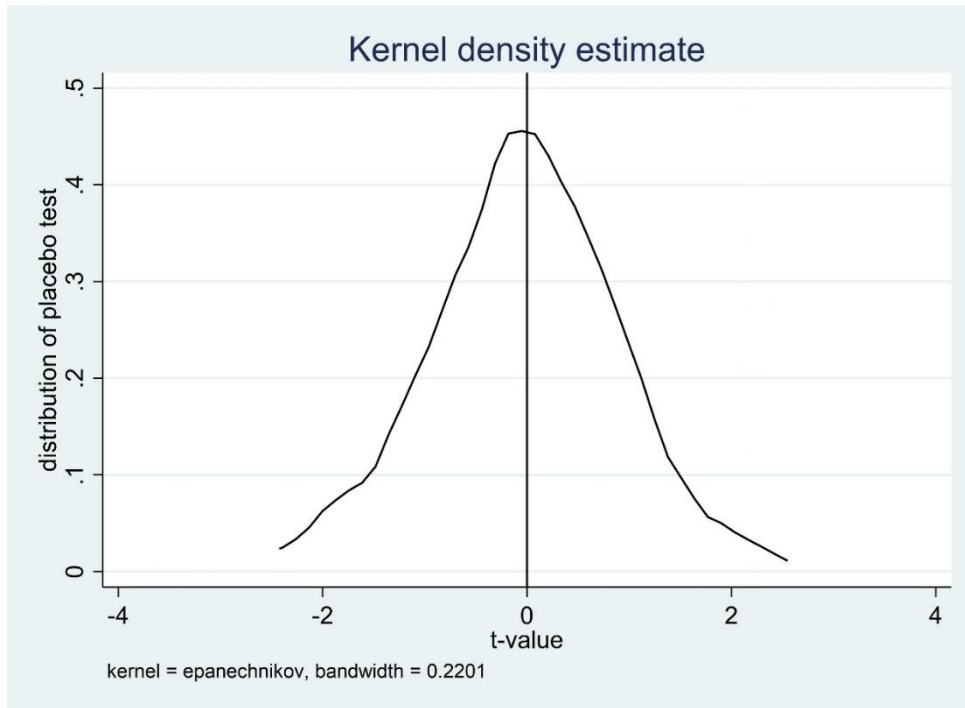
Figure 7 Text analysis

Table 1 Reasons for CEO turnovers presented in CSMAR database

Reasons	Freq.	Percent	Cum
Change of job	847	33.45%	33.45%
Contract expiration	669	26.42%	59.87%
Completion of acting duties	137	5.41%	65.28%
Corporate governance reform	62	2.45%	67.73%
Dismissal	112	4.42%	72.16%
Health	34	1.34%	73.50%
Legal disputes	3	0.12%	73.62%
No reason given	197	7.78%	81.40%
Personal reasons	379	14.97%	96.37%
Resignation	20	0.79%	97.16%
Retirement	72	2.84%	100.00%
Total	2532	100.00%	100.00%

Table 2 Classification of forced and voluntary CEO turnover

Reasons for turnover	Number of observations	Frequency (%)
1.Normal turnover	1827	72.16%
Retirement	59	2.33%
Completion of acting duties	137	5.41%
Health	34	1.34%
Corporate governance reform	62	2.45%
Legal disputes	3	0.12%
Contract expiration	669	26.42%
Remaining as board chairman or vice chairman	728	28.75%
Important government position	12	0.47%
Promoted to board chairman or vice chairman	123	4.86%
2. Forced turnover	705	27.84%
New position ranked lower than CEO position	176	6.95%
Retirement age less than 60	13	0.51%
Dismissed	20	0.79%
Information unavailable	496	19.59%
Total number of observations	2532	100.00%

