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11 May 2020

Online at <https://mpra.ub.uni-muenchen.de/100459/>
MPRA Paper No. 100459, posted 19 May 2020 20:36 UTC

Managerial ability, financial performance and goodwill impairment: A moderated mediation analysis^{*}

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This version: May 11, 2020

Abstract: This paper examines whether and how managerial ability affects the likelihood of goodwill impairment of Chinese publicly listed companies over the period 2007-2017. We document a negative relationship between goodwill impairment and managerial ability, and uncover the mediation effect of corporate financial performance. Moreover, we find that the mediation effect is moderated by firms' earnings smoothing motivation and state ownership. The results suggest that when a company has the motivation to smooth earnings or is owned by the government, higher managerial ability of the company does not necessarily reduce the likelihood of goodwill impairment. The findings have important implications for investors and regulators.

Keywords: Goodwill impairment; Managerial ability; Financial performance; Moderated mediation

JEL codes: G32, G34, M41

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1. Introduction

The goodwill generated from transaction premium in mergers and acquisitions (M&A) has become an important asset for Chinese companies. The total amount of goodwill carrying balances of all A-share listed companies increased from about 30 billion yuan in 2007 to 1299 billion yuan in 2018. The ratio of goodwill to assets increased sharply from 2013 to 2015 and was above 7% since 2016 (see Appendix A). This fast growth of goodwill may become a serious concern for corporate performance¹ and has drawn the attention of the regulatory authorities. On November 16, 2018, the China Securities Regulatory Commission issued a risk warning for the accounting supervision of goodwill impairment.²

Against this backdrop, we wonder whether and how managerial ability matters for goodwill impairment of Chinese companies. Several studies have examined the determinants of goodwill impairment (Beatty & Weber, 2006; Glaum, Landsman, & Wyrwa, 2018; Ramanna & Watts, 2012), but none of them concerning the effect of managerial ability. An exception is Sun (2016) who finds a negative relationship between managerial ability and goodwill impairment of companies listed in the US, but the mechanism remains unexplored. Moreover, we can hardly draw experience on goodwill impairment from the US due to the difference of accounting supervision and corporate culture between the US and China.

To shed light on the role of managerial ability in goodwill impairment of Chinese companies, we perform a moderated mediation analysis based on a sample of 389 companies listed in the Chinese stock market. These companies recognized goodwill impairment losses at least once during the period 2007-2017. First, we examine the mediation effect of corporate financial performance in the relationship between managerial ability and goodwill impairment. Our primary results show that managerial ability has a direct negative impact on the likelihood of goodwill impairment while financial performance is positively associated with managerial ability. Further results show that the likelihood of goodwill impairment is negatively associated with both managerial ability and financial performance. Overall, the results suggest that financial

¹ For instance, some researchers find that many companies ever recognized huge goodwill impairment at one time, followed by negative sales growth (Jarva, 2009) and/or low cash flows (Z. Li, Shroff, Venkataraman, & Zhang, 2011) in subsequent years. Filip et al. (2015) find that managers manipulate cash flows to avoid reporting an impairment loss where the manipulation is detrimental to corporate future performance.

² See http://www.csrc.gov.cn/pub/newsite/kjb/kjbzcgf/xsjzi/sjpgjggz/201811/t20181116_346845.html.

performance partially mediates the effect of managerial ability on goodwill impairment. These findings support our conjecture that superior managers can better help their companies to achieve higher returns and therefore reduce the likelihood of goodwill impairment.

Second, we examine whether the mediation effect of financial performance is affected by earnings smoothing motivation. Some studies find that firms with unexpected high earnings tended to recognize goodwill impairment to smooth earnings (AbuGhazaleh, Al-Hares, & Roberts, 2011; Glaum et al., 2018). Such discretion in goodwill impairment decisions may weaken the relationship between managerial ability and goodwill impairment. Based on a moderated mediation model, we find that the earnings smoothing motivation attenuates the negative relationship between financial performance and the possibility of goodwill impairment, but has no impact on the relationship between managerial ability and financial performance. This suggests that earnings smoothing motivation does weaken the relationship between managerial ability and goodwill impairment.

Third, we examine whether the mediation effect of financial performance is affected by state ownership as researchers argue that government intervention could be both a curse and a blessing for state-owned enterprises (SOEs) (Feng, Fu, & Kutan, 2019; Shleifer & Vishny, 1994). This means that the impact of state ownership on the relationship between managerial ability and goodwill impairment is not easy to judge. Based on a moderated mediation model, we find that state ownership weakens the impact of managerial ability on both financial performance and the possibility of goodwill impairment. This suggests that state ownership not only weakens the mediation effect of financial performance, but also lowers the direct effect of managerial ability in goodwill impairment.

Overall, we uncover a moderated mediation effect of financial performance in the relationship between managerial ability and goodwill impairment, and call for attention to the effects of earnings smoothing motivation and state ownership when analyzing a firm's goodwill impairment decision. The finding is robust to a series of additional tests, including the Sobel test for the mediation effect, analysis that excluding the Global Financial Crisis, and alternative proxies for managerial ability, financial performance and goodwill impairment.

Our paper contributes to the literature in two ways. First, we complement the research on determinants of goodwill impairment by shedding light on the impact of

managerial ability and its mechanisms. Several studies have examined the determinants of goodwill impairment (e.g., see Glaum et al., 2018; Hayn & Hughes, 2006; Ramanna & Watts, 2012), but none of them concerning the impact of managerial ability. An exception is Sun (2016) who examines the impact of managerial ability on goodwill impairment, but he does not explore the mechanisms. To the best of our knowledge, we are the first to uncover the mediation effect of financial performance. Second, we are the first to study the relationship between managerial ability and goodwill impairment in the context of Chinese companies and document the moderation effects of earnings smoothing and state ownership. Because China is the largest emerging market and the second largest economy in the world, our study may have important implications for other countries and might lead to a bunch of follow-up studies to verify the relationship between managerial ability and goodwill impairment in other countries.

The remainder of the paper is structured as follows. Section 2 discusses related research and develops our hypotheses. Section 3 describes the methodology and sample. We present our results and analyses in Section 4. Section 5 concludes.

2. Motivation and hypotheses

Goodwill impairment has drawn great attention from researchers with the fast growth of M&A activities in recent years,³ while we are particularly interested in the determinants of goodwill impairment. A few studies have tried to examine the determinants of goodwill impairment. To name a few, Hayn and Hughes (2006) find that acquisition characteristics (such as takeover premium) have positive predictive power for future goodwill impairment. (Ramanna and Watts (2012) provide evidence of the association of goodwill non-impairment decisions with executive compensation and reputation. Glaum et al. (2018) find that goodwill impairment is negatively associated with stock returns. However, the impact of managerial ability on goodwill impairment has not been well studied. Therefore, below we illustrate the motivation for our hypotheses.

