China Journal of Accounting Research 14 (2021) 151–182

HOSTED BY

Contents lists available at ScienceDirect

China Journal of Accounting Research

journal homepage: www.elsevier.com/locate/cjar

Do goodwill impairments affect audit opinions? Evidence from China

Ziye He *, Dong Chen, Jianxin Tang

Economics and Management School, Wuhan University, Wuhan, Hubei 430072, China

ARTICLE INFO

Article history:
Received 2 June 2020
Accepted 14 March 2021
Available online 20 April 2021

JEL classification:
M41
M42

Keywords:
Goodwill impairments
Audit opinions
Material misstatements
Earnings management
Economic fundamentals

ABSTRACT

There has been a steady growth of goodwill impairments in the Chinese stock market since the adoption of the impairment approach in accounting. The influence of goodwill impairments on a firm's financial position and profitability give reason to doubt its current and future performance. We examine whether auditors, as a crucial external monitor, identify the information risks of goodwill impairments and express their concerns about financial reporting quality in their audit opinions. Using a sample of firms listed on China's A-share market from 2007 to 2017, we test the association between goodwill impairments and the type of audit opinion received in the same financial period. Our findings are as follows. First, the probability of receiving a modified opinion increases with the amount of goodwill impairments. Second, the positive association between goodwill impairments and modified audit opinions is driven primarily by earnings management risks. Third, this positive association is more salient when auditors are industry experts and there is no auditor–client mismatch. Fourth, auditors are more sensitive to the amount of goodwill impairments than to their mere existence. Overall, we document that auditors perceive goodwill impairments as a signal of information risks and communicate their concerns to investors to avoid litigation.

1. Introduction

According to the International Accounting Standards adopted in 2004, " a cash-generating unit to which goodwill has been allocated shall be tested for impairment" by comparing the carrying amount with the recov-

* Corresponding author.
E-mail addresses: ziyehe@whu.edu.cn (Z. He), dongchen@whu.edu.cn (D. Chen), 00000121@whu.edu.cn (J. Tang).

https://doi.org/10.1016/j.cjar.2021.03.002
1755-3091/

erable amount of the unit. That is, goodwill should be test for impairment by the firm at least annually (IAS 36, paras. 90&96). Since the adoption of this ''impairment-only approach'', there has been an ongoing debate about whether it best reflects the economic reality of goodwill and provides more useful information than the ''amortization approach'', or whether it is more vulnerable to manipulation. China adopted the new impairment method in 2007. Since then, due to an increasing number of mergers and acquisitions, goodwill and impairments in China's A-share market have been growing rapidly. We observe cases where firms recognize no impairment in the first two years after acquisition but record a significant amount of goodwill impairments in the third year, when the performance target set at acquisition cannot be met. This phenomenon has unanticipated effects on the stock market, leading to security mispricing and resource misallocation.

In this study, we examine whether auditors are responsive to goodwill impairments recognized by their clients, and how audit opinions are affected by the different risks signaled by goodwill impairments. An auditor's main duty is to obtain sufficient audit evidence and assess whether there are material misstatements. Accordingly, if auditors are satisfied with the presentation of financial reports, they express the unmodified opinion that the financial reports comply with accounting standards and give a true and fair view in all material respects. However, the nearly unverifiable nature of the fair value of goodwill makes it similarly difficult for auditors to verify goodwill impairments (Ramanna, 2008; Ayres et al., 2019). Goodwill impairments have profound effects on a firm's financial position and profitability. On the one hand, firms may be aggressive in recording large amounts of goodwill to make their acquisitions look successful. On the other hand, firms may be conservative in recognizing impairments to retain market expectations. Goodwill is likely to be impaired if a firm does not meet its promised performance target within the required timeframe (e.g., a 3-year performance commitment period). Alternatively, impairments may result from opportunistic incentives for management to manipulate earnings (Holthausen and Watts, 2001; Watts, 2003). Hence, goodwill impairment signals risks associated with both economic fundamentals and earnings management. Reliable information on goodwill is essential for shareholders and potential investors when making investment decisions and appraising firm performance (Zeff and Barton, 2009). Thus, auditors face possible litigation and damage to their reputation if they fail to uphold professional skepticism and issue inappropriate audit opinions.

We find a significant positive association between the probability of receiving a modified opinion and the amount of goodwill impairments, based on a sample of firms listed on China's A-share market from 2007 to 2017. First, we show that auditors identify the material information risks signaled by goodwill impairments and express their concerns about the quality of financial reporting by issuing modified opinions. Second, the positive association between goodwill impairments and modified opinions is driven primarily by risks related to earnings management, rather than to economic fundamentals. One possible explanation is that earnings management increases the risks of material misstatements in financial reports, and investors may be misled by unreliable information when making decisions. Therefore, auditors tend to communicate their concerns about low-quality financial reporting by issuing modified opinions to avoid litigation. As for risks related to economic fundamentals, auditors will not issue a modified opinion if they are satisfied that the entity will continue as a going concern for the relevant period. Although information risks related to economic fundamentals do not mediate the relationship between impairments and modified opinions, our untabulated results show that there is a significant and positive association between material goodwill impairments and information risks related to economic fundamentals. In robustness tests, we address endogeneity issues, use alternative variables, add control variables, and reconstruct the sample. Overall, our results remain unchanged. Cross-sectional tests reveal that the positive association is more salient when the auditor is an industry expert and there is no auditor–client mismatch. Furthermore, auditors are more sensitive to the amount of goodwill impairments than to their mere existence.

Our study makes several important contributions to the literature. First, this study enriches our understanding of auditors' reaction to information risks in the setting of goodwill auditing (Zeng and Lu, 2016; Duan and Chen, 2017; Bo and Wu, 2011). Our results imply that auditors perceive goodwill impairment as a signal of information risks and focus more on ''procedural justice'' (whether the client engages in earnings management) than on ''substantive justice'' (whether there are systemic risks related to economic fundamentals). Second, unlike prior studies that focus on clients or auditors (Lobo et al., 2017; Ayres et al., 2019; Carcello et al., 2020), our study examines the relationship between goodwill impairments and modified audit opinions from the perspective of investors. Investors' reliance on auditors for assurance of reporting quality

places external pressure on them during their audit of goodwill impairments, and auditors face damage to their reputation or litigation if they fail to identify risks and issue inappropriate opinions. Third, this study has important implications for auditors and investors. Auditors should have a comprehensive understanding of the industry environment and the historical performance of their clients prior to the audit, and also maintain a high level of professional skepticism in auditing goodwill so that audit resources can be efficiently used to improve audit quality. Investors should be more prudent in relying on audit opinions so that mispricing problems can be mitigated.

The remainder of this paper is organized as follows. Section 2 outlines the related literature and develops the hypotheses. Section 3 provides the research design. Section 4 presents the empirical results and robustness tests. Section 5 extends the discussion of our findings. The final section offers our concluding remarks.

2. Literature review and hypothesis development

2.1. Prior literature on goodwill impairment

There are various sources of goodwill impairments, such as takeover premiums (Hayn and Hughes, 2006), overvaluation of stock prices (Gu and Lev, 2011), and managerial incentives to manipulate earnings (Francis et al., 1996). Studies indicate that goodwill impairments are value relevant and provide information for decision-making (Churyk, 2005; Bens et al., 2011). Using data on European firms, AbuGhazaleh et al. (2012) find that investors incorporate impairment losses into their valuation of firms. Li et al. (2011) suggest that investors and analysts update their expectation of a firm's future profitability after the announcement of impairment. Nonetheless, fair value for goodwill is highly subjective, difficult to verify, and susceptible to managerial opportunism (Holthausen and Watts, 2001; Watts, 2003). SFAS 142 gives managers the discretion to manipulate earnings by delaying goodwill impairments (Ramanna and Watts, 2012). Li and Sloan (2017) compare the timeliness of goodwill impairments before and after the implementation of SFAS 142. They posit that in the post-SFAS 142 period, goodwill balances are more inflated and impairments are recognized in a less timely manner. However, investors do not fully anticipate the decreased timeliness of goodwill impairments, and the discretion in SFAS 142 leads to real effects, such as security mispricing. The adoption of SFAS 142 also opens the door to potential earnings manipulation, and the negative impacts of goodwill impairments on reported earnings are used by small firms that engage in a "big bath" strategy (Sevin and Schroeder, 2005; Jordan & Clark, 2004). AbuGhazaleh et al. (2011) provide similar evidence from the U.K. that goodwill impairments are associated with CEO changes, income smoothing, and incentives to take a big bath. Stenheim and Madsen (2016) posit that firms report more and larger impairment losses if they exhibit strong smoothing or big bath incentives. In general, there is ample evidence that managerial self-interest and earnings management often motivate firms' impairment decisions (Lhaopadchan, 2010).

2.2. Prior literature on audit opinions

The results for the association between accounting accruals and modified opinions are mixed. Bartov et al. (2001) document a positive association between the absolute value of discretionary accruals and the probability of receiving a modified opinion. Bradshaw et al. (2001) find a non-insignificant relationship between accruals and modified opinions. Butler et al. (2004) posit that modified opinions indicate auditors' concerns about the going concern basis of accounting and are not related to earnings management. Studies that use data from China also yield mixed results. On the one hand, investors rely on the earnings information of listed firms to make investment decisions. If investors are misled by earnings management, the auditors who provide assurance of financial reporting quality may face litigation. Consequently, auditors express their concerns by issuing modified opinions to reduce these risks (Xu, 2004). On the other hand, Xia and Yang (2002) posit that auditors tend to focus more on firms' losses due to management fraud than on their engagement in earnings management. Other studies examine the relationship between information risks and modified audit opinions. Several suggest that the probability of receiving modified opinions increases as the risk of bankruptcy, default, or litigation increases (Lennox, 2000; Biddle and Hilary, 2006; Lam and Mensah, 2006). Duan and Chen (2017) provide evidence that asset impairment influences the assessment of audit risk and is positively associ-

ated with the probability of receiving a modified opinion. Using evidence from China, Bo and Wu (2011) find a significant and positive relationship between clients' information risks and modified opinions. Auditors react to information risks related to both earnings management and economic fundamentals but treat them differently (Zhang, 2012). Zhang (2012) argues that the risks of opportunistic disclosure strategies are likely to attract the attention of investors and regulators. In this case, auditors are more stringent in applying professional skepticism to avoid potential detection risks (Song and He, 2008), and consequently, the probability of issuing a modified opinion increases.

2.3. Prior literature on goodwill auditing

Auditors may be poorly positioned to evaluate the assumptions made in determining the fair value of goodwill, and sometimes they neglect the indicators of impairments (Glaum et al., 2018). Due to the technical difficulty of evaluating impairment decisions, auditors and clients may hold opposite opinions. Ayres et al. (2019) find that the likelihood of an auditor dismissal is negatively associated with the favorability of management's goodwill impairment decisions. Subsequent to the dismissal, firms are more likely to employ new auditors who support the management's impairment decisions. Lobo et al. (2017) find that firms audited by a Big 4–non-Big 4 auditor pair are more likely to record impairments than firms audited by a Big 4–Big 4 auditor pair. A recent study on this topic suggests that non-audit fees are negatively related to the likelihood of goodwill impairments. This association is driven primarily by clients' motivation to influence external auditors (Carcello et al., 2020). In addition, unverifiable impairment tests are more difficult to audit, and the increased audit risk leads to higher audit fees (Ye et al., 2016). Auditors attest to the acquired goodwill with professional skepticism, and increase their audit fees to maintain a high-quality audit (Zheng and Li, 2018).

2.4. Goodwill impairment in a Chinese setting

In 2007, China implemented a new corporate accounting standard, *CAS 8 Impairment of Assets*. It abandons the amortization approach and requires goodwill, and its cash-generating units (CGUs), to be tested annually for impairments (CAS 8, para 2). Between 2014 and 2015, a relatively loose liquidity environment and related policies facilitated the diversification of financing and payment methods used to facilitate mergers and acquisitions (M&As), resulting in a surge in acquired goodwill (Wei and Zhu, 2019). In 2018, the total amount of goodwill and impairments in the A-share market reached 1.45 trillion Chinese yuan and 60 billion Chinese yuan, respectively. On the one hand, target firms commit to high performance to attract acquirers, who then overvalue them to boost the share price. On the other hand, achieving performance targets may trigger the vesting conditions that serve as equity incentives for the management of acquirers. This alignment of interests aggravates the collusion between acquirers and acquirees, leading to the common phenomenon in the Chinese M&A market of "high performance commitment, high acquired goodwill and high goodwill impairments related to earnings management" (Li and Yao, 2019). The same impairment approach adopted by the U.S. and the E.U. has also been criticized for providing management with the discretion to determine the fair value of goodwill in certain scenarios (Holthausen and Watts, 2001; Watts, 2003). In addition, goodwill constitutes an increasing portion of total assets (Zeff and Barton, 2009). In summary, studies of different countries show that goodwill accounting is relatively unverifiable and that management has incentives to manipulate and delay goodwill impairments.

2.5. Hypothesis development

Internal managers have the discretion to make impairment decisions using proprietary information about goodwill. Given the unverifiable nature of goodwill impairments and their broad effects on financial position and profitability, there is more uncertainty regarding the true and fair presentation of financial reports when a large amount of impairments is recognized. In this case, auditors weigh their tolerance of accounting manipulation against the risks of material misstatements (Zeng and Lu, 2016).