Table 3 Variable Definitions

Variables	Notation	Definition
Forced CEO turnover	TO_FORCE	TO_FORCE is a dummy variable that equals one when a CEO has forced turnover and zero otherwise.
Marketization	L_marketization	A low marketization indicator is an indicator equal to one for observations in the lowest annual quintile of marketization and zero otherwise.
	H_marketization	A high marketization indicator is an indicator equal to one for observations in the highest annual quintile of marketization and zero otherwise.
State	State	State is a dummy variable that equals one if the firm is a state-owned enterprise (SOE) and zero otherwise.
LnTimecost	LnTimecost	LnTimecost is equal to the natural logarithm of the number of days between letter release date and reply date plus one.
LnTimeactual	LnTimeactual	LnTimeactual is equal to the natural logarithm of the number of days between the issue date of the comment letter and the actual reply date plus one (Cassell et al., 2015).
LnOverdue	LnOverdue	LnOverdue is equal to the natural logarithm of the number of days between requested reply date and actual reply date plus one.
Another Forced CEO turnover	Force	Force (which equals TO_FORCE excludes information unavailable turnover) as the substitute variable. Force is a dummy variable that equals one when a CEO has forced turnover and zero otherwise.
Text analysis	CEOwords	The number of words spoken by the CEO in comment letters) and forced CEO turnover.
	question_num	The number of questions that the stock exchange requires companies to respond to) and forced CEO turnover.
	Turnoverword	The number of instances of turnover shown in comment letters
Normal CEO turnover	Normal	Normal is a dummy variable that equals one when a CEO has normal turnover and zero otherwise.
Tone Analysis	Tone1	Tone1 is equal to the number of positive words minus the number of negative words divided by total words (Davis et al., 2014).
	Tone2	Tone2 is equal to the number of positive words minus the number of negative words divided by the sum of the number of positive words and negative words (Price et al., 2012).
Comment Letters Variables	CurrentCL	CurrentCL equals one if the firm received a CL in year t, 0 otherwise.
	NumCL	NumCL means the number of CLs received up to year t, 0 otherwise.
Control variables	Size	The natural logarithm of total assets.
	Lev	Total liability is scaled by total assets.
	ROA	ROA equals net income divided by total assets.
	BM	The book-to-market ratio equals the firm's book value of equity divided by the market value of equity.
	FirmAge	The natural logarithm of firm age in years.

	Board	Natural logarithm of the number of directors on the board.
	Dual	Dual equals one if Chairman also holds the position of CEO and zero otherwise.
	Growth	The growth rate of operating revenue equals the current year's operating income divided by the previous year's operating income.
	Tobin's Q	Firm value can be measured by Tobin's Q, defined as the book value of assets minus the book value of equity plus the market value of equity, divided by the book value of assets.

Table 4 Descriptive Statistics

This table reports descriptive statistics for the full sample. Definitions of variables are shown in Table 3. Statistical significance is denoted by asterisks, with *, **, and *** indicating significance at the 10%, 5%, and 1% levels, respectively. Forced CEO turnover is 1 for forced out and 0 otherwise. Forced CEO turnover is measured in the t+1 period, while all other variables are measured in the t period.

Variable	N	Mean	SD	Min	p50	Max
Board	13245	2.116	0.198	1.609	2.197	2.708
Growth	13245	0.196	0.49	-0.591	0.109	4.712
TobinQ	13245	1.951	1.187	0.842	1.57	8.02
Dual	13245	0.287	0.452	0	0	1
FirmAge	13245	2.929	0.293	2.079	2.944	3.555
BM	13245	1.005	1.15	0.053	0.63	8.25
ROA	13245	0.04	0.063	-0.363	0.038	0.219
Lev	13245	0.419	0.197	0.056	0.411	0.886
Size	13245	22.305	1.27	19.777	22.146	26.36
TO_FORCE	13245	0.052	0.222	0	0	1
CurrentCL	13245	0.247	0.431	0	0	1
NumCL	13245	0.375	0.861	0	0	22
Marketization	13245	3	1.414	1	3	5

Table 5 Correlations

Table 5 presents Pearson correlation analysis. Details of the variable definitions are shown in Table 3. Forced CEO turnover is measured at t+1 period, while all other variables, which are measured at t period, are denoted with *, **, and *** to indicate statistical significance at the 10%, 5%, and 1% levels. Additionally, forced CEO turnover is coded as 1 for forced out and 0 for all other cases.