³ For instance, researchers have compared the impact of the impairment-only approach and the amortization approach on companies' income statements (Chalmers, Godfrey, & Webster, 2011; Hamberg, Paananen, & Novak, 2011), investigated the stock market reaction to goodwill impairment (Bens, Heltzer, & Segal, 2011; Li & Sloan, 2017), and analyzed the determinants of goodwill impairment (Beatty & Weber, 2006; Glaum et al., 2018; Hayn & Hughes, 2006; Ramanna & Watts, 2012).

2.1 Managerial ability, financial performance and goodwill impairment

The upper echelons theory of Hambrick and Mason (1984) suggests that the experience, values and personality of senior executives could affect their perception on their companies' situation and then affect their strategic decisions. Motivated by this theory, we conjecture that managerial quality may also be an important factor behind the decision of goodwill impairment. Empirically, Brochet and Welch (2012) find that chief financial officers with transaction experience can write off goodwill in a more informative way. Sun (2016) finds that managerial ability is negatively related to the likelihood of goodwill impairment of US companies. Based on these studies, we revisit the relationship between managerial ability and goodwill impairment in the context of Chinese companies with the following hypothesis:

H1: The likelihood of goodwill impairment of Chinese companies is negatively associated with managerial ability.

If the negative association does hold for Chinese companies, a further question of importance is through which channel that managerial ability affects goodwill impairment. Given that goodwill impairment arises when there is deterioration in the capabilities of acquired assets to generate excess returns as expected. A natural logic is that superior managers can better operate the acquired assets to achieve expected excess returns, thereby reducing the likelihood of goodwill impairment. Indeed, some studies find that firms with superior managers have higher returns (e.g., P. R. Demerjian, Lev, Lewis, & McVay, 2013; Lee, Wang, Chiu, & Tien, 2018). Therefore, we propose the following testable hypothesis:

H2: Financial performance is a mediator in the relationship between managerial ability and goodwill impairment of Chinese companies.

2.2 The moderation effect of earnings smoothing motivation

As earnings provide important information for investment decisions, executives may have strong incentives to manage earnings either for shareholders or for self-interest. Degeorge, Patel and Zeckhauser (1999) provide theoretical and empirical evidence that earnings management with different incentives could happen when earnings exceed different thresholds. For instance, Iatridis (2015) find that executives of firms with significant growth options may opportunistically direct slack resources as corporate giving to increase their personal reputation at the expense of shareholders' returns. This implies that earnings management can be simply due to executives' self-interest

behavior. In contrast, Kirschenheiter and Melumad (2002) find that managers tend to report smaller earnings surprise to convey more precise private information about future cash flow in order to maximize firms' value. Jiraporn, Miller, Yoon and Kim (2008) uncover a positive relationship between earnings management and firm value. These studies suggest that earnings management can also be beneficial to shareholders.

Nevertheless, in the presence of earnings management, companies' reported returns fail to reflect the underlying performance during the reporting periods, so does their reported goodwill impairment losses. For instance, AbuGhazaleh et al. (2011) and Glaum et al. (2018) find that firms with unexpected high pre-write-off earnings are more likely to write off goodwill. Similarly, Demerjian, Lewis-Western and McVay (2020) find that high-ability managers are more likely to engage in earnings smoothing. In this case, goodwill impairment losses cannot truly reflect the decline in economic values of firms' goodwill balances implied by realized returns. The presence of earnings smoothing may distort the intrinsic relationships between managerial ability, financial performance and goodwill impairment. Therefore, we propose the following testable hypothesis:

H3: Earnings smoothing motivation significantly moderates the relationship between managerial ability and goodwill impairment.

2.3 The moderation effect of state ownership

The Chinese government largely involves in resources allocation of the market and favors state-owned enterprises (SOEs). As governmental involvement may be "helping hands" or "grabbing hands" (Shleifer & Vishny, 1994), we wonder whether the relationship between managerial ability and goodwill impairment differs in SOEs and non-SOEs.

The argument of "helping hands" suggests that SOEs have priority in obtaining bank credit (Cull & Xu, 2003) and receiving subsidies (Li, Lien, & Zheng, 2019) compared with non-SOEs. As SOEs enjoy government implicit guarantees, they are less likely to be required to provide collaterals when they are in financial distress (An, Pan, & Tian, 2014). In contrast, the argument of "grabbing hands" suggests that Chinese SOEs are imposed on policy burdens, such as hiring redundant workers. Such burdens may hamper corporate development, resulting in poor corporate performance (Lin, Cai, & Li, 1998). Moreover, the actual controllers of SOEs, who are central or local government officials, are also agents in charge of state-owned assets. Hopkin and

Rodríguez-Pose (2007) argue that government agents may abuse their power to expropriate corporate resources and seek rents, leading to more severe moral hazard and adverse selection in SOEs. For example, Feng et al. (2019) find that government intervention promotes firms' financial access to capital by making informal payments.

Nevertheless, the above analysis suggests that the relationship between managerial ability and goodwill impairment may differ in SOEs and non-SOEs due to potential government intervention in SOEs. To examine whether state ownership does affect the relationship between managerial ability and goodwill impairment, we propose the following hypothesis:

H4: State ownership significantly moderates the relationship between managerial ability and goodwill impairment.

3. Methodology and sample

This section introduces our methodology to explore how managerial ability matter for goodwill impairment. As managerial ability is our key explanatory variable which is not directly observable, we first illustrate how to measure managerial ability in Section 3.1. We then present our mediation model in Section 3.2 and the moderated mediation model in Section 3.3. In Section 3.4, we describe our sample and data.

3.1 Measuring managerial ability

Properly quantifying managerial ability is challenging but central to many research questions. Recently, Demerjian, Lev and McVay (2012) develop a novel measure of managerial ability based on managers' relative efficiency in generating revenues. Demerjian et al. (2012) show that their measure is strongly associated with manager fixed effects and with some indicators of corporate performance, and demonstrate that their measure outperforms the existing measures. Therefore, we apply their measure to capture managerial ability for Chinese firms. Following Demerjian et al. (2012), we first employ the Data Envelopment Analysis (DEA) approach to generate a measure of total firm efficiency (Θ) from Eq. (1):

$$\max \theta = \frac{Sales}{v_1 COGS + v_2 SG \& A + v_3 R \& D + v_4 PPE + v_5 GW + v_6 Intan} \quad (1)$$

where *COGS* (cost of goods sold), *SG&A* (selling, general and administrative expenses), *R&D* (research and development cost), *PPE* (property, plant and equipment), *GW*

(goodwill), and *Intan* (other intangibles) are input variables of total firm efficiency while *Sales* is the corresponding output variable. Besides, the flow variables *Sales*, *COGS*, *SG&A* and *R&D* are measured over year t , while the stock variables *PPE*, *GW*, and *Intan* are measured at the beginning of year t . Demerjian et al. (2012) also take the net operating leases as an input to increase the input comparability among firms that either lease or buy their revenue-generating equipment. Notice that Chinese listed companies usually buy rather than lease fixed assets, we do not include the operating leases in our model. As DEA evaluates all points with respect to their deviation from the frontier, the values of θ are between 0 and 1.