If auditors agree that misstatements related to goodwill impairments will not affect the true and fair presentation of financial reports in a material way, they tend to communicate the issues to management before

issuing audit opinions. Hence, in this case, we expect to find no association between goodwill impairments and modified opinions. On the contrary, if auditors find it particularly difficult to verify the estimations and assumptions used in impairment tests, and the unverifiable impairments will materially compromise the quality of accounting information, they tend to express their concerns about financial reporting quality with a modified opinion to avoid potential audit failure and litigation from investors (Menon and Williams, 1994). Therefore, in this case, we anticipate a positive association between goodwill impairments and modified opinions. For these reasons, we propose the following hypothesis:

H1: Ceteris paribus, the probability of receiving a modified audit opinion is not associated with the amount of goodwill impairments.

Information risk is the possibility that the quality of firm-specific information related to investors' pricing decisions is low, and the risk is undiversifiable. There are two types of information risks. The first is innate, such as risks related to the business model or operating environment; the second is discretionary and subject to management interventions (Francis et al., 2005). Goodwill impairment may arise from innate factors, such as poor decision-making or a performance target set at acquisition that is difficult to meet because of a weak economic environment. Consequently, auditors may question the firm's future profitability or even its ability to continue as a going concern. Alternatively, goodwill impairment may arise from discretionary factors, such as managerial manipulation of accounting earnings (Liu and Liu, 2014). In such a case, the accounting information does not reliably reflect true financial performance, and users who rely on this information to make decisions may be misled (Liu, 2009; Cao and Bu, 2013).

In both scenarios, the recognized goodwill impairment indicates potential information risks and the lower quality of the client's accounting information. Auditors are responsible for assuring investors that the accounting information contained in financial statements is not materially misstated, and tend to issue a modified audit opinion if the client exhibits high information risks related to goodwill impairments, to avoid reputational damage and loss of the client (Zeng and Lu, 2016). Collectively, we propose the following hypothesis:

H2: The association between goodwill impairments and the probability of receiving a modified audit opinion is driven by information risks related to both economic fundamentals and earnings management.

3. Data and research design

3.1. Data

We focus on firms listed on the A-share market of the Shenzhen and Shanghai stock exchanges between 2007 and 2017. We retain non-special treatment (ST) firms with positive balances of goodwill in the CSMAR database and exclude firms from the financial sector. We also replace all missing values of goodwill impairments with 0 and require all control variables to have non-missing data. By adopting this screening standard, we obtain a final sample of 8,504 firm-year observations for H1. We include year and industry dummies and cluster standard errors at the firm level in all of the regressions. All of the continuous variables are winsorized at the 1% and 99% levels. See Table 1 for the sample selection process.

3.2. Research design

We use the following logistic regression model to test H1:

$$\begin{aligned} OPINION_{it} = {} & \beta_0 + \beta_1 IMPAIR_{it} + \beta_2 LAGOP_{it} + \beta_3 LOSS_{it} + \beta_4 LNTA_{it} + \beta_5 AGE_{it} + \beta_6 GROWTH_{it} \\ & + \beta_7 SOE_{it} + \beta_8 LEV_{it} + \beta_9 ROA_{it} + \beta_{10} COST_{it} + \beta_{11} BIG4_{it} + \beta_{12} HARD_{it} + \beta_{13} SP_{it} \\ & + \beta_{14} OCF_{it} + \beta_{15} CAPINTEN_{it} + \sum Year + \sum Industry + \varepsilon \end{aligned} \quad (1)$$

The dependent variable $OPINION_{it}$ equals 1 if the auditor issues a modified opinion or an unmodified opinion with an explanatory paragraph, and 0 otherwise. The independent variable $IMPAIR_{it}$ is the ratio of goodwill impairments to total assets. Following the literature (Ayres et al., 2019; Francis, 2011; Bo and Wu, 2011), we control factors that could potentially affect audit opinions, such as audit opinions received in a prior financial year (*LAGOP*), audit fees (*COST*), auditor expertise (*BIG4*), and the difficulty of the audit work (*HARD*). In general, auditors are more likely to issue a modified opinion if they issued a modified opinion in the prior year, if they are employed by a Big 4 audit firm, or if the audit work is difficult to perform (Blay and Geiger, 2013; Ayres et al., 2019; Zeng and Lu, 2016). However, higher audit fees may not improve audit quality and have no association with modified opinions (Craswell et al., 2002; Francis, 2011). We control for factors that may affect impairment decisions, including loss before extraordinary items (*LOSS*), low profitability (*SP*), operating cash flows (*OCF*), and capital intensity (*CAPINTEN*). Firms are more likely to experience financial risks and impair goodwill if they post a loss, exhibit low profitability or operating cash flows, or have higher capital intensity (Ayres et al., 2019; Zeng and Lu, 2016). We also control for firm-level characteristics (Gu and Lev, 2011; Reynolds et al., 2004; Carcello et al., 2020), including firm size (*LNTA*), firm age (*AGE*), sales growth (*GROWTH*), leverage ratio (*LEV*), profitability (*ROA*), and state ownership (SOE). See Appendix A1 for variable definitions.

To examine H2, we first use the following model to calculate information risks:

$$VOL_{it} = \beta_0 + \beta_1 DA_{it} + \beta_2 LEV_{it} + \beta_3 GROWTH_{it} + \beta_4 OCF_{it} + \beta_5 LNTA_{it} + \beta_6 SOE_{it} + \beta_7 HOLD_{it} + \beta_8 IND_{it} + \beta_9 LEAVE_{it} + \beta_{10} DUAL_{it} + YEAR\_FE + FIRM\_FE + \varepsilon \quad (2)$$

Here, information risks are proxied by the performance volatility of the firm across multiple financial periods so that the deviation of performance from the normal level can be extracted for each financial year. First, higher operating risks and poor financial performance increase performance volatility; second, earnings management also increases performance volatility once the manipulated earnings are reversed in the following periods. Overall, this annual deviation represents both operating risks and earnings management risks (Quan and Wu, 2010; Zhang and Li, 2012), and will significantly affect the auditors' evaluation of the risks of material misstatements in the financial reports. Therefore, performance volatility is an appropriate proxy for information risks (Bharath et al., 2008). In particular, performance volatility (VOL_{it}) is the 3-year standard deviation of return on equity from *t-2* to *t* (Adams et al., 2005; Cheng, 2008; Quan and Wu, 2010). Unlike Zeng and Lu (2016), Francis et al. (2005) posit that the quality of accruals reveals the mapping of accounting earnings to cash flows and that lower earnings quality implies higher information risks. However, the estimation of information risks depends on the specific model used to measure accrual quality, and will probably increase the noise in calculations in our setting. We therefore use accrual quality as an alternative proxy

Table 1
Sample selection.

Panel A H1	
	Company-year
Data from the CSMAR database for the years 2007 to 2017 (ST firms and firms from financial sectors are excluded)	10,879
Less missing values for all control variables	2,375
Total observations for H1 (2007–2017)	8,504
Panel B H2	
	Company-year
Data from the CSMAR database for the years 2007 to 2017 (ST firms and firms from finance sectors are excluded)	10,879
Less missing values for all control variables	2,375
Less missing values for risks related to earnings management and risks related to economic fundamentals	1,701
Total observations for H2 (2007–2017)	6,803

for information risks in a robustness test to provide comparable evidence. We use the following model from Kothari et al. (2005) to calculate earnings management (DA_{it}), because it considers the future increase of non-discretionary accruals and controls for firms' growth:

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{i,t-1}} + \alpha_2 [\frac{\Delta REV_{i,t}}{A_{i,t-1}}] + \alpha_3 \frac{PPE_{i,t}}{A_{i,t-1}} + \alpha_4 \frac{ROA_{i,t}}{A_{i,t-1}} + \varepsilon$$

Here, $A_i$represents a firm's total assets in year *t-1*; ΔREV_idenotes the firm's current operating revenue; PPE_i is the firm's current property, plant, and equipment;ROA_i is the firm's current return on assets. Apart from the measures included in model (1), measures of the efficiency of corporate governance (Zeng and Lu, 2016) are added as control variables in model (2). They include the ratio of independent directors (*IND*), shares owned by the largest shareholder (*HOLD*), duality of CEO and chairperson (*DUAL*), and CEO turnover (*LEAVE*). We use the absolute value of *DA* to ensure that it increases with the level of earnings management. Risks related to earnings management (*DARISK*) are calculated as *DA* times its coefficient, $DARISK = \beta_1 DA_{it}$. Risks associated with economic fundamentals (*INRISK*) are the portion of performance volatility that cannot be explained by information risks related to earnings management, $INRISK = VOL - DARISK$.

Next, we adopt the following three-step method to investigate the mediating effects of total information risks, risks related to economic fundamentals, and risks related to earnings management (Deng and Xu, 2017; Lin et al., 2018):

Step 1: Regress audit opinion (*OPINION*) on goodwill impairment (*IMPAIR*). This gives the coefficient for the association between the dependent and the independent variable, *c* (see model 1).

Step 2: Regress the mediators (*VOL*, *DARISK*, and *INRISK*) on the independent variable. This gives the coefficients for the association between the mediators and the independent variable, a_1, a_2, and a_3:

$$VOL_{it}(DARISK_{it} \text{ or } INRISK_{it}) = \beta_0 + \beta_1 IMPAIR_{it} + \beta_2 LOSS_{it} + \beta_3 LNTA_{it} + \beta_4 GROWTH_{it} + \beta_5 AGE_{it} + \beta_6 SOE_{it} + \beta_7 LEV_{it} + \beta_8 ROA_{it} + \beta_9 BIG4_{it} + YEAR\_FE + FIRM\_FE + \varepsilon \quad (3)$$

Step 3: Regress the dependent variable on both the independent variable and the mediators. This gives the coefficients for the association between the dependent variable and the mediators, b_1, b_2, and b_3:

$$OPINION_{it} = \beta_0 + \beta_1 IMPAIR_{it} + \beta_2 VOL_{it}(DARISK_{it} \text{ or } INRISK_{it}) + Controls + \sum Year + \sum Industry + \varepsilon \quad (4)$$

Controls are the control variables used in Eq. (1). Last, we use the coefficients *a*, *b*, and *c* to conduct a Sobel test to judge whether mediation occurs. We anticipate that the mediating effects will occur if both types of information risks materially impair financial reporting quality.

4. Empirical results and robustness tests

4.1. Descriptive statistics

In Table 2, Panel A shows the descriptive statistics of the full sample. The average ratio of goodwill impairments to total assets is 0.2% and the maximum is 5.5%, which is economically significant. In general, the sample firms have an annual sales growth rate of 4.7%, a leverage ratio of 45%, and an average return on assets of 4%. The proportion of shares owned by the largest shareholder varies from 2% to 89%. About 37% of the board directors are independent. The average values for performance volatility and earnings management are 7.1% and 7.5%, respectively. Panel B provides a comparative analysis of impaired and unimpaired firms. The number of unimpaired firms is almost twice that of impaired firms. Impaired firms are slightly larger and have a lower sales growth rate, higher leverage level, and lower profitability. Moreover, impaired firms have less concentrated ownership, higher capital intensity, and higher performance volatility. Panel C reports the distribution of audit opinions between 2007 and 2017. The number of observations increased significantly during this period. The majority of audit opinions are unmodified opinions, followed by unmodified opinions

Table 2
Descriptive statistics.