	Board	Growth	Tobin'sQ	Dual	FirmAge	BM	ROA	Lev	Size	TO FORCE	CurrentCL	NumCL	Marketization
Board	1												
Growth	0.023***	1											
Tobin's Q	-0.101***	-0.006	1										
Dual	-0.178***	0.015*	0.056***	1									
FirmAge	0.101***	0.006	-0.035***	-0.116***	1								
BM	0.150	0.020**	-0.266***	-0.109***	0.199***	1							
ROA	0.012	0.004	0.062***	0.027***	-0.039***	-0.156***	1						
Lev	0.146***	0.027***	-0.168***	-0.113***	0.154***	0.533***	-0.298***	1					
Size	0.271***	0.038***	-0.351***	-0.174***	0.136***	0.627***	0.008	0.523***	1				
TO FORCE	0.023***	0.000	0.010	-0.077***	0.011	0.047***	-0.099***	0.080***	0.043***	1			
CurrentCL	-0.079***	0.005	0.030***	0.040***	0.026***	-0.012	-0.157***	0.064***	-0.065***	0.074***	1		
NumCL	-0.084***	0.005	0.027***	0.033***	0.031***	-0.016*	-0.202***	0.065***	-0.069***	0.085***	0.759***	1	
Markektization	-0.088***	0.009	0.029***	0.119***	-0.060***	-0.101***	0.052***	-0.077***	-0.077***	-0.052***	-0.014	-0.007	1

Table 6 The impact of comment letters on forced CEO turnover

Table 6 reports the results of our main tests examining the comment letters on forced CEO turnover. Regression coefficients are reported above, while standard errors are reported below. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels for examining H1&2. This table uses the Linear Probability Model with robust standard errors controlling for firm-level clustering. Details of variable definitions are shown in Table 3. Columns 1&2 are full samples, columns 3&4 are SOEs, and columns 5&6 illustrate the results for non-SOEs. T-statistics are shown in parentheses below the regression coefficients and are computed using standard errors clustered by firm. Forced CEO turnover is measured at t+1 period, while all other variables are measured at t period.

	(1) TO_FORCE	(2) TO_FORCE	(3) TO_FORCE	(4) TO_FORCE	(5) TO_FORCE	(6) TO_FORCE
Board	-0.014	-0.014	-0.008	-0.021	-0.018	-0.018
	(-0.442)	(-0.432)	(-0.111)	(-0.287)	(-0.560)	(-0.565)
Growth	-0.000	-0.000	-0.004	-0.001	-0.000	-0.000
	(-0.724)	(-0.707)	(-1.350)	(-0.437)	(-0.541)	(-0.518)
Tobin's Q	0.002	0.002	-0.005	-0.004	0.003*	0.003*
	(0.898)	(0.926)	(-1.007)	(-0.916)	(1.789)	(1.795)
Dual	-0.045***	-0.045***	-0.049**	-0.059***	-0.048***	-0.048***
	(-4.226)	(-4.205)	(-2.342)	(-2.693)	(-3.902)	(-3.874)
FirmAge	0.117	0.109	0.174	0.172	0.054	0.050
	(1.410)	(1.325)	(0.900)	(0.865)	(0.618)	(0.572)
BM	-0.005	-0.005	0.002	0.004	-0.010*	-0.009*
	(-1.172)	(-1.129)	(0.366)	(0.634)	(-1.720)	(-1.690)
ROA	-0.179***	-0.171***	-0.316*	-0.307	-0.153***	-0.146***
	(-3.559)	(-3.407)	(-1.730)	(-1.571)	(-2.931)	(-2.804)
Lev	0.044	0.044	0.153	0.157	0.026	0.026
	(1.229)	(1.223)	(1.516)	(1.501)	(0.706)	(0.691)
Size	-0.019	-0.019	-0.065**	-0.071**	-0.015	-0.015
	(-1.535)	(-1.561)	(-2.110)	(-2.311)	(-1.211)	(-1.185)
CurrentCL	0.025***		-0.010		0.020***	
	(4.146)		(-0.685)		(3.280)	
NumCL		0.012***		0.015		0.009**
		(2.968)		(1.249)		(2.327)
_cons	-0.186	-0.138	1.004	1.193	-0.097	-0.074
	(-0.547)	(-0.406)	(1.167)	(1.369)	(-0.276)	(-0.208)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
N	13245	13245	4152	4152	9093	9093
adj. R^2	0.012	0.011	0.015	0.015	0.018	0.018

