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Peer effect in the initial recognition of goodwill

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ABSTRACT

This study investigates the peer effect in the initial recognition of goodwill. We find that firms imitate their peers in the initial recognition of goodwill. The higher the tendency for imitation, the higher the proportion of goodwill recognized. Imitation behavior in the initial recognition of goodwill cannot be explained by information acquisition or rivalry motivations. Instead, we find evidence that managers' opportunistic motivations explain the peer effect in the initial recognition of goodwill and the overestimation of goodwill arising from imitation tendencies. Executive overconfidence weakens the peer effect but exacerbates the overestimation of goodwill caused by imitation tendencies. Finally, the higher the imitation tendency, the greater the probability and amount of goodwill impairment in the future. This further confirms that the peer effect leads to overestimation of goodwill. The findings of this study enrich the literature on goodwill and provide insightful empirical evidence for regulating goodwill accounting. The results show that the conservatism principle should be reinforced in the initial recognition of goodwill.

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1. Introduction

With the rapid development of China's economy, mergers and acquisitions (M&As) of listed firms in China have increased dramatically in recent years. M&A transactions are expected to optimize resource allocation and bring economies of scale. While large-scale M&A transactions inject vitality into the capital market, they can also be dangerous: the M&A failure rate is between 70% and 90% (Christensen et al., 2011). One reason for the failure of M&As is their high premium. However, this high premium results in huge goodwill, which becomes a reservoir for M&A risk due to the discretion inherent in the subsequent measurement of goodwill.

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China's goodwill accounting has gone through two stages since 1993, when China restored double-entry bookkeeping system. Before 2006, goodwill was recognized as an intangible asset and amortized within a certain period according to the Chinese Accounting Standards for Business Enterprises (hereinafter, CAS). Since 2007, goodwill has been recognized as a separate asset and is no longer amortized but subject to an annual impairment test. According to CAS 20 – Business Combinations, goodwill is initially recognized as the purchase price (fair value of consideration paid) minus the fair value of the identifiable net assets acquired. After the acquisition, a goodwill impairment test is conducted annually by comparing the carrying value and recoverable amount of goodwill.¹

However, discretion arises in both the initial and subsequent measurement of goodwill. Goodwill can be used to mask irrational M&A decisions and managers' opportunistic behavior. M&A transactions with high premiums and high goodwill are frequently failures. For example, J&R Optimum Energy acquired a lithium battery firm named Watermark for 5.2 billion yuan in 2015, generating goodwill of more than 4.6 billion yuan. Two years later, the goodwill was impaired due to the poor performance of the acquired business.

Since 2008, the amount of goodwill recognized by China's A-share listed firms has grown rapidly, from 53.2 billion yuan in 2008 to 1307.6 billion yuan in 2018, and goodwill impairment risk continues to accumulate. In November 2018, the China Securities Regulatory Commission (hereinafter, CSRC) issued "Accounting Supervision Risk Warning Notice No. 8 – Goodwill Impairment," reminding auditors and asset evaluation agencies of the risks in the initial recognition and subsequent impairment of goodwill. On January 31, 2019, hundreds of listed firms announced loss warnings, most of which were due to vast impairment of goodwill expenses. Goodwill accounting arouses great concern from regulators and capital markets.

Goodwill accounting has also attracted the attention of academia. Discussions focus on its initial recognition and measurement, impairment, and disclosure. However, relevant empirical evidence is still relatively scarce, especially on the initial recognition of goodwill due to the difficulty of obtaining data. The literature finds that acquirers exploit overpriced shares to make more acquisitions, resulting in increasing goodwill (Gu and Lev, 2011). Transaction characteristics are found to be associated with the initial recognition of goodwill. For example, high premiums lead to high goodwill (Bugeja and Loyeung, 2015), share payment is positively related to goodwill (Xie and Zhang, 2013), industry similarity between the acquire and the acquiree is negatively related to goodwill (Zhang and Zhang, 2016), and goodwill is positively correlated with earnings-based bonuses (Shalev et al., 2013). The irrational decision-making of executives is also associated with the growth of goodwill. For example, Li et al. (2018) find that the higher the degree of executive overconfidence, the greater the increase in goodwill. In addition, external appraisers constrain managerial discretion in the initial recognition of goodwill (Zhang and Zhang, 2016).

Uncertainty is common in economic activities. The accounting recognition and measurement of transactions or events with uncertainty requires estimation. Theoretically, accounting estimates are based on objective facts or possible states, using scientific methods. However, due to the high degree of discretion, accounting estimates have become an important tool for corporate financial reporting strategy selection. The fair value of the consideration to be paid or received in a business combination and the fair value of the net assets acquired must be estimated. These estimates determine the amount of initial goodwill recognized, making the subjectivity inherent in estimating goodwill greater than that in most other assets (Ramana and Watts, 2012). The merger premium generated in a business combination can either be recorded as a fair value adjustment that is subsequently amortized or as goodwill that is subsequently subject to impairment tests. The existing research has scarcely investigated the allocation of merger premium between fair value adjustment and goodwill.