We solve Eq. (1) to obtain θ and then regress θ on six firm characteristics that affect firm efficiency: firm size (*Size*), market share (*Mshare*), cash availability (*CashFlow*), life cycle (*AGE*), operational complexity (*Concentration*), and foreign operations (*Foreign*):

$$\begin{aligned} \theta = & \beta_0 + \beta_1 Size + \beta_2 Mshare + \beta_3 CashFlow + \beta_4 Age + \beta_5 Concentration \\ & + \beta_6 Foreign + \sum Year + \varepsilon \end{aligned} \quad (2)$$

where the residual ε is used as a proxy for managerial ability, as suggested by Demerjian et al. (2012). In Eq. (2), *Size* is the natural logarithm of a firm's assets at the end of year t . *Mshare* is the share of firm sales to industry total sales. *CashFlow* is an indicator variable for available cash, which equals one when a firm has nonnegative free cash flow and otherwise zero. *Age* is the number of years for which the firm has been listed. *Concentration* indicates the diversification of a firm's operations, measured by the Herfindahl-Hirschman Index of business segment sales within the firm. *Foreign* is an indicator variable which equals one if the firm reports nonzero value of foreign currency adjustment and otherwise zero.

3.2 The mediation model

Based on the framework of testing mediation effect suggested by Baron and Kenny (1986), we construct the following model (Eqs. (3) to (5)) to examine whether financial performance is the mediator between managerial ability and the likelihood of goodwill impairment:

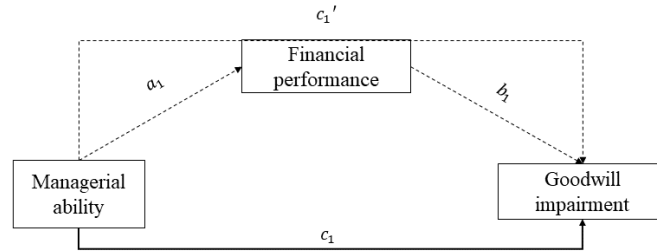
$$IMP_{it} = c_0 + c_1 MA_{it} + c' CONTROLS_{it} + YearFE + IndustryFE + \varepsilon_{it} \quad (3)$$

$$AB_ROA_{it} = a_0 + a_1 MA_{it} + a' CONTROLS_{it} + YearFE + IndustryFE + \varepsilon_{it} \quad (4)$$

$$IMP_{it} = c_0 + c_1 MA_{it} + b_1 AB_ROA_{it} + b' CONTROLS_{it} + YearFE + IndustryFE + \varepsilon_{it} \quad (5)$$

where IMP is an indicator which equals 1 if the firm records a goodwill impairment in year t and 0 otherwise. MA indicates managerial ability scores obtained from Eq. (2). AB_ROA is the proxy for financial performance, calculated as the difference between firm i 's ROA and the industry average ROA over year t . We calculate ROA as the EBIT before goodwill impairment divided by annual average total assets to avoid potential simultaneity bias.

$CONTROLS$ refers to firm-level control variables that are likely to affect goodwill impairment incidence (see Beatty & Weber, 2006; Glaum et al., 2018; Ramanna & Watts, 2012): $RETURN$ is a firm's annual stock return; $BIG4$ is an indicator that equals 1 for firms that are audited by a Big 4 auditing firm; $INSTI_OWN$ is the percentage of equity shares held by institutional investors; $SEGMENT$ is the number of operating segments; $SIZE$ is the log of annual average assets; GW/TA is the ratio of goodwill before impairment to annual average assets; and MBV is a firm's market-to-book ratio of annual average assets. We also include industry and year dummies to control for unobservable factors.



Note: This figure summarizes our mediation model. The solid line (c_1) indicates the direct effect of MA on IMP in Eq. (3), while the dotted lines (a_1 , b_1 and c_1') illustrate the mediation paths from MA to IMP that is driven by AB_ROA .

Fig. 1: The conceptual mediation model

We estimate Eq. (3) and Eq. (5) by Logistic regression to examine the effect of managerial ability on the likelihood of goodwill impairment while Eq. (4) is estimated by OLS regression to examine the effect of managerial ability on financial performance. Fig. 1 summarizes the conceptual mediation model (Eqs. (3)-(5)). The steps to evaluate the mediation model are described as follows: First, managerial ability has a significant direct impact on the likelihood of goodwill impairment if MA coefficient c_1 in Eq. (3) is significant. Second, financial performance mediates the relationship between

managerial ability and goodwill impairment if *MA* coefficient a_1 in Eq. (4) and *AB_ROA* coefficient b_1 in Eq. (5) are statistically significant. Third, there is a partial mediation effect if *MA* coefficient c_1' in Eq. (5) becomes smaller and less significant compared with that in Eq. (3), or a full mediation effect if c_1' is insignificantly different from zero.

3.3 The moderated mediation model

To examine whether and how earnings smoothing and state ownership moderate the mediation effect of financial performance, below we construct the moderated mediation model following Muller, Judd and Yzerbyt (2005):

$$IMP_{it} = c_0 + c_1MA_{it} + c_2SMOOTH_{it} + c_3MA_{it} \times SMOOTH_{it} + c'CONTROLS_{it} + YearFE + IndustryFE + \varepsilon_{it} \quad (6)$$

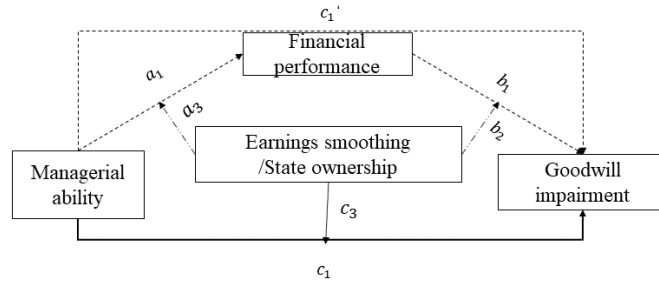
$$AB_ROA_{it} = a_0 + a_1MA_{it} + a_2SMOOTH_{it} + a_3MA_{it} \times SMOOTH_{it} + a'CONTROLS_{it} + YearFE + IndustryFE + \varepsilon_{it} \quad (7)$$

$$IMP_{it} = c_0' + c_1'MA_{it} + c_2'SMOOTH_{it} + b_1AB_ROA_{it} + b_2AB_ROA_{it} \times SMOOTH_{it} + b'CONTROLS_{it} + YearFE + IndustryFE + \varepsilon_{it} \quad (8)$$

$$IMP_{it} = c_0' + c_1'MA_{it} + c_2'SMOOTH_{it} + c_3'MA_{it} \times SMOOTH_{it} + b_1AB_ROA_{it} + b_2AB_ROA_{it} \times SMOOTH_{it} + b'CONTROLS_{it} + YearFE + IndustryFE + \varepsilon_{it} \quad (9)$$

where *SMOOTH* is an indicator for earnings smoothing motivation, taking 1 if the firm i 's income is positive in year t and its yearly change is above the median of firms with positive changes in income in the same year, and 0 otherwise (c.f., AbuGhazaleh et al., 2011; Glaum et al., 2018). We replace *SMOOTH* in the Eqs (6) to (9) by *SOE* to examine the moderation effect of state ownership with the same procedure, where *SOE* is an indicator which equals 1 if a firm is a SOE and 0 otherwise.