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 7 Marketization, CEO turnover and comment letters

Table 7 displays the results of hypothesis 3, showing the regression coefficients above and the standard errors below. Statistical significance at the 10%, 5%, and 1% levels is denoted with *, **, and *** respectively. The Linear Probability Model with robust standard errors controlling for firm-level clustering is used in this table. Details of variable definitions are provided in Table 3. Columns 1 and 2 illustrate the sample in developing areas, and columns 3 and 4 show the sample in developed areas. T-statistics, computed using standard errors clustered by firm, are presented in parentheses below the regression coefficients. Additionally, forced CEO turnover is measured at t+1 period, while all other variables are measured at t period.

	(1)L_marketization TO_FORCE	(2)L_marketization TO_FORCE	(3)H_marketization TO_FORCE	(4)H_marketization TO_FORCE
Board	-0.052	-0.051	0.012	0.014
	(-0.555)	(-0.538)	(0.180)	(0.217)
Growth	0.000	0.000	0.001	0.001
	(0.231)	(0.284)	(0.367)	(0.502)
Tobin's Q	0.001	0.001	0.002	0.002
	(0.218)	(0.230)	(1.045)	(1.005)
Dual	-0.036	-0.035	-0.049*	-0.049*
	(-1.224)	(-1.188)	(-1.961)	(-1.939)
FirmAge	0.239	0.229	-0.041	-0.073
	(1.123)	(1.073)	(-0.191)	(-0.343)
BM	0.001	0.001	0.001	0.002
	(0.051)	(0.090)	(0.195)	(0.271)
ROA	-0.382***	-0.370***	0.016	0.029
	(-3.161)	(-3.088)	(0.166)	(0.310)
Lev	0.034	0.032	-0.024	-0.023
	(0.391)	(0.376)	(-0.386)	(-0.362)
Size	0.005	0.003	-0.014	-0.013
	(0.188)	(0.091)	(-0.467)	(-0.416)
CurrentCL	0.024		0.037***	
	(1.530)		(2.774)	
NumCL		0.015		0.016**
		(1.473)		(2.023)
_cons	-0.850	-0.746	0.191	0.252
	(-0.981)	(-0.863)	(0.254)	(0.330)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	2642	2642	2649	2649
adj. R^2	0.011	0.011	0.014	0.012

T statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

ROBUSTNESS TESTS

Table 8 PSM covariate balance.

Variable Matched	Unmatched Matched	Mean Treated	Control	Bias(%)	t- test t	p>t
Board	U	2.125	2.166	-20.2	-14.09	0.000
	M	2.126	2.124	0.7	0.58	0.562
Growth	U	9.397	0.411	1.2	0.75	0.451
	M	0.354	0.380	0	-0.16	0.875
TobinQ	U	2.151	2.051	4.7	3.21	0.001
	M	2.149	2.200	-2.4	-1.44	0.151
Dual	U	0.266	0.224	9.8	6.8	0.000
	M	0.265	0.267	-0.4	-0.33	0.741
FirmAge	U	2.871	2.884	-3.8	-2.75	0.006
	M	2.871	2.879	-2.5	-2.34	0.019
BM	U	1.063	1.136	-5.7	-4.01	0.000
	M	1.064	1.072	-0.6	-0.53	0.597
ROA	U	0.033	0.052	-29.6	-20.23	0.000
	M	0.034	0.035	-0.6	-0.49	0.621
Lev	U	0.451	0.425	12.9	8.98	0.000
	M	0.451	0.452	-0.5	-0.42	0.675
Size	U	22.163	22.392	-17.3	-12.28	0.000
	M	22.165	22.174	-0.6	-0.51	0.607