Panel A Summary statistics of the full sample

VarName	Obs.	*M*	SD	Min	P25	Median	P75	Max
OPINION	8,504	0.022	0.147	0.000	0.000	0.000	0.000	1.000
IMPAIR	8,504	0.002	0.007	0.000	0.000	0.000	0.000	0.055
DUMMY	8,504	0.332	0.471	0.000	0.000	0.000	1.000	1.000
LAGOP	8,504	0.021	0.144	0.000	0.000	0.000	0.000	1.000
LOSS	8,504	0.070	0.255	0.000	0.000	0.000	0.000	1.000
LNTA	8,504	22.270	1.263	19.256	21.380	22.098	22.978	25.936
AGE	8,504	2.162	0.689	0.693	1.609	2.197	2.773	3.178
GROWTH	8,504	0.047	3.915	−22.152	−0.384	0.110	0.510	20.491
SOE	8,504	0.395	0.489	0.000	0.000	0.000	1.000	1.000
LEV	8,504	0.448	0.206	0.052	0.285	0.447	0.602	1.076
ROA	8,504	0.042	0.050	−0.191	0.016	0.038	0.066	0.202
HOLD	8,504	33.848	14.998	2.197	22.130	31.575	44.270	89.090
IND	8,504	0.372	0.056	0.182	0.333	0.333	0.400	0.800
LEAVE	8,504	0.165	0.372	0.000	0.000	0.000	0.000	1.000
DUAL	8,504	0.239	0.426	0.000	0.000	0.000	0.000	1.000
COST	8,504	13.787	0.753	12.468	13.305	13.688	14.152	16.640
BIG4	8,504	0.066	0.248	0.000	0.000	0.000	0.000	1.000
HARD	8,504	0.269	0.169	0.005	0.142	0.247	0.369	0.761
SP	8,504	0.040	0.194	0.000	0.000	0.000	0.000	1.000
OCF	8,504	0.043	0.071	−0.193	0.005	0.042	0.084	0.252
CAPINTEN	8,504	2.514	2.144	0.384	1.294	1.921	2.966	16.482
VOL	6,803	0.071	0.140	0.004	0.021	0.036	0.067	1.412
DA	6,803	0.075	0.083	0.001	0.023	0.051	0.098	0.557
DARISK	6,803	0.008	0.009	0.000	0.002	0.005	0.010	0.057
INRISK	6,803	0.063	0.139	−0.050	0.014	0.029	0.060	1.412
LNMV	8,504	22.710	0.954	20.681	22.058	22.646	23.307	25.390
RETVOL	8,504	0.139	0.065	0.044	0.093	0.125	0.167	0.394
RETURN	8,504	0.242	0.716	−0.694	−0.231	0.031	0.501	3.162
EBITDA	8,504	0.006	0.040	−0.187	−0.003	0.006	0.017	0.185
ACQ	8,504	0.182	0.386	0.000	0.000	0.000	0.000	1.000
RESTRU	8,504	0.222	0.415	0.000	0.000	0.000	0.000	1.000
DIFF	8,504	0.000	0.454	−0.927	−0.531	0.226	0.330	0.845
SDROA	6,852	0.030	0.043	0.001	0.010	0.018	0.034	0.542
AQ	5,062	0.145	0.255	0.008	0.044	0.077	0.139	1.926

Panel B Comparative analysis of impaired and non-impaired firms

VarName	Obs.		*M*		Median		*t*-test	Wilcoxon test
	Impair = 0	Impair = 1	Impair = 0	Impair = 1	Impair = 0	Impair = 1		
OPINION	5,683	2,821	0.015	0.036	0.000	0.000	−6.861***	−6.975***
IMPAIR	5,683	2,821	0.000	0.006	0.000	0.001	−44.394***	−99.382***
LAGOP	5,683	2,821	0.016	0.032	0.000	0.000	−5.113***	−5.296***
LOSS	5,683	2,821	0.053	0.105	0.000	0.000	−9.966***	−9.766***
LNTA	5,683	2,821	22.224	22.343	22.048	22.170	−4.256***	−4.877***
AGE	5,683	2,821	2.090	2.307	2.197	2.398	−15.323***	−14.252***
GROWTH	5,683	2,821	0.056	0.022	0.122	0.081	0.314	3.959***
SOE	5,683	2,821	0.391	0.400	0.000	0.000	−0.721	−0.984
LEV	5,683	2,821	0.442	0.459	0.442	0.459	−3.560***	−3.712***
ROA	5,683	2,821	0.046	0.034	0.040	0.033	12.040***	9.497***
HOLD	5,683	2,821	34.506	32.459	32.510	30.060	6.745***	6.670***
IND	5,683	2,821	0.371	0.375	0.333	0.333	−3.269***	−2.565**
LEAVE	5,683	2,821	0.159	0.177	0.000	0.000	−2.343**	−2.358**
DUAL	5,683	2,821	0.230	0.253	0.000	0.000	−2.743**	−2.536**
COST	5,683	2,821	13.709	13.929	13.592	13.816	−13.897***	−15.097***
BIG4	5,683	2,821	0.057	0.079	0.000	0.000	−3.911***	−4.240***
HARD	5,683	2,821	0.271	0.269	0.249	0.246	0.677	0.354

(*continued on next page*)

Table 2 (*continued*)

Panel B Comparative analysis of impaired and non-impaired firms

VarName	Obs.		*M*		Median		*t*-test	Wilcoxon test
	Impair = 0	Impair = 1	Impair = 0	Impair = 1	Impair = 0	Impair = 1		
SP	5,683	2,821	0.039	0.040	0.000	0.000	−0.747	−0.390
OCF	5,683	2,821	0.043	0.042	0.042	0.042	0.684	0.739
CAPINTEN	5,683	2,821	2.464	2.567	1.904	1.928	−2.703**	−0.431
VOL	4,546	2,257	0.068	0.074	0.034	0.039	−1.947*	−5.976***
DA	4,546	2,257	0.077	0.071	0.052	0.049	3.666***	3.108***
DARISK	4,546	2,257	0.008	0.007	0.005	0.005	3.666***	3.108***
INRISK	4,546	2,257	0.061	0.066	0.027	0.033	−1.865*	−6.723***
LNMV	5,683	2,821	22.694	22.745	22.635	22.673	−2.573**	−2.701***
RETVOL	5,683	2,821	0.141	0.133	0.127	0.121	5.558***	5.706***
RETURN	5,683	2,821	0.273	0.182	0.054	−0.004	6.110***	4.571***
EBITDA	5,683	2,821	0.007	0.005	0.006	0.006	3.385***	2.157**
ACQ	5,683	2,821	0.179	0.187	0.000	0.000	−0.897	−0.897
RESTRU	5,683	2,821	0.236	0.192	0.000	0.000	5.068***	5.062***
DIFF	5,683	2,821	0.678	−0.346	0.643	−0.304	170.431***	82.746***
SDROA	4,578	2,274	0.027	0.029	0.018	0.020	−2.501***	−5.934***
AQ	3,392	1,670	0.153	0.130	0.079	0.072	4.197***	4.069***

Note: *, **, *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel C Distribution of audit opinions

Year		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Observations		388	486	556	689	820	969	1,098	1,254	1,499	1,714	1,932	11,405
Unmodified opinions		369	463	533	671	803	954	1,074	1,229	1,472	1,684	1,886	11,138
Unmodified opinions with explanatory paragraphs		16	17	19	15	14	10	14	19	24	19	25	192
Modified opinions	Qualified opinions	2	3	0	3	3	4	7	4	2	6	16	50
	Adverse opinions and disclaimers of opinions	1	3	4	0	0	1	3	2	1	5	5	25

Panel D Audit opinions and impaired clients

	Observations	Unmodified opinions	Unmodified opinions with explanatory paragraphs	Qualified opinions	Adverse opinions and disclaimers of opinions
Impaired firms	3,760 (33%)	3,608 (32%)	103 (54%)	32 (64%)	17 (68%)
Unimpaired firms	7,645 (67%)	7,530 (68%)	89 (46%)	18 (36%)	8 (32%)
Total	11,405 (100%)	11,138 (100%)	192 (100%)	50 (100%)	25 (100%)

with explanatory paragraphs (we classify the latter as modified opinions in our empirical analysis). In each year, adverse opinions and disclaimers of opinions are rarely issued. We further compare the distribution of audit opinions between impaired and unimpaired firms. Panel D shows that 68% of the unmodified opinions were issued to unimpaired firms. Consistently, auditors issued more modified opinions to impaired clients. In addition, we observe a large increase in the amount of goodwill, goodwill impairments, and impaired firms between 2007 and 2017 (see Figs. 1–3). In Appendices 2–4, we detail the distribution of impaired firms, the amount of goodwill, and the amount of goodwill impairments in different industries. Industries with a large amount of goodwill are conservative in recognizing impairments, and industries with a large amount of impairments are aggressive in impairing goodwill.

Table 3 shows the correlation coefficient matrix of all of the variables used in Eq. (1). We observe a significant and positive association between goodwill impairments and the probability of receiving modified audit opinions. Information risks, earnings management risks, and economic fundamental risks are all positively related to modified audit opinions and goodwill impairments, except that the association between earnings management risks and goodwill impairments is not significant. In addition, the type of audit opinion received

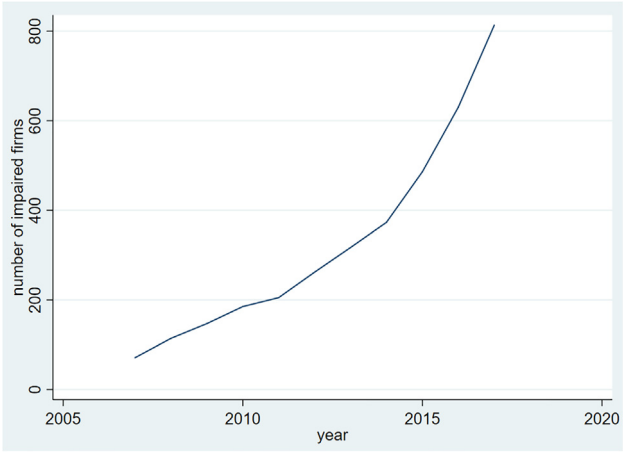

Fig. 1. Number of impaired firms.

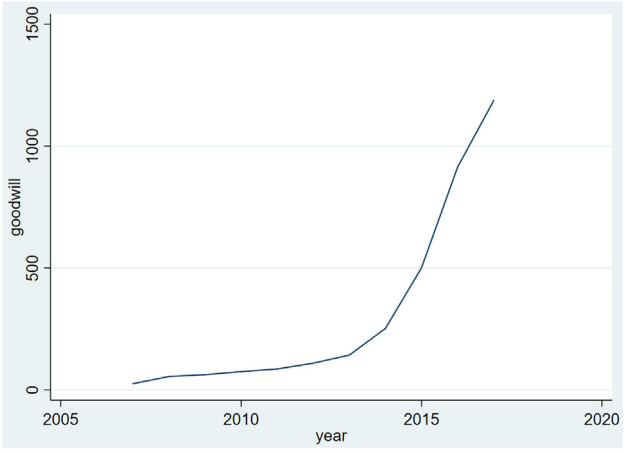

Fig. 2. Magnitude of goodwill (unit: billion yuan).

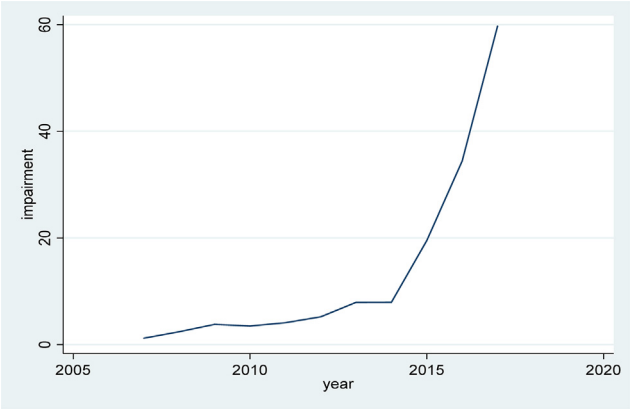

Fig. 3. Magnitude of goodwill impairment (unit: billion yuan).

Table 3
Correlation coefficient matrix.

	OPINION	IMPAIR	LAGOP	LOSS	LNTA	AGE	GROWTH	SOE	LEV	ROA	COST	BIG4	HARD	SP	OCF	CAPINTEN	VOL	DARISK
IMPAIR	**0.13**																	
LAGOP	**0.45**	**0.10**																
LOSS	**0.20**	**0.19**	**0.13**															
LNTA	**−0.07**	**−0.14**	**−0.07**	**−0.08**														
AGE	**0.03**	**−0.04**	**0.05**	**0.03**	**0.28**													
GROWTH	**−0.02**	**−0.04**	−0.02	**−0.17**	0.01	0.00												
SOE	0.00	**−0.09**	0.01	**0.05**	**0.28**	**0.38**	**−0.04**											
LEV	**0.07**	**−0.08**	**0.06**	**0.13**	**0.49**	**0.30**	**−0.03**	**0.25**										
ROA	**−0.17**	**−0.17**	**−0.10**	**−0.57**	−0.01	**−0.09**	**0.17**	**−0.09**	**−0.35**									
COST	−0.02	**−0.03**	−0.01	**−0.02**	**0.76**	**0.23**	0.00	**0.18**	**0.31**	−0.02								
BIG4	**−0.03**	**−0.03**	**−0.03**	**−0.03**	**0.38**	**0.07**	−0.00	**0.16**	**0.12**	**0.05**	**0.50**							
HARD	**−0.03**	**−0.03**	**−0.04**	**−0.03**	**0.04**	**−0.04**	0.01	**−0.12**	**0.30**	**−0.08**	**−0.02**	**−0.06**						
SP	**0.02**	0.00	0.00	**−0.06**	**−0.03**	0.01	**−0.05**	**0.03**	**−0.02**	**−0.16**	**−0.02**	**−0.03**	**−0.03**					
OCF	**−0.06**	−0.02	**−0.05**	**−0.15**	**−0.02**	−0.01	**0.03**	**0.03**	**−0.18**	**0.40**	0.02	**0.10**	**−0.31**	**−0.08**				
CAPINTEN	**0.08**	**0.07**	**0.09**	**0.12**	−0.00	**0.08**	−0.01	**−0.07**	**−0.07**	**−0.20**	**−0.08**	**−0.06**	**−0.07**	**0.11**	**−0.23**			
VOL	**0.21**	**0.08**	**0.22**	**0.22**	**−0.05**	**0.11**	**−0.05**	**0.05**	**0.21**	**−0.19**	0.00	−0.02	**0.02**	−0.00	**−0.07**	**0.03**		
DARISK	**0.05**	0.01	**0.05**	**0.03**	−0.00	0.02	**0.06**	−0.02	**0.07**	**0.02**	**−0.04**	**−0.03**	**0.12**	**−0.05**	**−0.25**	**0.08**	**0.11**	
INRISK	**0.20**	**0.08**	**0.22**	**0.22**	**−0.05**	**0.11**	**−0.05**	**0.06**	**0.21**	**−0.19**	0.00	−0.02	0.02	0.00	**−0.05**	**0.03**	**0.10**	**0.05**

Notes: This table shows the Pearson correlation coefficients of the variables used in Eq. (1). Coefficients that are significant at the 5% level are shown in bold.