In this study, we explore the initial recognition of goodwill in business combinations, focusing on the allocation of the merger premium between goodwill and fair value adjustment. The portion of the M&A premium allocated to fair value adjustment must be amortized periodically in subsequent periods, whereas the portion allocated to goodwill is only subject to an annual impairment test. Compared with periodic amortization, the fair-value-based impairment test is more discretionary. Therefore, executives are more inclined to allocate

¹ Referring to CAS 8 – Assets Impairment.

merger premium to goodwill, leading to an overestimation of goodwill. This is consistent with the traditional opportunistic accounting policy choice theory. We further propose that listed firms refer to their peers' practices in the initial recognition of goodwill, thus providing an excuse for their tendency to overestimate goodwill. The findings in this study corroborate this prediction. We find that firms imitate their peers in the initial recognition of goodwill and that the higher the tendency for imitation, the higher the proportion of goodwill recognized.

The identification of causal relationships between individuals and groups is a major obstacle to studying the peer effect (Manski, 1993). First, recognition of the peer effect requires evidence that there are channels of social interaction between peers. Fortunately, in financial analysis and corporate pricing decisions, the communication of information between individuals and groups does not depend on physical social relationships because the information referenced is publicly available. For example, the calculation of goodwill in business combinations is disclosed in the periodic report of the listed firms. Second, some common behaviors may be caused by endogenous factors and have nothing to do with social communication. To overcome this difficulty, we control the variables of multiple dimensions in the regression analysis, including transaction characteristics, corporate characteristics of the acquirer and acquiree, internal and external corporate governance factors, and industry and year fixed effects. Finally, it is challenging to distinguish between the effect of groups on individuals and the reflective effect of individuals on groups. To alleviate the reflective effect, we use the lagged mean goodwill of other listed firms in the same industry as the main explanatory variable, which partially excludes the individual's reflection on the group.

Lieberman and Asaba (2006) divide imitation behavior between enterprises into two mechanisms: information-based imitation and rivalry-based imitation. As reference to industry practice is an accounting convention, there may be natural motivation for information acquisition in the peer effect in the initial recognition of goodwill. If the motivation for information acquisition is dominant, we will find that the greater the information asymmetry, the greater the peer effect in the initial recognition of goodwill. We use whether an acquirer and acquiree are in the same industry and whether they are in the same region as proxies of information asymmetry but find that the degree of information asymmetry has no effect on the peer effect. Therefore, the information acquisition motivation does not dominate the peer effect in the initial recognition of goodwill. Rivalry-based imitation is less likely because goodwill has a negative effect on future firm performance (Paugam et al., 2015). However, goodwill has an incentive effect on M&As (Gu and Lev, 2011) because it is not subject to compulsory amortization. The incentive effect may be followed by rivals. To check for possible rivalry-based imitation, we look at the degree of industry competition of the acquirer and its effect on imitation in goodwill recognition. The results show no effect, which excludes rivalry-based motivation. In addition, we examine the influence of irrational decision-making on the peer effect in the initial recognition of goodwill—that is, overconfidence. We find that overconfidence can relieve the peer effect, but it exaggerates the overestimation of goodwill caused by imitation.

To further verify the opportunistic motivation of the peer effect in the initial recognition of goodwill, we investigate the effect of internal and external governance mechanisms on the peer effect. First, for ownership characteristics, we find that the higher the largest shareholder's ownership, the more obvious the peer effect, but the presence of foreign investors can suppress the peer effect. Furthermore, management ownership, institutional investor ownership, and foreign investor ownership can alleviate the overestimation of goodwill caused by the peer effect. Second, a high proportion of independent directors and high reputation auditors facilitate the peer effect in the initial recognition of goodwill, which possibly shows their strong dependence on industry benchmarks. A high proportion of independent directors increases the goodwill estimation caused by imitation, but auditors with a good reputation suppress it. In addition, CEO duality fosters the high goodwill estimation caused by imitation, but more analysts following restrains it. Finally, we find that the higher the imitation tendency, the greater the possibility and level of future goodwill impairment. These findings are consistent with the opportunistic explanation of the peer effect in the initial recognition of goodwill.