Table 9 Overview of matches

psmatch2: Treatment assignment	psmatch2: Common support		Total
	Off support	On support	
Untreated	0	6,455	6,455
Treated	12	14,071	14,083
Total	12	20,526	20,538

Table 10 Robustness tests

Columns (1) and (2) investigate the impact of comment letters on forced CEO turnover using the logit mode. Column (3) tests the marginal effects of the impact of comment letters on forced CEO turnover. Columns (4) and (5) test the odds ratio. Column (6) presents the results of PSM–DID. Treat equals 1 for treatment firms (i.e., firms that receive comment letters) and zero for control firms (propensity-score-matched firms). Post equals one if the firm has received a CL in the current year, and zero otherwise. c.Treat#c.Post is the interaction of Treat and Post. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1) Logit TO_FORCE	(2) Logit TO_FORCE	(3) Margins TO_FORCE	(4) Odds-ratio TO_FORCE	(5) Odds-ratio TO_FORCE	(6) PSMDID TO_FORCE
Board	0.126	0.147	0.007	1.135	1.158	0.009
	(0.611)	(0.707)	(0.707)	(0.611)	(0.707)	(1.099)
Growth	-0.000	-0.000	-0.000	1.000	1.000	-0.000
	(-0.120)	(-0.109)	(-0.109)	(0.120)	(0.109)	(-0.338)
Tobin's Q	0.029***	0.0290**	0.001**	1.030***	1.029**	0.001*
	(2.580)	(2.526)	(2.522)	(2.580)	(2.526)	(1.761)
Dual	-0.904***	-0.894***	-0.042***	-0.405***	-0.409***	-0.033***
	(-7.744)	(-7.647)	(-7.458)	(-7.744)	(-7.647)	(-9.410)
FirmAge	-0.255	-0.569	-0.210	-0.819	1.333**	-0.0268
	(-0.613)	(-1.448)	(-0.679)	(-1.205)	(1.996)	(-0.8865)
BM	0.025	0.032	0.002	1.026	1.032	0.004**
	(0.720)	(0.904)	(0.903)	(0.721)	(0.904)	(2.134)
ROA	-3.741***	-3.451***	-0.162***	-0.024***	-0.032***	-0.133***
	(-7.915)	(-7.072)	(-6.973)	(-7.915)	(-7.072)	(-5.304)
Lev	0.711***	0.737***	0.035***	2.036***	2.089***	0.034***
	(2.865)	(2.958)	(2.948)	(2.865)	(2.958)	(3.516)
Size	0.074*	0.067	0.003	1.077*	1.069	0.002
	(1.717)	(1.560)	(1.558)	(1.717)	(1.561)	(0.971)
CurrentCL	0.633***			1.883***		
	(7.334)			(7.334)		
NumCL		0.263***	0.012***		1.300***	
		(7.590)	(7.481)		(7.591)	
c.Treatl#c.Post						0.006*
						(1.674)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
N	13245	13245	13245	13245	13245	20538

t statistics in parentheses
* *p* < 0.1, ** *p* < 0.05, *** *p* < 0.01

Table 11 Frequency distribution for the number of days to respond

Require reply days	count	percentage	Actual reply days	count	percentage	Extend days	count	percentage
0-2	821	12.82%	0-2	667	10.42%	-266--1	1041	16.38%
3-7	4122	64.37%	3-7	2535	39.60%	0	1842	28.77%
8-10	854	13.33%	8-14	1808	28.23%	1-14	2796	43.67%
11-15	2124	6.49%	15-30	940	14.68%	15-60	613	9.54%
16-273	190	2.99%	31-288	453	7.07%	61-287	111	1.64%