Table 4
H1—Goodwill impairments and modified opinions.

	Dependent variable = OPINION	
	(1)	(2)
IMPAIR	54.247***	21.644***
	(9.586)	(2.875)
LAGOP		3.423***
		(12.379)
COST		0.303
		(1.364)
BIG4		−0.223
		(−0.394)
HARD		−1.862***
		(−2.818)
LOSS		0.934***
		(2.660)
SP		0.976***
		(2.762)
OCF		−2.158
		(−1.584)
CAPINTEN		0.058*
		(1.768)
LNTA		−0.448***
		(−3.290)
AGE		0.042
		(0.235)
GROWTH		0.012
		(0.829)
SOE		−0.297
		(−1.184)
LEV		2.947***
		(5.764)
ROA		−6.443***
		(−2.736)
cons	−2.470***	0.711
	(−3.646)	(0.311)
Year	Yes	Yes
Industry	Yes	Yes
Obs.	8,504	8,504
Pseudo R^2	0.102	0.416

Robust z-statistics are given in brackets; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

in the previous period is positively related to that in the current period. Loss, firm age, leverage, and capital intensity are positively related to the probability of receiving a modified opinion. Firm size, profitability, auditor expertise, audit difficulty, and operating cash flows are negatively related to modified opinions. Overall, these results are consistent with our expectations.

4.2. Empirical analysis

Table 4 presents the results for H1. The independent variable *IMPAIR* is the ratio of goodwill impairments to total assets. The dependent variable *OPINION* equals 1 for modified opinions and unmodified opinions with explanatory paragraphs. In column (1), we find a statistically and economically significant and positive association between *IMPAIR* and *OPINION* without control variables. Similarly, the association is not altered in column (2), in which we add the control variables that have been documented in the literature as influencing audit opinions and goodwill impairments. When the amount of goodwill impairments increases by 1%, the marginal probability of receiving a modified opinion increases by 34.1%. Auditors perceive the

Table 5
Panel A H2—The mediating effect of VOL.

	(1) OPINION	(2) VOL	(3) OPINION
IMPAIR	18.897**	0.956***	18.467**
	(2.328)	(3.785)	(2.315)
VOL			0.880**
			(2.298)
LNTA	−0.525***	−0.026***	−0.454***
	(−3.448)	(−9.623)	(−2.842)
LOSS	0.904**	0.081***	0.975**
	(2.273)	(8.250)	(2.523)
LEV	2.763***	0.220***	2.318***
	(4.805)	(11.424)	(3.952)
ROA	−6.611**	0.054	−5.751**
	(−2.555)	(0.891)	(−2.382)
BIG4	−0.514	0.018***	−0.496
	(−0.760)	(2.842)	(−0.737)
AGE	−0.067	0.023***	−0.077
	(−0.273)	(6.907)	(−0.310)
GROWTH	0.010	−0.000	0.011
	(0.589)	(−0.230)	(0.674)
SOE	−0.258	0.001	−0.310
	(−0.910)	(0.335)	(−1.084)
LAGOP	3.454***		3.386***
	(11.039)		(10.936)
COST	0.418*		0.353
	(1.704)		(1.417)
HARD	−1.549**		−1.575**
	(−2.269)		(−2.302)
SP	0.950**		0.995**
	(2.436)		(2.527)
OCF	−0.852		−0.864
	(−0.527)		(−0.547)
CAPINTEN	0.030		0.027
	(0.773)		(0.692)
cons	1.217	0.497***	0.764
	(0.479)	(9.194)	(0.302)
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
Obs.	6,803	6,803	6,803
Pseudo R^2/ R^2	0.384	0.146	0.386
Sobel test			1.965**
Aroian test			1.917*
Goodman test			2.017**

For columns (1) and (3), robust z-statistics are given in brackets; for column (2), robust t-statistics are given in brackets; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Panel B H2—The mediating effects of DARISK and INRISK

	(1) OPINION	(2) DARISK	(3) OPINION	(4) INRISK	(5) OPINION
IMPAIR	18.897**	0.029**	24.996***	0.188	19.665**
	(2.328)	(2.256)	(2.928)	(0.430)	(2.424)
DARISK			0.382**		
			(2.477)		
INRISK					0.885**
					(2.256)
LNTA	−0.525***	−0.000	−0.469***	−0.030***	−0.456***

(continued on next page)

Table 5 (*continued*)

Panel B H2—The mediating effects of DARISK and INRISK

	(1) OPINION	(2) DARISK	(3) OPINION	(4) INRISK	(5) OPINION
	(−3.448)	(−0.242)	(−3.328)	(−5.326)	(−2.870)
LOSS	0.904**	0.003***	0.988***	0.027***	1.001**
	(2.273)	(6.801)	(2.814)	(3.251)	(2.553)
LEV	2.763***	0.003***	2.652***	0.197***	2.318***
	(4.805)	(4.498)	(5.787)	(5.772)	(3.978)
ROA	−6.611**	0.019***	−5.917***	−0.074	−5.447**
	(−2.555)	(5.725)	(−2.644)	(−1.144)	(−2.292)
BIG4	−0.514	−0.001***	−0.370	0.005	−0.504
	(−0.760)	(−3.882)	(−0.379)	(0.305)	(−0.737)
AGE	−0.067	−0.000	0.018	0.041***	−0.090
	(−0.273)	(−0.182)	(0.175)	(6.597)	(−0.330)
GROWTH	0.010	0.000***	0.015	−0.001	0.012
	(0.589)	(2.777)	(0.835)	(−1.643)	(0.666)
SOE	−0.258	−0.001***	−0.097	−0.008	−0.296
	(−0.910)	(−2.633)	(−1.155)	(−0.882)	(−1.075)
LAGOP	3.454***		3.567***		3.380***
	(11.039)		(12.267)		(10.715)
COST	0.418*		0.281		0.358
	(1.704)		(1.463)		(1.451)
HARD	−1.549**		−2.086***		−1.603**
	(−2.269)		(−2.829)		(−2.336)
SP	0.950**		1.008***		1.006**
	(2.436)		(2.908)		(2.555)
OCF	−0.852		−2.347*		−0.845
	(−0.527)		(−1.803)		(−0.541)
CAPINTEN	0.030		0.048		0.031
	(0.773)		(1.286)		(0.764)
cons	1.217	0.010***	1.233	0.593***	0.773
	(0.479)	(4.308)	(0.185)	(5.331)	(0.293)
Year	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes
Obs.	6,803	6,803	6,803	6,803	6,803
Pseudo R^2/ R^2	0.384	0.131	0.403	0.157	0.387
Sobel test			1.668*		0.423
Aroian test			1.598		0.392
Goodman test			1.748*		0.463

For columns (2) and (4), robust t-statistics are given in brackets; for columns (1), (3), and (5), robust z-statistics are given in brackets; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 6
Endogeneity—Propensity score matching (PSM).

Panel A Balancing test

Variable	Obs.	Unmatched	*M*		% reduct		*t*-test	
		Matched	Treated	Control	%bias	|bias|	*t*	$p > \|t\|$
LAGOP	8,445	U	0.031	0.017	9.4	91.8	4.76	0.000
		M	0.026	0.025	0.8		0.31	0.757
LOSS	8,445	U	0.105	0.052	19.5	96.6	9.86	0.000
		M	0.089	0.088	0.7		0.26	0.797
LNTA	8,445	U	22.328	22.323	7.6	81.2	3.67	0.000
		M	22.34	22.358	−1.4		−0.58	0.563
AGE	8,445	U	2.310	2.108	30.6	85.6	14.30	0.000
		M	2.302	2.332	−4.4		−1.91	0.056

(*continued on next page*)

Table 6 (*continued*)

Panel A Balancing test								
Variable	Obs.	Unmatched	*M*		% reduct		*t*-test	
		Matched	Treated	Control	%bias	|bias|	*t*	$p > \|t\|$
GROWTH	8,445	U	0.040	0.038	0.1	−4235.3	0.03	0.987
		M	0.019	-0.077	2.4		0.96	0.339
SOE	8,445	U	0.397	0.387	1.9	56.0	0.93	0.354
		M	0.399	0.403	−0.8		−0.35	0.728
LEV	8,445	U	0.457	0.443	6.6	80.1	3.15	0.002
		M	0.455	0.457	−1.3		−0.54	0.589
ROA	8,445	U	0.034	0.046	–23.7	98.3	−11.66	0.000
		M	0.037	0.037	−0.4		−0.17	0.862
COST	8,445	U	13.918	13.709	27.8	98.6	13.47	0.000
		M	13.91	13.913	−0.4		−0.15	0.878
BIG4	8,445	U	0.077	0.057	8.9	92.0	4.38	0.000
		M	0.078	0.077	0.7		0.27	0.785
HARD	8,445	U	0.267	0.271	−2.0	−40.5	−0.97	0.331
		M	0.268	0.263	2.9		1.17	0.241
SP	8,445	U	0.042	0.039	1.8	−9.3	0.86	0.389
		M	0.043	0.046	−2.0		−0.77	0.443
OCF	8,445	U	0.042	0.043	−1.5	3.9	−0.71	0.475
		M	0.043	0.044	−1.4		−0.59	0.555
CAPINTEN	8,445	U	2.604	2.480	5.5	89.8	2.73	0.006
		M	2.577	2.565	0.6		0.23	0.820

Panel B PSM	
	OPINION
IMPAIR	25.560***
	(3.025)
cons	1.093
	(0.401)
Control variables	Yes
Year	Yes
Industry	Yes
Obs.	5,328
Pseudo R^2	0.422

Robust z-statistics are given in brackets; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

goodwill impairments of clients as a signal of information risks and are concerned about the quality of their financial reports. Hence, they express these concerns in the form of modified opinions to avoid reputational damage or litigations. Consistent with our expectations, we find that firms are more likely to receive modified opinions when they are smaller, received a modified opinion in the previous year, post a loss or small profit, or have higher leverage ratios or lower returns. Nonetheless, auditors may put more effort into auditing clients with more accounts receivable and inventory on hand, resulting in a negative relationship between *OPINION* and *HARD*.

In Table 5, Panel A shows the results from testing the mediating effect of total information risks. First, goodwill impairments are significantly and positively related to the probability of receiving a modified opinion, as shown in column (1). Second, there is a significant and positive relationship between goodwill impairments and total information risks (*VOL*) in column (2). Third, *VOL* is positively related to the probability of receiving a modified opinion with the presence of goodwill impairments, as reported in column (3). Last, the Z-statistic of the Sobel test is significant at the 5% level, indicating that total information risks have a mediating effect.

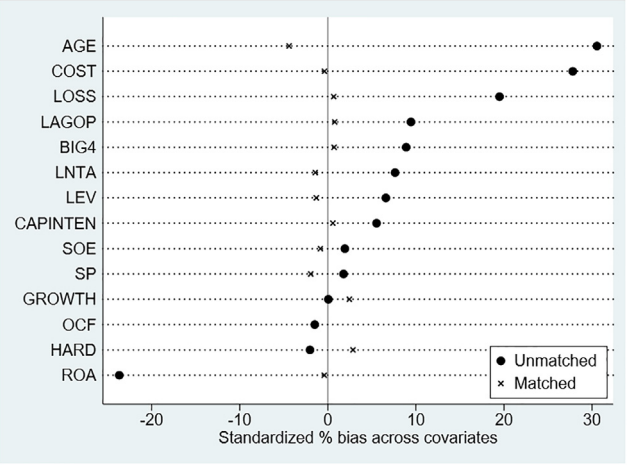

Fig. 4. Standardized bias of covariates.

Table 7
Endogeneity—Instrumental variable.

	First stage regression (1) Dependent variable = IMPAIR	Second stage regression (2) Dependent variable = OPINION
IMPAIR		4.958**
		(2.278)
LAGOP	0.004***	0.426***
	(7.854)	(12.554)
LOSS	0.003***	0.049***
	(8.303)	(3.898)
LNTA	−0.001***	−0.009***
	(−11.467)	(−2.600)
AGE	0.001***	−0.004
	(7.012)	(−1.480)
GROWTH	−0.000	0.001*
	(−1.439)	(1.907)
SOE	−0.001***	0.001
	(−5.434)	(0.198)
LEV	−0.002***	0.089***
	(−4.023)	(6.184)
ROA	−0.018***	−0.066
	(−8.948)	(−0.835)
COST	0.001***	0.001
	(9.173)	(0.314)
BIG4	−0.000	0.004
	(−0.193)	(0.833)
HARD	−0.000	−0.043***
	(−0.616)	(−4.184)
SP	−0.000	0.016*
	(−1.232)	(1.698)
OCF	0.004***	−0.042
	(4.019)	(−1.360)
CAPINTEN	0.000***	0.002*
	(3.572)	(1.859)
IV	0.004***	
	(8.342)	
cons	0.007***	0.160***

(*continued on next page*)

Table 7 (*continued*)

	First stage regression (1) Dependent variable = IMPAIR	Second stage regression (2) Dependent variable = OPINION
	(4.156)	(4.558)
Year	Yes	Yes
Industry	Yes	Yes
Obs.	8,504	8,504
Pseudo R^2/R^2	0.089	0.251
Kleibergen–Paap F statistic	32.098	

For column (1), robust t-statistics are given in brackets; for column (2), robust z-statistics are given in brackets; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 8
Robustness—Alternative measures.