In the above moderated mediation model, Eq. (6) aims to examine whether earnings smoothing motivation (or state ownership) moderates the direct effect of managerial ability on the likelihood of goodwill impairment; Eq. (7) examines whether earnings smoothing motivation (or state ownership) moderates managerial ability's effect on financial performance; Eqs. (8) and (9) intend to examine whether earnings smoothing motivation (or state ownership) moderates the effect of financial performance on goodwill impairment. The conceptual moderated mediation model is summarized in Fig. 2.



Note: This figure depicts the possible moderating paths of earnings smoothing motivation or state ownership on the direct (solid lines) or indirect (dotted lines) effect of managerial ability on goodwill impairment.

Fig. 2: The conceptual moderated mediation model

Take the earnings smoothing motivation as an example, the steps to investigate its moderation effect are as follows: First, a significant coefficient c_3 of the interaction $MA \times SMOOTH$ in Eq. (6) indicates that the earnings smoothing motivation moderates the direct effect of managerial ability on goodwill impairment. Second, if the direct effect is moderated, we then estimate Eq. (7) and Eq. (9), and otherwise Eq. (7) and Eq. (8). Third, if the coefficient a_3 of the interaction $MA \times SMOOTH$ in Eq. (7) and the coefficient b_1 of AB_ROA in Eq. (8) or Eq. (9) are significant, we argue that earnings smoothing motivation moderates the mediation path from managerial ability to financial performance. Likewise, if MA coefficient a_1 in Eq. (7) and the coefficient b_2 of the interaction $AB_ROA \times SMOOTH$ in Eq. (8) or Eq. (9) are significant, we argue that earnings smoothing motivation moderates the mediation path from financial performance to goodwill impairment.

3.4 Sample, data and descriptive statistics

To examine the effect of managerial ability on goodwill impairment, we consider the 977 firms included in the Shanghai 50 Index and the Shenzhen Component Index over the period 2007-2017. These firms account for more than 70% of the Chinese stock market in terms of market value and therefore are a good representation of the whole stock market. Our sample starts from 2007 because the new Chinese Accounting Standards (CAS) were implemented since 2007. We exclude 55 financial firms because their operation patterns and financial structures are quite different from non-financial firms. We also require that firms should have positive goodwill balances and ever recognize goodwill impairment. As a result, our sample comprises 389 firms with 2689 firm-year observations. We obtain all data on these firms from the Wind database.

To investigate whether firm-level characteristics when firm-year observations with goodwill impairment are significantly different from that when firm-year observations without goodwill impairment, we divide our firm-year observations into two groups: one with ($IMP=1$) and one without ($IMP=0$) goodwill impairment records. Table 1 presents descriptive statistics of these two groups, as well as the results of t test (two-tailed) for differences in means. We find that the mean of managerial ability (MA) for the group without an observation of goodwill impairment is -0.02, being significantly higher than that of the group with goodwill impairment observations. This implies that managerial ability probably has a significant impact on the possibility of goodwill impairment.

Table 1. Descriptive statistics

Note: This table presents mean, median, and standard deviation of each variable for the group that recognize goodwill impairment ($IMP=0$) and the group without an observation of goodwill impairment ($IMP=1$). MA is the managerial ability score obtained from Eq. (2). AB_ROA is the difference between firm specific ROA and industry average ROA. $RETURN$ is the firm's annual stock return, $BIG\ 4$ is an indicator variable that equals 1 for firms that are audited by one of the Big 4 auditing firms; $INSTI_OWN$ is the percentage of equity shares held by institutional investors; $SEGMENT$ is the number of operating segments; $SIZE$ is the log of annual average assets; GW/TA is the ratio of goodwill before impairment to average assets; MBV is the firm's market-to-book ratio of annual average assets. All variables are winsorized at the 1st and 99th percentiles to eliminate the effects of outliers.

Group	$IMP=0$ (Obs.=2030)			$IMP=1$ (Obs.=668)			Difference in Mean
	Mean	Median	Std.Dev	Mean	Median	Std.Dev	
MA	-0.02	-0.02	0.11	-0.04	-0.03	0.12	0.02***
AB_ROA	0.01	0.01	0.07	0.00	0.00	0.06	0.02***
$SMOOTH$	0.38	0	0.48	0.34	0	0.48	0.03
SOE	0.35	0	0.48	0.31	0	0.46	0.04**
$RETURN$	0.02	0.02	0.05	0.01	0.00	0.05	0.01***
$INSTI_OWN$	0.42	0.41	0.24	0.36	0.33	0.22	0.06***
$BIG4$	0.09	0	0.29	0.06	0	0.23	0.04***
$SEGMENT$	3.35	3	1.80	3.27	3	1.84	0.08
$SIZE$	22.49	22.23	1.50	22.65	22.44	1.31	-0.16**
MBV	2.43	1.95	1.51	2.32	1.91	1.40	0.11*
GW/TA	0.05	0.01	0.10	0.08	0.02	0.12	-0.03***

In addition, the group without an observation of goodwill impairment has higher abnormal ROA (AB_ROA) and stock return ($RETURN$) than the other group. These results suggest that, on average, the Chinese companies have better accounting and

market performance when they do not need to write off goodwill impairment, which is in line with our expectation. For other control variables, the tests of difference in means seem to suggest that Chinese companies tend to have higher institutional shares and market-to-book ratios, lower ratios of goodwill to assets, and to choose the Big 4 auditing firms when they do not have to recognize goodwill impairment (see Table 1).

4. Results

This section presents our results and analyses for the hypotheses developed in Section 2. First, we analyze the mediation effect of financial performance in the relationship between managerial ability and goodwill impairment in Section 4.1. Sections 4.2 and 4.3 examine whether the mediation effect of financial performance depends on earnings smoothing motivation and state ownership, respectively. In Section 4.4, we perform additional tests to assess the robustness of our findings.

4.1 Analysis of the mediation effect of financial performance

This subsection examines whether the effect of managerial ability on the likelihood of goodwill impairment is mediated by financial performance using the mediation model illustrated in Section 3.2. First, we perform Hausman tests for Eqs. (3) to (5) where the results appear to support the use of random effects models⁴. Second, we calculate the variance inflation factors of our independent variables where the values range from 1.08 to 2.00, suggesting that multicollinearity is not a concern in our regressions. Table 2 presents the estimation results of Eqs. (3) to (5).

In Eq. (3), *MA*'s coefficient is -0.143 with *p*-value smaller than 0.01, suggesting that managerial ability has a negative direct impact on the likelihood of goodwill impairment. Moreover, the marginal effect suggests that the likelihood of writing off goodwill decreases by 2.16% when managerial ability increases by one standard deviation (see Table 2). These results support our first hypothesis developed in Section 2.1 and are in line with the finding of Sun (2016).