Table 12 Descriptive statistics for the time cost of comment letters

Variable	N	Mean	SD	Min	p50	Max
Require reply days	6404	7.337	14.31	0	6	273
Actual reply days	6404	12.410	19.36	0	7	288
Extend days	6404	5.076	20.75	-266	1	287

Table 13 Time cost and CEO turnover

This table reports the relationship between time spending and forced CEO turnover in the full sample. Details of variable definitions are shown in Table 3. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels. Forced CEO turnover is 1 for forced out and 0 otherwise. Forced CEO turnover is measured at t+1 period, while all other variables are measured at t period.

	(1) TO_FORCE	(2) TO_FORCE	(3) TO_FORCE
Board	-0.014	0.000	-0.014
	(-0.425)	(0.009)	(-0.441)
Growth	-0.000	-0.000	-0.000
	(-0.5556)	(-0.562)	(-0.555)
Tobin's Q	0.001	0.002	0.001
	(0.815)	(0.844)	(0.827)
Dual	-0.045***	-0.043***	-0.045***
	(-4.214)	(-3.885)	(-4.222)
FirmAge	0.117	0.115	0.116
	(1.418)	(1.127)	(1.411)
BM	-0.005	-0.003	-0.005
	(-1.169)	(-0.679)	(-1.171)
ROA	-0.166***	-0.175***	-0.167***
	(-3.248)	(-3.281)	(-3.268)
Lev	0.052	0.053	0.052
	(1.445)	(1.372)	(1.445)
Size	-0.022*	-0.021*	-0.023*
	(-1.810)	(-1.726)	(-1.825)
LnTimecost	0.007**		
	(2.343)		
LnTimeactual		0.009**	
		(2.083)	
LnOverdue			0.006**
			(2.093)
_cons	-0.121	-0.403	-0.109
	(-0.354)	(-1.219)	(-0.318)
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
N	13245	13245	13245
adj. R^2	0.011	0.010	0.011

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 14 Include the sample with special treatment

This table examines the hypothesis 1 using LPM with the inclusion of the special treatment. Details of variable definitions are shown in Table 3. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels. Forced CEO turnover is 1 for forced out and 0 otherwise. Forced CEO turnover is measured at t+1 period, while all other variables are measured at t period.

	(1) TO_FORCE	(2) TO_FORCE
Board	-0.040	-0.039
	(-0.948)	(-0.922)
Growth	-0.000	-0.000
	(-0.437)	(-0.385)
Tobin's Q	-0.002	-0.001
	(-0.111)	(-0.065)
Dual	-0.041***	-0.041***
	(-2.779)	(-2.781)
FirmAge	-0.036	-0.045
	(-0.288)	(-0.361)
BM	-0.004	-0.004
	(-0.889)	(-0.838)
ROA	-0.193***	-0.178***
	(-2.836)	(-2.636)
Lev	0.071	0.074
	(1.558)	(1.636)
Size	-0.033**	-0.035**
	(-2.075)	(-2.186)
CurrentCL	0.033***	
	(4.133)	
NumCL		0.016***
		(3.022)
_cons	0.658	0.753
	(1.350)	(1.546)
Industry	Yes	Yes
Year	Yes	Yes
N	14567	14567
adj. R^2	0.013	0.012

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 15 Substitute variables on forced CEO turnover and Falsification tests