	(1) OPINION	(2) OPINION	(3) OPINION2
GISALES	5.251**		
	(2.119)		
GIE		11.876***	
		(3.287)	
IMPAIR			20.351**
			(2.198)
cons	Yes	Yes	Yes
Control variables	Yes	Yes	Yes
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
Obs.	8,504	8,504	8,504
Pseudo R^2	0.414	0.417	0.343

Robust z-statistics are given in brackets; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 9
Robustness—Material impairments.

	OPINION
IMPAIR	30.466***
	(2.715)
cons	−6.910
	(−1.424)
Control variables	Yes
Year	Yes
Industry	Yes
Obs.	1,041
Pseudo R^2	0.495

Robust z-statistics are given in brackets; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Panel B shows the results from testing the mediating effects of information risks related to earnings management and to economic fundamentals. The results in columns (1)–(3) imply that information risks related to earnings management (*DARISK*) play a mediating role. However, we find a positive but non-significant association between impairments and information risks related to economic fundamentals (*INRISK*) in column (4)

Table 10
Robustness—Mediating effects.

Panel A Alternative measure of performance volatility

	(1) OPINION	(2) DARISK2	(3) OPINION	(4) INRISK2	(5) OPINION
IMPAIR	21.645***	0.018***	23.454***	0.317***	18.483**
	(2.875)	(3.857)	(2.763)	(3.076)	(2.756)
DARISK2			34.512**		
			(2.380)		
INRISK2					0.856**
					(2.418)
cons	0.715	0.006***	0.160	0.237***	0.103
	(0.313)	(8.033)	(0.071)	(4.635)	(0.046)
Control variables	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes
Obs.	6,852	6,852	6,852	6,852	6,852
Pseudo R^2/R^2	0.416	0.128	0.406	0.078	0.386
Sobel test			2.026**		1.901*
Aroian test			1.978**		1.842*
Goodman test			2.077**		1.966*

For columns (2) and (4), robust t-statistics are given in brackets; for columns (1), (3), and (5), robust z-statistics are given in brackets; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Panel B Alternative measures of information risks

	(1) OPINION	(2) INNATEAQ	(3) OPINION	(4) DISCAQ	(5) OPINION
IMPAIR	21.374***	1.092	26.116**	3.116**	27.646**
	(2.735)	(0.361)	(2.098)	(2.324)	(2.061)
INNATEAQ			0.060		
			(0.312)		
DISCAQ					0.106**
					(2.452)
cons	0.633	1.732***	0.129	−1.144***	0.535
	(0.273)	(4.224)	(0.146)	(−3.540)	(0.176)
Control variables	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes
Obs.	5,062	5,062	5,062	5,062	5,062
Pseudo R^2/ R^2	0.436	0.065	0.511	0.172	0.507
Sobel test			0.236		1.687*
Aroian test			0.102		1.617
Goodman test					1.766*

For columns (2) and (4), robust t-statistics are given in brackets; for columns (1), (3), and (5), robust z-statistics are given in brackets; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

and a non-significant Z-statistic of the Sobel test in column (5).[1] Thus, the risks related to economic fundamentals are not a mediator. These findings may indicate that impairment does not represent the genuine reaction of clients to an economic downturn or reflect poor performance after an acquisition. Rather, goodwill is impaired due to managerial incentives to manipulate earnings. Earnings management increases the risk of

[1] We regress economic fundamental risks on material goodwill impairments (i.e., goodwill impairments that are greater than 0.5% of sales revenue). The untabulated results show a significant and positive association between material goodwill impairments and all three measures of economic fundamental risks (i.e., *INRISK*, *INRISK2*, and *INNATE*), providing evidence that a larger amount of goodwill impairments reflects higher information risks related to economic fundamentals.

Table 11
Robustness—Control for impairments in the prior year.

OPINION	(1)	(2)
IMPAIR		22.336**
		(2.353)
LGI	8.600	−1.986
	(0.916)	(−0.195)
cons	1.439	1.230
	(0.564)	(0.467)
Control variables	Yes	Yes
Year	Yes	Yes
Industry	Yes	Yes
Obs.	7,200	7,200
Pseudo R^2	0.416	0.420

Robust z-statistics are given in brackets; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 12
Robustness—Multicollinearity.

OPINION	(1)	(2)
IMPAIR	21.644***	21.644***
	(2.875)	(2.875)
LNTA	−0.448***	
	(−3.290)	
AGE	0.042	
	(0.235)	
LEV	2.947***	
	(5.764)	
COST	0.303	
	(1.364)	
LNTASD		−0.565***
		(−3.290)
AGESD		0.029
		(0.235)
LEVSD		0.608***
		(5.764)
COSTSD		0.228
		(1.364)
Control variables	Yes	Yes
Year	Yes	Yes
Industry	Yes	Yes
Obs.	8,504	8,504
Pseudo R^2	0.416	0.416

Robust z-statistics are given in brackets; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

material misstatements in financial reports, which may result in unreliable information that misleads investors. Hence, auditors tend to issue modified opinions to communicate their concerns about financial reporting quality. As for risks related to economic fundamentals, auditors will not issue a modified opinion if they are satisfied with the going concern basis of accounting for the relevant period.

Overall, we posit that (1) the association between goodwill impairments and modified opinions is driven primarily by risks related to earnings management; and (2) in auditing goodwill impairments, auditors focus more on "procedural justice" (whether the client engages in earnings management, such that the financial

information is unreliable and misstated) than on "substantive justice" (whether there are systemic risks associated with the industry's operating environment or macroeconomic conditions).

4.3. Endogeneity

The association between goodwill impairments and modified audit opinions has a potential endogeneity issue, which implies that regression (1) could suffer from reverse causality. Unobserved audit characteristics may affect impairment decisions. We use two approaches to address this concern. First, we use propensity score matching (one-to-one nearest neighbor matching with a caliper of 0.05 and no replacement) to match impaired firms with unimpaired firms based on the control variables in model (1). The standardized biases of all of the covariates are significantly reduced to 4% after matching, and the *t*-test results do not reject the hypothesis that the treatment and control groups are systemically indifferent (see Table 6, Panel A and Fig. 4). We then keep the matched sample (i.e., *_weight*==1) and run model (1) again. In doing so, we mitigate noise from other factors and ensure that differences in outcomes are primarily driven by variations in the amount of goodwill impairments. In Table 6, Panel B shows the results of model (1) using the matched sample. The significant and positive relationship between the dependent and independent variables still exists.

Second, we use the current impairment recognized by peer firms within the same industry as the instrumental variable (IV). On the one hand, peer firms' goodwill impairments may indicate the economic environment or managerial incentives at the industry level, and consequently affect the amount of goodwill impairments recorded by other industry peers (satisfying the inclusion criterion). On the other hand, there is little evidence that the impairment of peer firms is directly related to modified audit opinions of other industry peers in the same financial year (satisfying the exclusion criterion). The results of our IV regression are reported in Table 7. There is a significant and positive relationship between the IV and goodwill impairments in the first-stage regression. The Kleibergen–Paap Wald F-statistic test for a weak instrument reveals an F-statistic of 32, which is much greater than 10 (Stock and Yogo, 2005). Thus, we believe that the IV is valid. We still find a significant and positive relationship between the instrumented impairments and modified opinions in the second-stage regression. Overall, the IV regression confirms the robustness of the association between goodwill impairments and the probability of receiving a modified audit opinion after controlling for endogeneity.

4.4. Robustness tests

First, we use alternative measures for the dependent and independent variables. In particular, we replace the independent variable *IMPAIR* with *GISALES* (*GIE*), the ratio of goodwill impairments to sales revenue (total shareholders' equity). Columns (1) and (2) of Table 8 report the results of Eq. (1) using the alternative

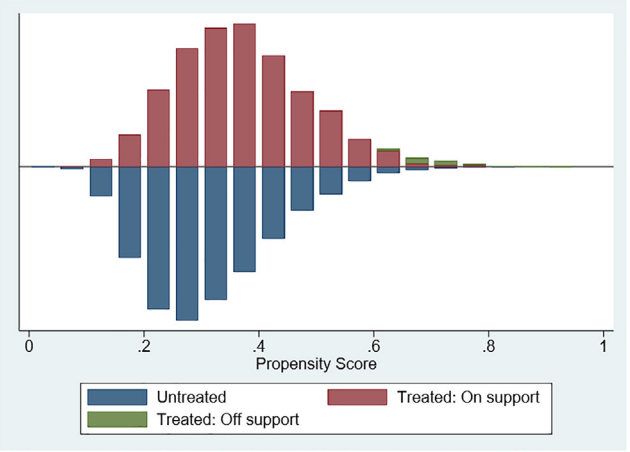

Fig. 5. Propensity scores.

independent variables. The significant and positive association between impairments and modified opinions still exists. We also replace the dependent variable *OPINION* with *OPINION2*, which equals 1 for unmodified opinions, 2 for unmodified opinions with explanatory paragraphs, 3 for modified opinions, and 4 for adverse opinions or disclaimers of opinions. Using the ordered probit model (1), we find a significant and negative average marginal effect when unmodified opinions are issued, and positive marginal effects in the other scenarios (unreported). In general, the selection of proxies does not drive our results.

Following Ayres et al. (2019), we focus on goodwill impairments that are greater than 0.5% of sales revenue. Therefore, the number of observations is greatly reduced. In Table 9, the significant and positive coefficient of *IMPAIR* implies that auditors are more conservative in issuing unmodified opinions when clients record a significant amount of goodwill impairments.

In the baseline regression, we measure the variations in firm performance across different accounting periods (vertical comparison) rather than the volatility between firms (horizontal comparison). Here, we calculate the performance volatility as the 5-year standard deviation of return on assets (*SDROA*) from *t-4* to *t* (Adams et al., 2005; Cheng, 2008; Quan and Wu, 2010). Again, we perform the three-step process to test the mediating effects. We provide the results for the mediating effects of earnings management risks in columns (2) and (3) of Table 10, Panel A, which are in line with the results reported in Table 5.

Table 13
Cross-sectional tests.

Panel A The auditor–client relationship

	Dependent variable = OPINION					
	(1) Mismatch = 0	(2) Mismatch = 1	(3) Misdown = 0	(4) Misdown = 1	(5) Misup = 0	(6) Misup = 1
IMPAIR	21.968*	17.824	26.334***	57.446	15.427	23.886**
	(1.832)	(1.548)	(3.369)	(1.576)	(1.280)	(2.167)
cons	−0.091	0.042	−0.877	4.821	−0.839	0.244
	(−0.023)	(0.015)	(−0.357)	(0.762)	(−0.222)	(0.082)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2,865	4,472	6,180	1,157	2,875	4,462
Pseudo R^2	0.526	0.423	0.415	0.634	0.511	0.424
Chi^2		2.84*		10.26***		3.29*

Robust z-statistics are given in brackets; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Panel B Auditor industry expertise

	Dependent variable = OPINION	
	(1) IMSD = 1	(2) IMSD = 0
IMPAIR	29.470**	19.867
	(2.204)	(0.432)
cons	2.393	−4.940
	(0.207)	(−1.279)
Control variables	Yes	Yes
Year	Yes	Yes
Industry	Yes	Yes
Obs.	2,817	4,520
Pseudo R^2	0.336	0.560
Chi^2		3.03*

Robust z-statistics are given in brackets; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

We address the concern that the mediating effects documented in Table 5 are driven by the selection of specific measures by replacing the proxies for earnings management risks and economic fundamental risks with those used in Francis et al. (2005). First, we calculate information risks (accruals quality, *AQ*) as the standard deviation of the residual value of the DD model (Dechow et al., 1995) from year *t-4* to year *t*. Second, we use the following specification to compute the information risks related to economic fundamentals and earnings management:

$$AQ_{i,t} = \alpha + \beta_1 LNTA_{i,t} + \beta_2 \sigma(OCF)_{i,t} + \beta_3 \sigma(SALE)_{i,t} + \beta_4 OperCycle_{i,t} + \beta_5 NegEarn_{i,t} + \varepsilon_{i,t}$$

The predicted value of *AQ* represents the information risks related to economic fundamentals (*INNATEAQ*). The residual value is the discretionary portion of information risks (*DISCAQ*). Appendix A1 includes the definitions of these variables. Finally, we repeat the three steps described in Section 3.2 to examine the mediating role of *INNATEAQ* and *DISCAQ*. In Table 10, Panel B, we find results similar to those reported in Table 5. Although both types of information risk are positively associated with goodwill impairment, only information risks related to earnings management play a mediating role (see columns (4) and (5)).[2]

We are interested in the time-lag effects of impairments (see Table 11); that is, whether lagged goodwill impairments (*LGI*) affect current audit opinions. First, we replace *IMPAIR* with *LGI* in Eq. (1). Second, we include *LGI* as a control variable. In both cases, the main results remain unchanged. Therefore, the exclusion of lagged impairments from Eq. (1) does not alter the results in Table 4.