In Eq. (4), the coefficient of *MA* is 0.281 with *p*-value smaller than 0.01, suggesting that higher managerial ability significantly results in higher corporate returns. This finding is consistent with the intuition that superior managers are more

⁴ To be careful, we also present the results of two-way fixed-effects models in Appendix B, which delivers the same conclusion as that presented in this section.

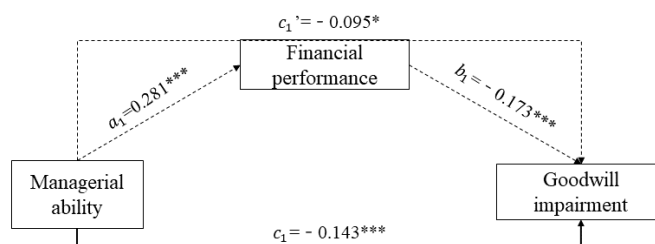
likely to earn higher returns for their companies. In Eq. (5), the coefficient of *MA* is smaller and less significant compared with that in Eq. (3), and the absolute value of the marginal effect of *MA* decreases from 2.16% in Eq. (3) to 1.46% in Eq. (5). Moreover, the coefficient of *AB_ROA* is -0.173, being significant at the 1% level (see Table 2). These results suggest that the reduction in the marginal effect of *MA* is due to the inclusion of the mediator *AB_ROA* to the model.

Table 2. The mediation effect of financial performance

Note: Estimation results of Eqs. (3)-(5). We illustrate the economic significance by marginal effects of independent variables in logistic regression of Eq. (3) and Eq. (5), which mean how the probability of impairing goodwill changes with one standard deviation increase in corresponding variable. Continuous variables are winsorized at the 1st and 99th percentiles to eliminate the effects of outliers and normalized to eliminate the effect of different dimension. Variables definitions please see the note of Table 1. Standard errors of estimate are in parentheses. ***, ** and * mean statistical significance at the 1%, 5%, and 10% levels, respectively.

Model	Eq. (3)		Eq. (4)		Eq. (5)	
Dependent Variable	<i>IMP</i>		<i>AB_ROA</i>		<i>IMP</i>	
	Coef	Margins	Coef	Coef	Margins	
<i>MA</i>	-0.143*** (0.052)	-2.16%	0.281*** (0.017)	-0.095* (0.054)	-1.46%	
<i>AB_ROA</i>				-0.173*** (0.060)	-2.83%	
<i>RETURN</i>	-0.022 (0.081)	-0.35%	0.035 (0.024)	-0.010 (0.081)	-0.16%	
<i>INSTI_OWN</i>	-0.221*** (0.062)	-3.42%	0.100*** (0.023)	-0.203*** (0.062)	-3.15%	
<i>BIG4</i>	-0.510** (0.246)	-2.24%	-0.272** (0.116)	-0.545** (0.247)	-2.39%	
<i>SEGMENTS</i>	0.092* (0.056)	1.52%	-0.050** (0.024)	0.086 (0.056)	1.42%	
<i>SIZE</i>	0.099 (0.088)	1.63%	0.046 (0.039)	0.107 (0.088)	1.76%	
<i>MBV</i>	-0.032 (0.073)	-0.51%	0.259*** (0.025)	0.012 (0.074)	0.20%	
<i>GW_TA</i>	0.106* (0.054)	1.76%	-0.027 (0.021)	0.110** (0.054)	1.83%	
Year fixed effect	Included		Included		Included	
Industry fixed effect	Included		Included		Included	
N	2698		2698		2698	

The mediating process of financial performance is displayed in Fig. 3 in an intuitive way. To formally determine the statistical significance of the mediation effect, we calculate the Sobel (1982) test and find that the z-statistic is -3.37, which is significant at the 1% level. These results suggest that corporate financial performance partially mediates the impact of managerial ability on the likelihood of goodwill impairment. The finding supports our second hypothesis developed in Section 2.1.



Note: This figure depicts how financial performance partially mediates in the relationship between managerial ability (*MA*) and goodwill impairment incidence (*IMP*). The solid line and dotted lines indicate the direct effect and indirect effect of *MA* on *IMP*, respectively.

Fig. 3. The mediation path of financial performance

At last, similar to the finding of Glaum et al. (2018), we find that the likelihood of goodwill impairment is negatively and significantly associated with *INSTI_OWN* and *BIG4*, and positively and significantly associated with *GW_TA*. These results suggest that the companies with higher percentage of equity shares held by institutional investors and audited by Big 4 auditing firms are less likely to recognize goodwill impairment, while the companies with higher ratios of goodwill before impairment relative to assets are more likely to write off goodwill.

4.2 Analysis of the moderation effect of earnings smoothing motivation

To examine whether earnings smoothing motivation affects the indirect effect of managerial ability on goodwill impairment, we estimate Eqs. (6) to (9) presented in Section 3.3. The results are summarized in Table 3.

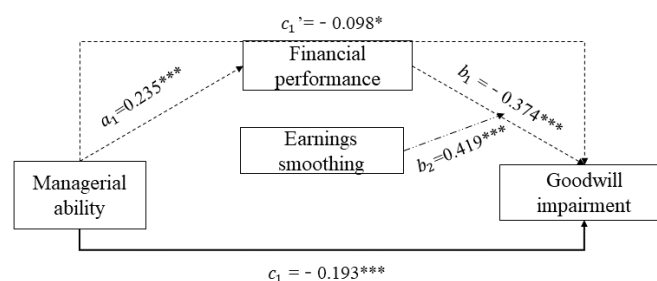
We find that the coefficient of the interaction $MA \times SMOOTH$ is insignificant in both Eqs. (6) and (7). This suggests that earnings smoothing motivation does not affect the direct effect of managerial ability on goodwill impairment incidence and the impact of managerial ability on financial performance. However, the coefficients of *AB_ROA* and the interaction $AB_ROA \times SMOOTH$ in Eq. (8) are statistically significant at the 1% level. These results support our third hypothesis that earnings smoothing motivation

significantly moderates the mediation effect of financial performance, where the moderation takes effect in the relationship between financial performance and goodwill impairment. Fig. 4 displays the moderation effect of earnings smoothing motivation on the mediation paths in an intuitive way.

Table 3. The moderation effect of earnings smoothing motivation

Note: Estimation results of Eqs. (6)-(8). As the direct effect is not moderated by earnings smoothing motivation, we regress Eq (8) after regressing (6) and (7). Continuous variables are winsorized at 1st and 99th percentiles to eliminate the effects of outliers and normalized to eliminate the effect of different dimension. Variables definitions refer to the note of Table 1. Standard errors of estimate are in parentheses. ***, ** and * mean statistical significance at the 1%, 5%, and 10% levels, respectively.