Columns (1) and (2) use Force to replace TO_FORCE variables, and column (3) and (4) examine the relationship between normal turnover and comment letters. Details of variable definitions are shown in Table 3. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1)	(2)	(3)	(4)
	Force	Force	Normal	Normal
Board	0.000	0.013	-0.014	-0.014
	(0.013)	(0.669)	(-0.316)	(-0.328)
Growth	-0.000**	0.000	0.004***	0.004**
	(-2.318)	(0.756)	(2.233)	(2.266)
Tobin's Q	0.001	-0.002	-0.002	-0.002
	(1.088)	(-0.776)	(-0.889)	(-0.875)
Dual	-0.016***	-0.017***	-0.148***	-0.148***
	(-2.719)	(-2.632)	(-8.290)	(-8.287)
FirmAge	-0.033	-0.029	-0.068	-0.058
	(-0.826)	(-0.610)	(-0.427)	(-0.366)
BM	-0.005**	0.000	0.007	0.007
	(-2.141)	(0.128)	(1.312)	(1.317)
ROA	-0.027	-0.049**	-0.094*	-0.096*
	(-1.108)	(-2.011)	(-1.673)	(-1.696)
Lev	-0.021	-0.017	-0.086*	-0.080
	(-0.978)	(-1.041)	(-1.711)	(-1.580)
Size	0.010	0.015**	0.013	0.011
	(1.335)	(2.219)	(0.851)	(0.716)
CurrentCL	0.007**		-0.010	
	(2.064)		(-1.205)	
NumCL		0.003*		-0.007
		(1.728)		(-1.642)
_cons	-0.348	-0.487*	0.641	0.657
	(-1.299)	(-1.692)	(1.160)	(1.187)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	13245	13245	13245	13245
adj. R^2	0.007	0.007	0.016	0.016

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 16 Text analysis

Table 14 examines the impact of comment letters on forced CEO turnover through text analysis. Column (1) shows the relationship between CEOwords (the number of words spoken by the CEO in comment letters) and forced CEO turnover. Column (2) presents the relationship between question_num (the number of questions that the stock exchange requires companies to respond to) and forced CEO turnover. Column (3) analyzes the relationship between turnovers (the number of instances of turnover shown in comment letters) and forced CEO turnover. Columns (4) and (5) illustrate the tone of the comment letters. Details of variable definitions are shown in Table 3. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1) TO_FORCE	(2) TO_FORCE	(3) TO_FORCE	(4) TO_FORCE	(5) TO_FORCE
Board	-0.017	-0.015	-0.015	-0.014	-0.014
	(-0.524)	(-0.478)	(-0.481)	(-0.440)	(-0.424)
Growth	-0.000	-0.000	-0.000	-0.000	-0.000
	(-0.528)	(-0.574)	(-0.504)	(-0.740)	(-0.764)
Tobin's Q	0.001	0.001	0.001	0.002	0.002
	(0.795)	(0.812)	(0.852)	(0.922)	(0.945)
Dual	-0.045***	-0.044***	-0.045***	-0.044***	-0.045***
	(-4.209)	(-4.158)	(-4.155)	(-4.161)	(-4.174)
FirmAge	0.121	0.100	0.119	0.111	0.110
	(1.462)	(1.216)	(1.434)	(1.342)	(1.323)
BM	-0.005	-0.005	-0.005	-0.005	-0.005
	(-1.103)	(-1.156)	(-1.095)	(-1.136)	(-1.139)
ROA	-0.167***	-0.146***	-0.172***	-0.173***	-0.172***
	(-3.249)	(-2.817)	(-3.349)	(-3.414)	(-3.419)
Lev	0.050	0.050	0.053	0.046	0.046
	(1.386)	(1.386)	(1.476)	(1.277)	(1.281)
Size	-0.023*	-0.021*	-0.023*	-0.021*	-0.021*
	(-1.821)	(-1.699)	(-1.881)	(-1.728)	(-1.738)
CEOwords	0.020***				
	(2.785)				
question_num		0.002***			
		(3.197)			
Turnoverword			0.006*		
			(1.787)		
Tone1				-0.604***	
				(-4.535)	
Tone2					-0.050***
					(-4.863)
_cons	-0.122	-0.090	-0.105	-0.117	-0.105
	(-0.356)	(-0.264)	(-0.305)	(-0.344)	(-0.308)
Industry	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
N	13245	13245	13245	13245	13245
adj. R^2	0.012	0.012	0.011	0.013	0.013

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

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