In the correlation coefficient matrix, several variables exhibit significant correlations with almost all of the other variables. Therefore, we conduct a collinearity diagnosis. First, we calculate the variance inflation factor (VIF) of each variable in Eq. (1). We find that 4 out of 14 variables have a VIF over 10 (i.e., *LNTA*, *AGE*, *LEV*, and *COST*). Second, we standardize these variables and run model (1) using the standardized variables. Column (1) of Table 12 shows the results of the baseline regression. The documented association is not altered by the standardization of the variables, as shown in column (2). Last, we consider the monitoring role that corporate governance plays in reducing earnings management when making impairment decisions (Ye et al., 2016). In an untabulated test, we control for the ratio of independent directors (*IND*), shares owned by the largest shareholder (*HOLD*), CEO turnover (*LEAVE*), and duality of CEO and chairperson (*DUAL*) in Eq. (1). The results remain the same (see Fig. 5).

5. Further discussion

5.1. Cross-sectional tests

Above, we examined the association between goodwill impairments and the probability of receiving a modified audit opinion, and the mechanisms underlying this association. In this section, we explore how the auditor–client relationship and auditor industry expertise affect the positive association between impairments and modified opinions.

The auditor–client pair should be stable because the clients of large audit firms have significantly different characteristics from those of small audit firms (Bills, 2012). Nonetheless, the relationship is more dynamic in reality. The audit–client pair may be reconstructed if audit firms actively change their targeted clients during certain phases of development, or if clients change auditors to meet their own needs (Johnson and Lys, 1990). An upward clientele-mismatch occurs when a client with characteristics that suit a small audit firm employs a large audit firm. A downward clientele-mismatch occurs when a client with characteristics that suit a large audit firm employs a small audit firm. The second clientele-mismatch may influence whether auditors are able (or willing) to identify opportunistic earnings manipulation and objectively report financial misstatements (Watts and Zimmerman, 1983). Moreover, a downward mismatch is related to lower audit fees, higher earnings management, and lower accounting conservatism (Dong et al., 2018; Wang et al., 2020). We use the following model to construct the clientele-mismatch variable (Shu, 2000; Wang et al., 2020):

[2] We also use the three-step method to test the mediating effect of total information risks (i.e., *SDROA* and *AQ*). The untabulated results are similar to those reported in Table 5, Panel A.

$$Big10 = \alpha + \beta_1 LNTA_{i,t} + \beta_2 LEV_{i,t} + \beta_3 ATURN_{i,t} + \beta_4 CR_{i,t} + \beta_5 ROA_{i,t} + \sum IND + \sum YEAR + \varepsilon,$$

where *Big10* equals 1 if the client is audited by a Big 10 audit firm, and 0 otherwise (the list of Big 10 audit firms can be found on the website of the Chinese Institute of Certified Public Accountants), *ATURN* is the turnover of total assets, and *CR* is the current ratio. The fitted value of *Big10* represents the probability that a client will employ a Big 10 audit firm (*Prob10*). We then calculate the optimal cutoff value that minimizes the sample misclassification rates for each year. Last, we define the related variables as follows:

Big10	*Prob10*	Mismatch	Misup (upward mismatch)	Misdown (downward mismatch)
1	<= cutoff value	1	1	0
0	> cutoff value	1	0	1
1	> cutoff value	0	0	0
0	<= cutoff value	0	0	0

The results are shown in Table 13, Panel A. A significant and positive association between impairments and modified audit opinions exists when there is (a) no mismatch between client and auditor (column (1)), (b) no downward mismatch (column (3)), or (c) an upward mismatch (column (6)). In these circumstances, the quality of the audit is higher. Auditors are more capable of detecting misstatements from earnings management and will issue appropriate opinions to maintain their reputation.

Auditors with industry expertise are perceived to have a better understanding of their client's operations and industry environment, to possess more professional skills, and to provide higher-quality audit services compared with non-experts (Fan et al., 2013; Zhao and Ni, 2020). We follow Krishnan (2003) and measure an auditor's industry market share (*IMS*) as the ratio of the total sales revenue of the clients of audit firm i in industry k to the total sales revenue of all clients in industry k. We define audit firm i as an expert in industry k ($IMSD = 1$) if its *IMS* is higher than 10%. Panel B shows the comparative results of $IMSD = 1$ and $IMSD = 0$. Consistently, auditors are more likely to issue a modified opinion if they are concerned with potential material misstatements in financial reports when they are an expert in the industry (column (1)). That is, audit firms with industry expertise are better at providing high-quality information and external monitoring for financial report users.

5.2. Further analysis

One previous study documents a positive association between differences in impairment decisions and auditors' dismissals (Ayres et al., 2019). Likewise, we consider whether these differences in impairment decisions affect the type of audit opinion that clients receive. Accordingly, we measure the appropriateness of the existence of goodwill impairments (*DIFF*) as the difference between actual impairment decisions and the predicted probability of impairment ($DIFF = DUMMY - IMPAIRS$). Here, *IMPAIRS* is the predicted value of the dependent variable of the following equation:

$$IMPAIRS_{it} = \beta_0 + \beta_1 LNMV_{it} + \beta_2 RETVOL_{it} + \beta_3 LOSS_{it} + \beta_4 LEV_{it} + \beta_5 ROA_{it} + \beta_6 EBITDA_{it} + \beta_7 RETURN_{it} + \beta_8 BIG4_{it} + \beta_9 RESTRU_{it} + \beta_{10} ACQ_{it} + INDUSTRY\_FE + YEAR\_FE + \varepsilon$$

The dependent variable *IMPAIRS* equals 1 if a client records goodwill impairments in the current period, and 0 otherwise (Ayres et al., 2019). The independent variables (Beatty and Weber, 2006; Hayn and Hughes, 2006; Gu and Lev, 2011; Ramanna and Watts, 2012) include the market value of equity (*LNMV*), volatility of stock returns (*RETVOL*), annual stock return (*RETURN*), earnings (*EBITDA*), restructuring costs (*RESTRU*), and acquisition (*ACQ*). Accordingly, *DIFF* is a continuous variable that takes a value between −1 and 1, where positive values indicate impairment decisions that are less favorable to clients (e.g., recognize an impairment that could not be recorded). Last, we regress *OPINION* on *DIFF* using Eq. (1). Appendix A1 gives the definitions of the variables.

Table 14
Panel A Predicted probability of impairment.

	IMPAIRS
LNMV	−0.036
	(−0.575)
LOSS	0.408***
	(3.126)
LEV	0.173
	(0.695)
ROA	−4.089***
	(−3.734)
ACQ	−0.254***
	(−3.640)
EBITDA	0.779
	(1.235)
RETURN	−0.038
	(−0.766)
RETVOL	−0.947*
	(−1.702)
BIG4	0.576***
	(2.825)
RESTRU	−0.192***
	(−3.253)
cons	−0.418
	(−0.305)
Year	Yes
Industry	Yes
Obs.	8,504
Pseudo R^2	0.058

Robust z-statistics are given in brackets; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.
Panel B Further analysis

	Amount of goodwill impairments		Appropriateness of their existence
	(1)	(2)	(3)
OPINION	HGI = 0	HGI = 1	
DIFF			0.210
			(1.104)
IMPAIR	54.088	39.196***	
	(0.396)	(3.640)	
LAGOP	4.341***	2.238***	3.406***
	(4.277)	(4.327)	(12.420)
LOSS	1.882**	0.188	1.039***
	(2.028)	(0.358)	(4.430)
LNTA	−0.251	−0.778***	−0.438***
	(−0.903)	(−2.718)	(−3.268)
AGE	1.110	−0.709*	−0.033
	(1.408)	(−1.827)	(−0.189)
GROWTH	0.003	−0.039	0.008
	(0.073)	(−1.516)	(0.567)
SOE	−2.060***	0.665	−0.392
	(−2.897)	(1.559)	(−1.604)
LEV	4.333***	5.804***	2.635***
	(2.591)	(5.396)	(4.993)
ROA	−7.762	−6.018*	−8.362***
	(−1.014)	(−1.765)	(−4.737)
COST	−0.196	1.255**	0.290
	(−0.356)	(2.439)	(1.332)
BIG4	0.056	−0.216	−0.200
	(0.059)	(−0.291)	(−0.352)

(*continued on next page*)

Table 14 (*continued*)

Panel B Further analysis			
	Amount of goodwill impairments		Appropriateness of their existence
	(1)	(2)	(3)
HARD	−4.166**	−0.422	−1.615**
	(−1.986)	(−0.451)	(−2.378)
SP	0.977	1.146	0.441
	(2.147)	(1.628)	(1.293)
OCF	−3.646	1.563	−1.488
	(−1.031)	(0.544)	(−1.094)
CAPINTEN	0.036	0.165***	0.049
	(0.247)	(2.586)	(1.511)
cons	0.501	−5.218	0.733
	(0.081)	(−1.089)	(0.333)
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
Obs.	990	1,831	8,504
Pseudo R^2	0.586	0.511	0.412
Chi^2		3.43*	

Robust z-statistics are given in brackets; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Moreover, we distinguish auditors' reaction to the amount of goodwill impairments from their reaction to the appropriateness of the mere existence of goodwill impairments by running model (1) in groups with above-median ($HGI = 1$) and below-median ($HGI = 0$) impairments. In particular, we drop firms with zero impairments and then divide the remaining observations into subgroups according to the industry median.

Table 14 shows the results of the analysis. First, goodwill impairments are significantly and positively associated with the probability of receiving a modified opinion only when the impairments of clients are greater than the industry median (see column (2), Panel B), which is consistent with the results in Table 4. Second, we find a positive but non-significant association between impairment decision differences and the probability of receiving a modified opinion in column (3), Panel B. In an untabulated test, we divide the decision differences into those that are more favorable to clients ($DIFF = [-1, 0]$) and those that are more favorable to auditors ($DIFF = (0.1]$). Again, we do not find any significant association in these scenarios. In summary, we provide evidence that auditors are more sensitive to the amount of goodwill impairments than to the appropriateness of their mere existence. Disagreements between auditors and clients about impairment decisions may not be a major reason for the issuance of modified opinions.

6. Conclusions

Impairment accounting presents auditors with new challenges in applying professional skepticism to detect material misstatements in financial reports. In this study, we examine the relationship between goodwill impairments and modified opinions and the mechanisms underlying this association. This study enriches our understanding of auditors' reaction to information risks in the setting of goodwill auditing. Our results imply that auditors perceive goodwill impairment as a signal of information risks and focus more on "procedural justice" (whether the client engages in earnings management) than on "substantive justice" (whether there are systemic risks related to economic fundamentals). Unlike prior studies, our study examines the relationship between goodwill impairments and modified audit opinions from the perspective of investors. Investors' reliance on auditors for assurance of reporting quality places external pressure on auditors during their audit of goodwill impairments, and auditors face damage to their reputation or litigation if they fail to identify risks and issue inappropriate opinions. This study also has important implications for auditors and investors. Auditors should have a comprehensive understanding of the industry environment and the historical performance of their clients prior to the audit, and also maintain a high level of professional skepticism in auditing goodwill, so that audit resources can be efficiently used to improve audit quality. Investors should be more prudent in relying on audit opinions to mitigate mispricing problems. A limitation of this research is that

we do not explore the negotiations between auditors and clients regarding goodwill impairments before the issuance of audit opinions. Future research could provide more analysis in this area.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgement

For helpful comments, we are grateful to Qingyuan Li, Mengmeng Guo, we also thank Siming Yu for comments on revisions. The views expressed herein are those of the authors and do not necessarily reflect the views of Economics and Management school of Wuhan University.

Appendix. See Tables A1–A4.

Table A1
Variable definitions.