Model	Eq. (6)	Eq. (7)	Eq. (8)
Dependent Variable	<i>IMP</i>	<i>AB_ROA</i>	<i>IMP</i>
<i>MA</i>	-0.193*** (0.066)	0.235*** (0.020)	-0.098* (0.054)
<i>SMOOTH</i>	0.028 (0.112)	0.627*** (0.032)	0.141 (0.124)
<i>MA</i> × <i>SMOOTH</i>	0.127 (0.105)	0.001 (0.029)	
<i>AB_ROA</i>			-0.374*** (0.082)
<i>AB_ROA</i> × <i>SMOOTH</i>			0.419*** (0.123)
Control variables	Included	Included	Included
Year fixed effect	Included	Included	Included
Industry fixed effect	Included	Included	Included
N	2698	2698	2698



Note: This figure depicts how earnings smoothing moderates the mechanism between managerial ability (*MA*) and goodwill impairment incidence (*IMP*). The solid line and dotted lines indicate the direct effect and indirect effect of *MA* on *IMP*, respectively.

Fig. 4. The mediation effect moderated by earnings smoothing motivation

Specifically, the average effect of financial performance (AB_ROA) on goodwill impairment incidence (IMP) is -0.374 for companies without earnings smoothing motivation ($SMOOTH = 0$), while 0.045 (i.e., $0.419 - 0.374$) for companies with earnings smoothing motivation ($SMOOTH = 1$) (see Table 3). These results suggest that a company is more likely to write off goodwill for the sake of smoothing earnings when the company achieves higher returns. Therefore, the presence of earnings smoothing motivation weakens the indirect effect of managerial ability on goodwill impairment. Our findings are supported by Glaum et al. (2018) who find that firms with unusually high income tend to utilize goodwill impairment as a way to smooth earnings.

4.3 Analysis of the moderation effect of state ownership

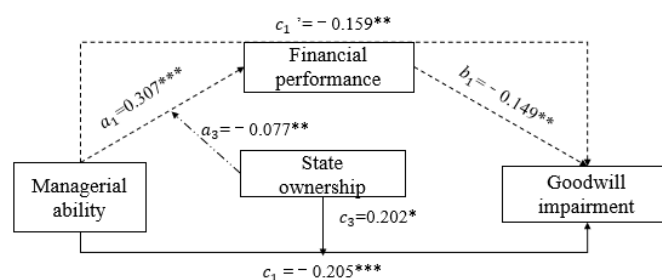
To examine whether state ownership affects the indirect effect of managerial ability on goodwill impairment, we replace $SMOOTH$ in Eqs. (6) to (9) by SOE and re-estimate the equations as done in Section 4.2. We present the results in Table 4.

Table 4. The moderation effect of state ownership

Note: Estimation results of Eq (6), (7) and (9) after replacing $SMOOTH$ by SOE . As the direct link between managerial ability and goodwill impairment is moderated by property rights, we regress Eq (9) after regressing (6) and (7). Continuous variables are winsorized at 1st and 99th percentiles to eliminate the effects of outliers and normalized to eliminate the effect of different dimension. Variables definitions refer to the note of Table 1. Standard errors of estimate are in parentheses. ***, ** and * mean statistical significance at the 1%, 5%, and 10% levels, respectively.

Model	Eq. (6)	Eq. (7)	Eq. (9)
Dependent Variable	IMP	AB_ROA	IMP
MA	-0.205*** (0.063)	0.307*** (0.021)	-0.159** (0.067)
SOE	0.163 (0.139)	-0.111 (0.070)	0.137 (0.140)
$MA \times SOE$	0.202* (0.109)	-0.077** (0.036)	0.192* (0.115)
AB_ROA			-0.149** (0.073)
$AB_ROA \times SOE$			-0.042 (0.124)
Control variables	Included	Included	Included
Year fixed effect	Included	Included	Included
Industry fixed effect	Included	Included	Included
N	2615	2615	2615

We find that the coefficient of *SOE* is insignificant in all equations, but the coefficient of the interaction $MA \times SOE$ is statistically significant in Eqs. (6) and (7). The results suggest that state ownership has a significant impact on the direct effect of managerial ability on goodwill impairment incidence and on the relationship between managerial ability and financial performance. Therefore, we estimate Eq. (9) instead of Eq. (8) to evaluate whether state ownership moderates the mediation effect of financial performance. We find that the coefficient of *MA* becomes less significant in Eq. (9) while the coefficient of the interaction $MA \times SOE$ remains significant at the 10% level. Besides, the coefficient of the interaction $AB_ROA \times SOE$ in Eq. (9) is insignificant (see Table 4). Though the moderation effect of state ownership is relatively modest, our results suggest that state ownership mainly affects the relationship between managerial ability and financial performance, thereby moderating the impact of managerial ability on goodwill impairment. Fig. 5 displays the moderation effect of state ownership on the direct and mediation paths in an intuitive way.



Note: It shows how state ownership moderates the link between managerial ability (*MA*) and goodwill impairment incidence (*IMP*). The solid lines and dotted lines indicate the direct effect and indirect effect of *MA* on *IMP*, respectively.

Fig. 5. The direct and mediation effects moderated by state ownership

Specifically, the average direct effect of managerial ability on the likelihood of goodwill impairment is -0.205 for non-SOEs, while the effect basically vanishes ($-0.003 = -0.205 + 0.202$) for SOEs (see the Eq. (6) column of Table 4). Similarly, the average effect of managerial ability on financial performance is 0.307 for non-SOEs while 0.23 for SOEs, which suggests that the positive relationship between managerial ability and financial performance is impaired by companies' state ownership, as discussed in Section 2.3. Due to the impact of state ownership, the estimate results of Eq. (9) show that the effect of managerial ability on the likelihood of goodwill impairment becomes positive ($0.033 = -0.159 + 0.192$) (see Table 4). Overall, the results

support our fourth hypothesis that state ownership significantly moderates the relationship between managerial ability and goodwill impairment.

4.4 Robustness checks

To examine the robustness of our findings, we perform three tests as described below.

First, our sample period contains the 2008 Global Financial Crisis, which caused profound impact on both the economy and the companies. To examine whether the moderated mediation effects in the relationship between managerial ability and goodwill impairment is driven by the crisis, we re-estimate our models for the period of 2010-2017. Table 5 presents the results for the mediation effect of financial performance (see Panel A), the moderation effect of earnings smoothing motivation (see Panel B), and the moderation effect of state ownership (see Panel C). The results show that our findings remain the same.

Second, we examine whether our findings are sensitive to the proxies for managerial ability and financial performance. To this end, we apply the decile rankings of companies' managerial ability (*MARANK*) proposed by Demerjian et al. (2012) as another proxy for managerial ability. This approach can, to some extent, alleviate possible measurement errors in managerial ability scores (Lee et al., 2018). In addition, we use the growth of ROA (ΔROA) instead of the abnormal ROA relative to the industry average ROA to capture corporate performance. Table 6 and Table 7 present the results of our (moderated) mediation models when we use *MARANK* as the explanatory variable and ΔROA as the mediator, respectively. We find that the results are comparable the same as those presented in the previous subsections, which suggests that our findings are not driven by the way to capture managerial ability and financial performance.