Dependent variables	
OPINION	Indicator variable, which equals 1 for modified opinions and unmodified opinions with explanatory paragraphs, and 0 otherwise.
OPINION2	Indicator variable, which equals 1 for unmodified opinions, 2 for unmodified opinions with explanatory paragraphs, 3 for modified opinions, and 4 for adverse opinions or disclaimers of opinions.
AQ	Alternative measure of information risks, calculated as the 5-year (*t-4* to *t*) standard deviation of the residuals from the DD model (Dechow et al., 1995).
SDROA	Alternative measure of performance volatility, calculated as the 5-year standard deviation of return on assets from year *t-4* to year *t*.
VOL	Performance volatility, measured as the 3-year standard deviation of return on equity from year *t-2* to year *t*.
Independent variables	
DA	Proxy for earnings management, which is computed using the formula of Kothari et al. (2005): $\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{i,t-1}} + \alpha_2\left[\frac{\Delta REV_{i,t}}{A_{i,t-1}}\right] + \alpha_3 \frac{PPE_{i,t}}{A_{i,t-1}} + \alpha_4 \frac{ROA_{i,t}}{A_{i,t-1}} + \varepsilon$ $A_i$represents a firm's total assets in year *t-1*; ΔREV_irepresents its operating revenue in year *t*; PPE_i is the amount of current property, plant, and equipment; andROA_i is its return on assets in year *t*.
DARISK	Risks related to earnings management, measured as $\beta_1 DA_{it}$ using the following equation: $VOL_{it} = \beta_0 + \beta_1 DA_{it} + \beta_2 LEV_{it} + \beta_3 GROWTH_{it} + \beta_4 OCF_{it} + \beta_5 LNTA_{it} + \beta_6 SOE_{it} + \beta_7 HOLD_{it} + \beta_8 IND_{it} + \beta_9 LEAVE_{it} + \beta_{10} DUAL_{it} + INDUSTRY\_FE + YEAR\_FE + \varepsilon$
DARISK2	Alternative proxy for risks related to earnings management in which information risks are calculated as the 5-year standard deviation of return on assets from year *t-4* to year *t*.
DIFF	The difference between actual impairment decisions ($DUMMY$) and the predicted probability of impairment ($IMPAIRS$). $IMPAIRS$ is the fitted value of the dependent variable of the following equation: $IMPAIRS_{it} = \beta_0 + \beta_1 LNMV + \beta_2 LOSS + \beta_3 LEV + \beta_4 ROA + \beta_5 ACQ + \beta_6 EBITDA + \beta_7 RETRUN + \beta_8 RETVOL + \beta_9 BIG4 + \beta_{10} RESTRU + INDUSTRY\_FE + YEAR\_FE + \varepsilon$

(*continued on next page*)

Table A1 (*continued*)

DISAQ	Alternative proxy for risks related to earnings management, calculated as the residuals of the following model: $AQ_{it} = \beta_0 + \beta_1 LNTA$ $+\beta_2\sigma(\text{OCF})$ $+\beta_3\sigma(\text{SALE}) + \beta_4 OperCycle$ $+\beta_5 NegEarn + \varepsilon$
DUMMY	Equals 1 if a goodwill impairment is recorded in year *t*, and 0 otherwise.
GIE	Alternative measure of goodwill impairments, calculated as the ratio of goodwill impairments to total shareholders' equity.
GISALES	Alternative measure of goodwill impairments, calculated as the ratio of goodwill impairments to sales revenue.
IMPAIR	Ratio of goodwill impairments to total assets at year end.
INRISK	Risks related to economic fundamentals, measured as the difference between performance volatility (*VOL*) and risks related to earnings management (*DARISK*).
INRISK2	Alternative proxy for risks related to economic fundamentals, in which information risks are calculated as the 5-year standard deviation of return on assets from year *t-4* to year *t*.
INNATEAQ	Alternative proxy for risks related to economic fundamentals, calculated as the predicted value of the dependent variable of the following model: $AQ_{it} = \beta_0 + \beta_1 LNTA + \beta_2\sigma$ $(\text{OCF}) + \beta_3\sigma(\text{SALE}) + \beta_4 OperCycle$ $+\beta_5 NegEarn + \varepsilon$
LGI	Goodwill impairments recognized in year *t-1*.
Control variables	
ACQ	Indicator variable, which equals 1 if the firm performed an acquisition to increase goodwill during the current year, and 0 otherwise.
AGE	Proxy for firm age, calculated as the natural logarithm of 1 plus the current year less the first observable year available in the CSMAR database.
BIG4	Equals 1 if the firm is audited by a Big 4 auditor, and 0 otherwise.
CAPEX	Capital expenditures divided by sales revenue in the prior year.
CAPINTEN	Capital concentration, calculated as the ratio of total assets to operating income.
COST	The natural logarithm of audit fees in year *t*.
DUAL	Equals 1 if the CEO and chair of the board are the same person, and 0 otherwise.
EBITDA	The ratio of the change in earnings before interest, taxes, depreciation, and amortization to the market value of equity.
GROWTH	Sales growth rate, measured as the change in sales revenue from year *t-1* to year *t* divided by sales revenue in year *t-1*.
HARD	Difficulty of audit work, measured as the sum of net accounts receivable and net inventory divided by total assets.
HOLD	The proportion of shares owned by the largest shareholder.
IND	Board independence, measured as the number of independent directors divided by the total number of directors.
LAGOP	Audit opinion received in year *t-1*. Equals 1 for modified opinions and unmodified opinions with explanatory paragraphs, and 0 otherwise.
LEAVE	Equals 1 if the CEO or chair of the board leave the firm during the year, and 0 otherwise.
LEV	Ratio of total debt to total assets at year end.
LNMV	Natural logarithm of the firm's market value of equity.
LNTA	Firm size, measured as the natural logarithm of total assets in year *t*.
LOSS	Equals 1 for firms with negative profit before extraordinary items, and 0 otherwise.
OCF	Ratio of net cash flow from operating activities to beginning total assets.
RESTRU	Equals 1 if restructuring costs are incurred during the current year, and 0 otherwise.
RETURN	Annual stock return when considering cash dividends and re-investment.
RETVOL	The standard deviation of the firm's stock return over the current year.
ROA	Return on assets, calculated as net income divided by total assets.
SOE	Equals 1 for state-owned enterprises, and 0 for non-state-owned enterprises.
SP	Equals 1 if the firm has a return on equity between 0 and 1%, and 0 otherwise.
σ(OCF)	The standard deviation of cash flows from operating activities from year *t-9* to year *t*.
σ(SALE)	The standard deviation of sales revenue from year *t-9* to year *t*.
OperCycle	The natural logarithm of firm *i*'s operating cycle.
NegEarn	The number of years in the past 10 years that firm *i* reported a loss.

Table A2
The industry distribution of impaired firms.

	Industry (number of impaired firms)				
Rank	1	2	3	4	5
2007	Pharmaceuticals (**7**)	Retail (**5**)	Food processing (**5**)	Others **(4)**	Real estate **(4)**
2008	Pharmaceuticals (**10**)	Telecom & network equipment (**9**)	Others (**7**)	Retail (**9**)	Real estate (**17**)
2009	Pharmaceuticals (**13**)	Telecom & network equipment (**12**)	Retail (**9**)	Real estate (**9**)	Others (**9**)
2010	Telecom & network equipment (**16**)	Real estate (**16**)	Pharmaceuticals (**15**)	Retail (**12**)	Food processing (**9**)
2011	Telecom & network equipment (**20**)	Pharmaceuticals (**17**)	Real estate (**17**)	Chemical raw materials & chemical products manufacturing (**14**)	Retail (**13**)
2012	Telecom & network equipment (**29**)	Chemical raw materials & chemical products manufacturing (**19**)	Pharmaceuticals (**17**)	Retail (**16**)	Software & information technology services (**16**)
2013	Telecom & network equipment (**35**)	Pharmaceuticals (**25**)	Software & information technology services (**22**)	Chemical raw materials & chemical products manufacturing (**19**)	Retail (**18**)
2014	Telecom & network equipment (**33**)	Pharmaceuticals (**32**)	Electrical machinery & equipment manufacturing (**23**)	Chemical raw materials & chemical products manufacturing (**22**)	Software & information technology services (**21**)
2015	Telecom & network equipment (**42**)	Pharmaceuticals (**39**)	Electrical machinery & equipment manufacturing (**42**)	Software & information technology services (**33**)	Chemical raw materials & chemical products manufacturing (**26**)
2016	Telecom & network equipment (**62**)	Pharmaceuticals (**42**)	Electrical machinery & equipment manufacturing (**42**)	Special equipment manufacturing (**38**)	Software & information technology services (**27**)
2017	Telecom & network equipment (**80**)	Electrical machinery & equipment manufacturing (**57**)	Special equipment manufacturing (**55**)	Pharmaceuticals (**54**)	Software & information technology services (**54**)

Notes: This table shows the industry distribution of impaired firms. The first five industries with the most impaired firms are listed in descending order. The bold number in brackets represents the number of impaired firms in the industry. Between 2007 and 2017, the pharmaceuticals, telecom, and network equipment industries had the largest number of impaired firms, followed by the real estate, chemical raw materials, and electrical machinery manufacturing industries.

Table A3
The amount of goodwill impairments.

Year	2007		2008		2009		2010		2011		2012	
Rank	Industry	Impairments	Industry	Impairments	Industry	Impairments	Industry	Impairments	Industry	Impairments	Industry	Impairments
1	Alcohol, beverage & tea manufacturing	199,626,368 (**45%**)	Air transportation	642,828,032 (**65%**)	Petroleum & gas extraction	1,391,000,064 (**7%**)	Real estate	512,935,072 (**30%**)	Business services	487,617,248 (**33%**)	Public facilities management	653,512,896 (**49%**)
2	Pharmaceuticals	199,255,888 (**13%**)	Real estate	267,530,272 (**30%**)	Air transportation	337,996,000 (**33%**)	Business services	428,719,136 (**32%**)	Power, heat production & supply	457,927,552 (**3%**)	Power, heat production & supply	543,522,240 (**3%**)
3	Others	109,624,944 (**22%**)	Alcohol, beverage & tea manufacturing	217,532,592 (**47%**)	Alcohol, beverage & tea manufacturing	217,532,592 (**36%**)	Building decoration & other construction industry	241,956,000 (**30%**)	Real estate	409,824,800 (**29%**)	Real estate	485,830,720 (**20%**)
4	Real estate	98,953,248 (**21%**)	Automobile manufacturing	194,741,056 (**17%**)	Real estate	215,206,208 (**21%**)	Alcohol, beverage & tea manufacturing	219,627,264 (**23%**)	Automobile manufacturing	313,280,000 (**15%**)	Automobile manufacturing	422,771,136 (**14%**)
5	Computer, communication & other electronic equipment manufacturing	86,899,064 (**12%**)	Pharmaceuticals	191,031,152 (**11%**)	Automobile manufacturing	199,261,712 (**17%**)	Automobile manufacturing	217,111,776 (**12%**)	Building decoration & other construction industry	284,116,000 (**22%**)	Civil engineering construction	419,379,776 (**8%**)

Year	2013		2014		2015		2016		2017	
Rank	Industry	Impairments	Industry	Impairments	Industry	Impairments	Industry	Impairments	Industry	Impairments
1	Power, heat production & supply	1,519,811,968 (**9%**)	Public facilities management	922,326,272 (**53%**)	Power, heat production & supply	3,351,096,832 (**17%**)	Mining auxiliary activities	4,705,821,184 (**58%**)	Electrical machinery & equipment manufacturing	6,659,684,352 (**7%**)
2	Public facilities management	798,143,488 (**60%**)	Software & information technology services	745,295,232 (**4%**)	Computer, communication & other electronic equipment manufacturing	1,398,310,528 (**3%**)	Power, heat production & supply	3,451,939,584 (**16%**)	Computer, communication & other electronic equipment manufacturing	5,418,539,520 (**5%**)
3	Computer, communication & other electronic equipment manufacturing	527,474,528 (**5%**)	Non-metallic mineral products industry	524,880,992 (**9%**)	Software & information technology services	1,389,537,280 (**3%**)	Computer, communication & other electronic equipment manufacturing	3,376,087,296 (**3%**)	Mining auxiliary activities	4,612,263,936 (**54%**)
4	Real estate	478,975,072 (**17%**)	General equipment manufacturing	505,029,152 (**12%**)	Pharmaceuticals	1,100,580,224 (**3%**)	Real estate	1,686,721,664 (**11%**)	Software & information technology services	4,174,721,024 (**5%**)
5	Civil engineering construction	459,458,592 (**8%**)	Real estate	468,993,952 (**10%**)	Mining auxiliary activities	1,008,980,736 (**16%**)	Software & information technology services	1,590,496,640 (**3%**)	Power, heat production & supply	3,965,471,744 (**16%**)

Notes: This table reports the first five industries with the largest amount of goodwill impairments in descending order. The percentage in brackets is the ratio of goodwill impairments to total goodwill in a given year. Industries with a large amount of impairments remain relatively constant each year and their goodwill impairments account for a significant proportion of total goodwill.

Table A4
The amount of goodwill.

Year	2007		2008		2009		2010		2011		2012	
Rank	Industry	Goodwill	Industry	Goodwill	Industry	Goodwill	Industry	Goodwill	Industry	Goodwill	Industry	Goodwill
1	Petroleum & gas extraction	15,690,000,384 (**0%**)	Petroleum & gas extraction	17,808,541,696 (**0%**)	Petroleum & gas extraction	20,154,472,448 (**7%**)	Power, heat production & supply	14,207,736,832 (**1.2%**)	Power, heat production & supply	16,177,765,376 (**3%**)	Power, heat production & supply	17,319,483,392 (**3%**)
2	Non-ferrous metal smelting	2,404,116,480 (**0%**)	Power, heat production & supply	11,690,562,560 (**1.5%**)	Power, heat production & supply	12,082,382,848 (**1.6%**)	Petroleum & gas extraction	12,760,017,920 (**0%**)	Petroleum & gas extraction	12,457,206,784 (**0%**)	Petroleum & gas extraction	10,971,077,632 (**0%**)
3	Pharmaceuticals	1,490,920,576 (**13%**)	Non-ferrous metal smelting	2,589,202,176 (**0.03%**)	Non-ferrous metal smelting	2,685,785,600 (**0.2%**)	Air transportation	10,416,660,480 (**1.2%**)	Pharmaceuticals	8,584,333,824 (**2%**)	Pharmaceuticals	7,354,402,304 (**2%**)
4	Automobile manufacturing	1,153,491,712 (**0.1%**)	Electrical machinery & equipment manufacturing	2,414,225,664 (**0.4%**)	Retail	2,545,250,304 (**4%**)	Pharmaceuticals	2,899,251,712 (**7%**)	Electrical machinery & equipment manufacturing	4,205,152,000 (**6%**)	Computer, communication & other electronic equipment manufacturing	6,718,632,960 (**4%**)
5	Civil engineering construction	935,900,864 (**0.5%**)	Special equipment manufacturing	2,305,367,296 (**0.6%**)	Electrical machinery & equipment manufacturing	2,461,065,472 (**0.8%**)	Non-ferrous metal smelting	2,740,823,040 (**0%**)	Software & information technology services	4,080,908,288 (**2%**)	Civil engineering construction	5,088,548,864 (**8%**)

Year	2013		2014		2015		2016		2017	
Rank	Industry	Goodwill	Industry	Goodwill	Industry	Goodwill	Industry	Goodwill	Industry	Goodwill
1	Power, heat production & supply	16,952,892,416 (**9%**)	Pharmaceuticals	23,989,344,256 (**2%**)	Computer, communication & other electronic equipment manufacturing	49,399,160,832 (**3%**)	Computer, communication & other electronic equipment manufacturing	97,926,078,464 (**3%**)	Computer, communication & other electronic equipment manufacturing	113,964,122,112 (**5%**)
2	Pharmaceuticals	11,487,026,176 (**3%**)	Computer, communication & other electronic equipment manufacturing	18,820,114,432 (**2%**)	Software & information technology services	44,409,069,568 (**3%**)	Electrical machinery & equipment manufacturing	68,429,651,968 (**2%**)	Electrical machinery & equipment manufacturing	101,777,080,320 (**7%**)
3	Petroleum & gas extraction	10,375,837,696 (**0%**)	Software & information technology services	17,900,877,824 (**4%**)	Pharmaceuticals	41,796,796,416 (**3%**)	Pharmaceuticals	67,693,322,240 (**1%**)	Software & information technology services	81,609,490,432 (**5%**)
4	Computer, communication & other electronic equipment manufacturing	10,014,821,376 (**5%**)	Power, heat production & supply	17,538,435,072 (**0.9%**)	Electrical machinery & equipment manufacturing	25,919,782,912 (**1%**)	Software & information technology services	62,724,104,192 (**3%**)	Pharmaceuticals	77,823,827,968 (**2%**)
5	Chemical raw materials & chemical products manufacturing	8,072,478,208 (**3%**)	Automobile manufacturing	15,061,773,312 (**3%**)	Chemical raw materials & chemical products manufacturing	24,363,988,992 (**2%**)	Petroleum & gas extraction	53,184,176,128 (**0%**)	Internet & related services	66,142,105,600 (**3%**)

Notes: This table shows the top five industries with the largest amount of goodwill in descending order. The percentage in brackets is the ratio of goodwill impairments to goodwill for the industry in a given year. Industries that recognize a large amount of goodwill remain relatively constant each year and their impairments account for a very small proportion of total goodwill.

References

AbuGhazaleh, N.M., Al-Hares, O.M., Haddad, A.E., 2012. The value relevance of goodwill impairments: UK evidence. Int. J. Econ. Fin. 4, 206–216.

AbuGhazaleh, N.M., Al-Hares, O.M., Roberts, C., 2011. Accounting discretion in goodwill impairments: UK evidence. J. Int. Financ. Manage. Acc. 22, 165–204.

Adams, R., Almeida, H., Ferreira, D., 2005. Powerful CEOs and their impact on corporate performance. Rev. Financ. Stud. 18, 1403–1432.

Ayres, D.R., Neal, T.L., Reid, L.C., Shipman, J.E., 2019. Auditing goodwill in the post-amortization era: Challenges for auditors. Contemp. Acc. Res. 36, 82–107.

Bartov, E., Gul, F., Tsui, J., 2001. Discretionary-accruals models and audit qualification. J. Acc. Econ. 30, 421–452.

Beatty, A., Weber, J., 2006. Accounting discretion in fair value estimates: An examination of SFAS 142 goodwill impairments. J. Acc. Res. 44, 257–288.

Bens, D.A., Heltzer, W., Segal, B., 2011. The information content of goodwill impairments and SFAS 142. J. Acc. Audit. Fin. 26, 527–555.

Bharath, S.T., Sunder, J., Sunder, S.V., 2008. Accounting quality and debt contracting. Acc. Rev. 83, 1–28.

Biddle, G., Hilary, G., 2006. Accounting quality and firm level capital investment. Acc. Rev. 81, 963–982.

Bills, K., 2012. The effect of significant changes in auditor clientele and auditor–client mismatches on audit quality. SSRN Working Paper, Colorado State University..

Blay, A.D., Geiger, M.A., 2013. Auditor fees and auditor independence: Evidence from going concern reporting decisions. Contemp. Acc. Res. 30, 579–606.

Bo, X., Wu, L., 2011. Earnings management, information risks and audit opinion. Audit. Res. 1, 90–97.

Bradshaw, M.T., Richardson, S.A., Sloan, R.G., 2001. Do analysts and auditors use information in accruals?. J. Acc. Res. 39, 45–73.

Butler, M., Leone, A., Willenborg, M., 2004. An empirical analysis of auditor reporting and its association with abnormal accruals. J. Acc. Econ. 37, 139–165.

Cao, Q., Bu, H., 2013. Earnings management, audit fee and audit opinions. Audit. Res. 6, 76–83.

Carcello, J.V., Neal, T.L., Reid, L.C., Shipman, J.E., 2020. Auditor independence and fair value accounting: An examination of nonaudit fees and goodwill impairments. Contemp. Acc. Res. 37, 189–217.

Cheng, S.J., 2008. Board size and the variability of corporate performance. J. Financ. Econ. 87, 157–176.

Churyk, N.T., 2005. Reporting goodwill: Are the new accounting standards consistent with market valuations?. J. Bus. Res. 58, 1353–1361.

Craswell, A., Stokes, D.J., Laughton, J., 2002. Auditor independence and fee dependence. J. Acc. Econ. 33, 253–275.

Dechow, P.M., Sloan, R.G., Sweeney, A.P., 1995. Detecting earnings management. Acc. Rev. 70, 193–225.

Deng, X., Xu, Y., 2017. Consumers' responses to corporate social responsibility initiatives: The mediating role of consumer-company identifications. J. Bus. Ethics 142, 515–526.

Dong, P., Cheng, L., Qiao, K., 2018. Whether the auditor–client relationship affect the audit fees and audit quality?. Manage. World 8, 143–153.

Duan, Y., Chen, B., 2017. Assets impairment loss, audit fees and audit opinion. Audit. Res. 2, 40–47.

Fan, J., Zhang, Y., Liu, Q., 2013. Internal control, auditor industry expertise, accrual and real earnings management. Acc. Res. 4, 81–88 +96.

Francis, J., Hanna, J.D., Vincent, L., 1996. Causes and effects of discretionary asset write-offs. J. Acc. Res. 34, 117–134.

Francis, J., LaFond, R., Olsson, P., Schipper, K., 2005. The market pricing of accruals quality. J. Acc. Econ. 39, 295–327.

Francis, J.R., 2011. A framework for understanding and researching audit quality. Audit.: J. Pract. Theory 30, 125–152.

Glaum, M., Landsman, W.R., Wyrwa, S., 2018. Goodwill impairment: The effects of public enforcement and monitoring by institutional investors. Acc. Rev. 93, 149–180.

Gu, F., Lev, B., 2011. Overpriced shares, ill-advised acquisitions, and goodwill impairment. Acc. Rev. 86, 1995–2022.

Hayn, C., Hughes, P., 2006. Leading indicators of goodwill impairment. J. Acc. Audit. Fin. 21, 223–265.

Holthausen, R., Watts, R., 2001. The relevance of value-relevance literature for financial accounting standard setting. J. Acc. Econ. 31, 3–75.

International Accounting Standards Board (IASB), 2004. Impairment of Assets, International Accounting Standard 36. IASB, London, U.K..

Johnson, W.B., Lys, T., 1990. The market for audit services: Evidence from voluntary auditor changes. J. Acc. Econ. 12, 281–308.

Jordan, C., Clark, S., 2004. Big bath earnings management: The case of goodwill impairment under SFAS No. 142. J. Appl. Bus. Res. 20, 63–70.

Kothari, S.P., Leone, A.J., Wasley, C.E., 2005. Performance matched discretionary accrual measures. J. Acc. Econ. 39, 163–197.

Krishnan, G.V., 2003. Does Big 6 auditor industry expertise constrain earnings management?. Acc. Horiz. 17, 1–17.

Lam, K.C.K., Mensah, Y.M., 2006. The civil justice system and going-concern audit reports: Comments on "Auditors' decision-making under going-concern uncertainties in low litigation-risk environments: Evidence from Hong Kong". J. Acc. Public Policy 25, 754–764.

Lennox, C., 2000. Do companies successfully engage in opinion-shopping? Evidence from the UK. J. Acc. Econ. 29, 321–337.

Lhaopadchan, S., 2010. Fair value accounting and intangible assets: Goodwill impairment and managerial choice. J. Financ. Regulat. Compliance 18, 120–130.

Li, K.K., Sloan, R.G., 2017. Has goodwill accounting gone bad?. Rev. Acc. Stud. 22, 964–2003.

Li, L., Yao, H., 2019. Can shared auditors inhibit M&A goodwill bubbles? The evidence from Chinese listed companies. J. Audit Econ. 5, 32–42.
Li, Z., Shroff, P.K., Venkataraman, R., Zhang, I.X., 2011. Causes and consequences of goodwill impairment losses. Rev. Acc. Stud. 16, 745–778.
Lin, W., Zhong, H., Li, Q., 2018. The gains and losses of senior management experience? Evidence from the bond market. J. Financ. Res. 6, 171–188.
Liu, J., 2009. Ownership, earnings management and audit opinions. Audit. Res. 2, 32–39.
Liu, X., Liu, Z., 2014. The influence of internal control on fair value and earnings management. Audit. Res. 2, 59–66.
Lobo, G.J., Paugam, L., Zhang, D., Casta, J.F., 2017. The effect of joint auditor pair composition on audit quality: Evidence from impairment tests. Contemp. Acc. Res. 34, 118–153.
Menon, K., Williams, D.D., 1994. The insurance hypothesis and market prices. Acc. Rev. 69, 327–342.
Ministry of Finance, 2007. Impairment of Assets, Corporate Accounting Standard 8. Ministry of Finance of the People's Republic of China, Beijing, China.
Quan, X., Wu, S., 2010. CEO power, information disclosure quality and corporate performance variability: Empirical evidence from the listed companies in SZSE. Nankai Bus. Rev. 13, 142–153.
Ramanna, K., 2008. The implications of unverifiable fair-value accounting: Evidence from the political economy of goodwill accounting. J. Acc. Econ. 45, 253–281.
Ramanna, K., Watts, R.L., 2012. Evidence on the use of unverifiable estimates in required goodwill impairment. Rev. Acc. Stud. 4, 749–780.
Reynolds, J.K., Deis, J.D.R., Francis, J.R., 2004. Professional service fees and auditor objectivity. Audit.: J. Pract. Theory 23, 29–52.
Sevin, S., Schroeder, R., 2005. Earnings management: Evidence from SFAS No. 142 reporting. Manage. Audit. J. 20, 47–54.
Shu, S., 2000. Auditor resignations: Clientele effects and legal liability. J. Acc. Econ. 29 (2), 173–206.
Song, Y., He, Y., 2008. Supervision pressure and competitive pressure of audit market: The trade-offs of CPAs—Take the provision for impairment of long-term assets as an example. Manage. World 5, 144–150.
Stenheim, T., Madsen, D.O., 2016. Goodwill impairment losses, economic impairment, earnings management and corporate governance. J. Account. Fin. 16, 11–30.
Stock, J., Yogo, M., 2005. Testing for weak instruments in linear IV regression. In: Andrews, D.W.K., Stock, J.H. (Eds.), Identification and Inference for Econometric Models: Essays in Honor of Thomas Rothenberg. Cambridge University Press, Cambridge, pp. 80–108.
Wang, W., Wang, J., Fu, C., 2020. Client–auditor mismatches and accounting conservatism. Audit. Res. 3, 105–114.
Watts, R., 2003. Conservatism in accounting part I: Explanation and implications. Acc. Horiz. 17, 207–221.
Watts, R., Zimmerman, J., 1983. Agency problems, auditing and the theory of the firm: Some evidence. J. Law Econ. 26 (3), 613–633.
Wei, Z., Zhu, C., 2019. Does excess goodwill become the burden of corporate operation—Explanation from the perspective of product market competitiveness. China Ind. Econ. 11, 174–192.
Xia, L., Yang, H., 2002. Auditors' response to earnings management of listed firms. Audit. Res. 4, 28–34.
Xu, H., 2004. Earnings management and quality of independent audit. Acc. Res. 1, 44–49+96.
Ye, J., He, K., Yang, Q., Ye, Y., 2016. Unverifiable estimates in goodwill impairment test and audit fees. Audit. Res. 1, 76–84.
Zeff, S.A., Barton, A., 2009. Double accounting for goodwill: A problem redefined. Acc. Rev. 84, 1695–1697.
Zeng, X., Lu, Z., 2016. The information risk of earnings management, performance volatility, and audit opinions: How to escape from listed companies with extremely suspect earnings management?. J. Fin. Econ. 42, 133–144.
Zhang, D., 2012. Did auditors treat information risk differently? Based on the evidence between "positively adjusted" and audit opinion. Audit. Res. 3, 106–112.
Zhang, R., Li, X., 2012. Pyramid structure, performance fluctuation and credit risk. Acc. Res. 3, 62–71+95.
Zhao, Y., Ni, G., 2020. Auditors' industry expertise, property rights and investment efficiency. Audit. Res. 1, 87–95.
Zheng, C., Li, X., 2018. Merger goodwill and audit service pricing. Audit. Res. 6, 113–120.