Third, we examine whether our findings are sensitive to the way to define the dependent variable. We calculate the ratio of goodwill impairment to total goodwill before impairment (*IMP_GW*) for each company and take it as an alternative dependent variable. In this way, we are able to assess the impact of managerial ability on the magnitude of goodwill impairment with Tobit regressions. We present the results in Table 8 for the mediation effect of financial performance (see Panel A), the moderation effect of earnings smoothing motivation (see Panel B), and the moderation effect of state ownership (see Panel C). Overall, the results appear to support our hypotheses proposed in Section 2 and our findings drawn in the previous subsections.

Table 5. Regression results based on the 2010-2017 period

Note: This table presents the regression results for the period excluding the crisis (i.e., 2010-2017). Panel A, B and C report the test results of the mediating effect of financial performance, the moderating effect of earnings smoothing motivation and property rights, respectively. Continuous variables are winsorized at 1st and 99th percentiles to eliminate the effects of outliers and normalized to eliminate the effect of different dimension. Variables definitions refer to the note of Table 1. ***, ** and * mean statistical significance at the 1%, 5%, and 10% levels, respectively.

Model	Panel A			Panel B			Panel C		
	Eq. (3)	Eq. (4)	Eq. (5)	Eq. (6)	Eq. (7)	Eq. (8)	Eq. (6)	Eq. (7)	Eq. (9)
Dependent Variable	<i>IMP</i>	<i>AB_ROA</i>	<i>IMP</i>	<i>IMP</i>	<i>AB_ROA</i>	<i>IMP</i>	<i>IMP</i>	<i>AB_ROA</i>	<i>IMP</i>
<i>MA</i>	-0.147***	0.254***	-0.114*	-0.198***	0.211***	-0.118**	-0.212***	0.289***	-0.187**
<i>SMOOTH</i>				0.039	0.609***	0.105			
<i>SOE</i>							0.166	-0.047	0.148
<i>MA</i> × <i>SMOOTH</i>				0.127	-0.000				
<i>MA</i> × <i>SOE</i>							0.235*	-0.115***	0.237*
<i>AB_ROA</i>			-0.123*			-0.344***			-0.086
<i>AB_ROA</i> × <i>SMOOTH</i>						0.476***			
<i>AB_ROA</i> × <i>SOE</i>									-0.086
Control variables	Included	Included	Included	Included	Included	Included	Included	Included	Included
Year fixed effect	Included	Included	Included	Included	Included	Included	Included	Included	Included
Industry fixed effect	Included	Included	Included	Included	Included	Included	Included	Included	Included
N	2290	2290	2290	2290	2290	2290	2290	2290	2290

Table 6. Alternative measure of managerial ability

Note: We change the proxy for managerial ability from *MA* to *MARANK*. Panel A, B and C report the test results of the mediating effect of financial performance, the moderating effect of earnings smoothing motivation and property rights, respectively. Continuous variables are winsorized at 1st and 99th percentiles and normalized. Variables definitions refer to the note of Table 1. ***, ** and * mean statistical significance at the 1%, 5%, and 10% levels, respectively.

Model	Panel A			Panel B			Panel C		
	Eq. (3)	Eq. (4)	Eq. (5)	Eq. (6)	Eq. (7)	Eq. (8)	Eq. (6)	Eq. (7)	Eq. (9)
Dependent Variable	<i>IMP</i>	<i>AB_ROA</i>	<i>IMP</i>	<i>IMP</i>	<i>AB_ROA</i>	<i>IMP</i>	<i>IMP</i>	<i>AB_ROA</i>	<i>IMP</i>
<i>MARANK</i>	-0.036*	0.093***	-0.015	-0.047*	0.073***	-0.014	-0.062***	0.100***	-0.042
<i>SMOOTH</i>				-0.272	0.557***	0.033			
<i>SOE</i>							-0.24	-0.075	-0.263
<i>MARANK</i> × <i>SMOOTH</i>				0.036	0.012				
<i>MARANK</i> × <i>SOE</i>							0.085**	-0.022	0.082*
<i>AB_ROA</i>			-0.205***			-0.429***			-0.171**
<i>AB_ROA</i> × <i>SMOOTH</i>						0.504***			
<i>AB_ROA</i> × <i>SOE</i>									-0.056
Control variables	Included	Included	Included	Included	Included	Included	Included	Included	Included
Year fixed effect	Included	Included	Included	Included	Included	Included	Included	Included	Included
Industry fixed effect	Included	Included	Included	Included	Included	Included	Included	Included	Included
N	2698	2698	2698	2698	2698	2698	2698	2698	2698

Table 7. Alternative measure of financial performance

Note: We change the proxy for financial performance from AB_ROA to ΔROA . Panel A, B and C report the test results of the mediating effect of financial performance, the moderating effect of earnings smoothing motivation and state ownership, respectively. Continuous variables are winsorized at 1st and 99th percentiles and normalized. Variables definitions refer to the note of Table 1. ***, ** and * mean statistical significance at the 1%, 5%, and 10% levels, respectively.

Model	Panel A			Panel B			Panel C		
	Eq. (3)	Eq. (4)	Eq. (5)	Eq. (6)	Eq. (7)	Eq. (8)	Eq. (6)	Eq. (7)	Eq. (9)
Dependent Variable	<i>IMP</i>	<i>AB_ROA</i>	<i>IMP</i>	<i>IMP</i>	<i>AB_ROA</i>	<i>IMP</i>	<i>IMP</i>	<i>AB_ROA</i>	<i>IMP</i>
<i>MARANK</i>	-0.143***	0.196***	-0.103*	-0.193***	0.225***	-0.090*	-0.205***	0.254***	-0.159**
<i>SMOOTH</i>				0.028	0.686***	0.290*			
<i>SOE</i>							0.163	-0.094	0.174
<i>MARANK</i> × <i>SMOOTH</i>				0.127	0.101***	0.162			
<i>MARANK</i> × <i>SOE</i>							0.202*	-0.180***	0.167
<i>AB_ROA</i>			-0.125**			-0.414***			-0.081
<i>AB_ROA</i> × <i>SMOOTH</i>						0.440***			
<i>AB_ROA</i> × <i>SOE</i>									-0.137
Control variables	Included	Included	Included	Included	Included	Included	Included	Included	Included
Year fixed effect	Included	Included	Included	Included	Included	Included	Included	Included	Included
Industry fixed effect	Included	Included	Included	Included	Included	Included	Included	Included	Included
N	2698	2698	2698	2698	2698	2698	2698	2698	2698

Table 8. Tobit regression results

Note: The dependent variable is replaced by the ratio of goodwill impairment to total goodwill before impairment (*IMP_MP*) thus we estimate Tobit regressions. Panel A, B and C report the test results of the mediating effect of financial performance, the moderating effect of earnings smoothing motivation and state ownership, respectively. Continuous variables are winsorized at 1st and 99th percentiles and normalized. Variables definitions refer to the note of Table 1. ***, ** and * mean statistical significance at the 1%, 5%, and 10% levels, respectively.

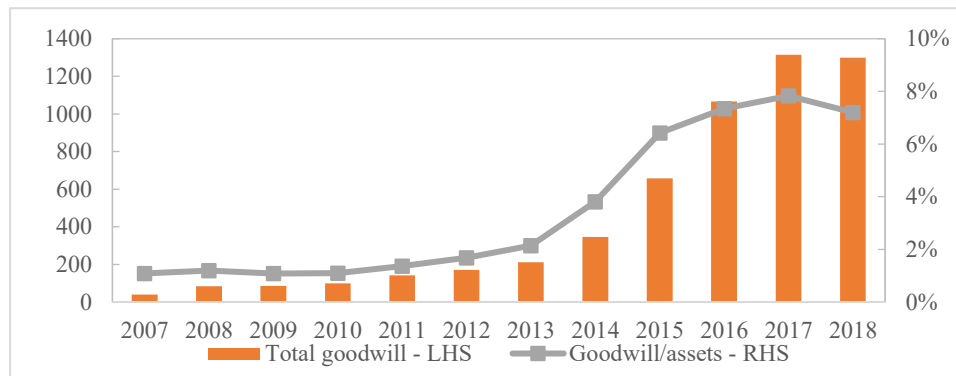
Model	Panel A			Panel B			Panel C		
	Eq. (3)	Eq. (4)	Eq. (5)	Eq. (6)	Eq. (7)	Eq. (8)	Eq. (6)	Eq. (7)	Eq. (9)
Dependent Variable	<i>IMP_GW</i>	<i>AB_ROA</i>	<i>IMP_GW</i>	<i>IMP_GW</i>	<i>AB_ROA</i>	<i>IMP_GW</i>	<i>IMP_GW</i>	<i>AB_ROA</i>	<i>IMP_GW</i>
<i>MA</i>	0.049***	0.279***	-0.040	-0.060***	0.230***	-0.016	-0.068***	0.307***	-0.044**
<i>SMOOTH</i>				0.008	0.781***	0.073*			
<i>SOE</i>							0.090**	-0.111	0.071*
<i>MA</i> × <i>SMOOTH</i>				0.029	-0.027	-0.158			
<i>MA</i> × <i>SOE</i>							0.065*	-0.077**	0.065*
<i>AB_ROA</i>			-0.354***			-0.179***			-0.076***
<i>AB_ROA</i> × <i>SMOOTH</i>						0.175***			
<i>AB_ROA</i> × <i>SOE</i>									0.049
Control variables	Included	Included	Included	Included	Included	Included	Included	Included	Included
Year fixed effect	Included	Included	Included	Included	Included	Included	Included	Included	Included
Industry fixed effect	Included	Included	Included	Included	Included	Included	Included	Included	Included
N	2698	2698	2698	2698	2698	2698	2698	2698	2698

5. Conclusion

Our paper is the first to explore the moderated mediation effects in the relationship between managerial ability and goodwill impairment of Chinese companies. We find robust evidence that corporate financial performance partially mediates the negative effect of managerial ability on the likelihood of goodwill impairment. Moreover, the mediation effect is weakened by companies' earnings smoothing motivation and state ownership. Our results suggest that when a company has the motivation to smooth earnings or is owned by the government, higher managerial ability of the company does not necessarily reduce the likelihood of goodwill impairment. In contrast, the negative effect of managerial ability on the likelihood of goodwill impairment is evident for non-SOEs without earnings smoothing motivation. Overall, our findings are supported by related literature (see AbuGhazaleh et al., 2011; Demerjian et al., 2020; Feng et al., 2019; Glaum et al., 2018; Lee et al., 2018).

Our findings deliver important implications for corporate governance and regulation on goodwill impairment. First, it is worth for firms to enhance the managerial ability in order to avoid goodwill impairment losses. Second, the regulators and investors should also pay attention to other factors such as earnings smoothing motivation and state ownership when analyzing a company's goodwill impairment decision. As our investigation in this paper focuses on Chinese companies, other researchers may follow our methodology to explore the moderated mediation effects in the relationships between goodwill impairment and variables of interest. Doing so will largely enrich the knowledge on companies' goodwill impairment decisions and therefore promote corporate governance and development.

Appendix A. The development of goodwill of Chinese companies



Note: Total goodwill (billion yuan) is calculated as total book value of the goodwill of Chinese publicly listed companies in a given year. Goodwill/Assets indicates the equal-weighted average ratio of goodwill-to-assets of all companies in a given year. Data source: RESSET database and authors' calculations.

Figure A1. Goodwill of Chinese publicly listed companies

Appendix B. Results of two-way fixed-effects models

In Section 4, we use random effects estimation technique to perform our analysis. Here we present the results of *year-firm* two-way fixed effects models, which delivers the same conclusion as reported in Section 4.

Table B1. Fixed effects model

Note: This table reports fixed-effects regression results. Because industry dummies are time-invariant, we exclude them in the fixed-effects regression. Panel A, B and C report the test results of the mediating effect of financial performance, the moderating effect of earnings smoothing motivation and state ownership, respectively. Continuous variables are winsorized at 1st and 99th percentiles and normalized. Variables definitions refer to the note of Table 1. ***, ** and * mean statistical significance at the 1%, 5%, and 10% levels, respectively.

Model	Panel A			Panel B			Panel C		
	Eq. (3)	Eq. (4)	Eq. (5)	Eq. (6)	Eq. (7)	Eq. (8)	Eq. (6)	Eq. (7)	Eq. (9)
Dependent Variable	<i>IMP_GW</i>	<i>AB_ROA</i>	<i>IMP_GW</i>	<i>IMP_GW</i>	<i>AB_ROA</i>	<i>IMP_GW</i>	<i>IMP_GW</i>	<i>AB_ROA</i>	<i>IMP_GW</i>
<i>MA</i>	-0.243***	0.281***	-0.192***	-0.297***	0.242***	-0.189***	-0.306***	0.300***	-0.192***
<i>AB_ROA</i>			-0.186**			-0.398***			-0.140
<i>SMOOTH</i>				0.093	0.576***	0.199			
<i>MA</i> × <i>SMOOTH</i>				0.133	-0.007				
<i>AB_ROA</i> × <i>SMOOTH</i>						0.410***			
<i>SOE</i>							0.131	0.088	0.136
<i>MA</i> × <i>SOE</i>							0.203*	-0.053	0.275*
<i>AB_ROA</i> × <i>SOE</i>									-0.263
Control variables	Included	Included	Included	Included	Included	Included	Included	Included	Included
Year fixed effect	Included	Included	Included	Included	Included	Included	Included	Included	Included
Firm fixed effect	Included	Included	Included	Included	Included	Included	Included	Included	Included
N	2587	2698	2587	2587	2698	2587	2587	2698	2587
Pseudo R ²	15.9%	22.0%	16.2%	16.0%	31.4%	16.8%	16.0%	22.1%	16.2%

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