This study contributes in the following aspects. First, it enriches the research on the determinants of the initial recognition of goodwill. Evidence on the factors influencing the initial recognition of goodwill is scarce, and there is no literature that considers the peer effect. We do so using manually collected data on the allocation of premiums in business combinations. Second, our study investigates accounting policy choices from the perspective of behavioral finance. The uncertainty and discretion in the initial recognition of goodwill

provide an opportunity for the study of behavioral motivation. At present, the peer effect research in corporate finance centers on the effects of institutional investors and managers on investment and financing decision-making. We introduce the peer effect into accounting choice decisions. The research context of this study also provides a natural opportunity to test the peer effect. Third, this study provides empirical evidence for regulators and capital market participants. We find that there is a peer effect caused by opportunistic motivation in the initial recognition of goodwill and that this effect can lead to negative accounting results. The results provide evidence for strengthening the regulation of goodwill accounting. Because imitation tendencies in the initial recognition of goodwill lead to the overestimation of goodwill, accountants should rely more on the conservatism principle in exercising judgment and estimating goodwill.

The rest of this paper is organized as follows: [Section 2](#) presents the theoretical analysis and hypothesis development, [Section 3](#) introduces the research design, [Section 4](#) presents the empirical results, [Section 5](#) reports the robustness tests, and [Section 6](#) concludes the paper.

2. Theoretical analysis and hypothesis development

The peer effect refers to the phenomenon that individual behavior is affected by that of the group, as reflected in the individual's imitation of group behavior. Findings on the peer effect in corporate finance are plentiful. Studies find peer effects in investment decisions ([Foucault and Fresard, 2014](#); [Chen and Ma, 2017](#)), financing decisions ([Leary and Roberts, 2014](#)), M&A decisions ([Wang et al., 2016](#)), capital budget ([Graham and Harvey, 2001](#)), capital structure ([Lu et al., 2017](#); [Zhong and Zhang, 2017](#)), risk aversion ([Ahern et al., 2014](#)), stock split ([Kaustia and Rantala, 2015](#)), and executive compensation ([Zhao, 2016](#)).

In the face of information uncertainty, individuals will pay much to obtain accurate information. It is a relatively better choice to make decisions by imitating peers ([Conlisk, 1980](#)). [Lieberman and Asaba \(2006\)](#) classify the motivations for firm imitation behavior into two categories: information-based and rivalry-based. According to information-based theories, firms follow others that are perceived as having superior information. Under rivalry-based theories, firms imitate others to maintain competitive parity or limit rivalry. Financial decision-making often relies on industry information for reference and verification, which is typical information-based imitation.

Economically, goodwill is the discount of expected future excess profitability ([Ohlson, 1995](#)). In business combinations, the valuation of the target includes a goodwill component that reflects the target's future excess profitability. There is information asymmetry between the acquirer and acquiree in business combinations. In addition, there is uncertainty about the future economic situation and the target firm's operation. Therefore, discretion is used in the valuation of goodwill and the target. In the face of information asymmetry and uncertainty, learning and imitating the goodwill valuation of similar transactions has become an important method, leading to the peer effect in the recognition of goodwill. At the same time, according to current accounting standards, goodwill is recognized as a separate asset and no longer compulsorily amortized. Compared with compulsory amortization, an impairment test of goodwill has less adverse effects on post-acquisition income. This treatment encourages M&A activities and promotes the pace of enterprise expansion ([Gu and Lev, 2011](#)). If this strategy is imitated by rivals, it will generate rivalry-based imitation, which also produces the peer effect.

Based on the above analysis, we propose the peer effect hypothesis in the initial recognition of goodwill:

Hypothesis 1: There is a peer effect in the initial recognition of goodwill; that is, listed firms imitate the allocation ratio of other listed firms in the same industry when they allocate a merger premium to goodwill.

In financial statements, goodwill is "residual value" ([Miller, 1973](#)), which is the remainder of the fair value of the consideration paid minus the fair value of the net assets acquired. In practice, the fair value of the consideration paid is allocated to three items: the book value of the net assets acquired, the fair value adjustment, and goodwill. The sum of the fair value adjustment and goodwill is called the acquisition premium. According to CAS 20 – Business Combinations, the fair value adjustment is determined based on the evaluation value (i.e., fair value) of the net assets of the acquiree on the acquisition date. The consideration paid is also measured at fair value and may include cash and other assets paid, stocks issued, liabilities assumed, and any contingent considerations. Discretion is inherent in estimating both the fair value of the net assets acquired and that of the consideration paid. Given the fair value of the consideration paid and the book value of the assets acquired, the allocation of acquisition premium between the fair value adjustment and goodwill is a trade-off.

Theoretically, both reflect their fair values on the acquisition date. However, subsequent accounting treatments of the two items take different approaches. The fair value adjustment is amortized over the useful life of the corresponding assets or liabilities. Goodwill has no definite useful life, and its economic value does not necessarily decrease; its carrying value is written down only when it is impaired. Compared with periodic amortization, the impairment test is more discretionary. Therefore, executives are more inclined to factor an acquisition premium into goodwill, which leads to the overstatement of goodwill. This also results in a higher risk of subsequent goodwill impairment.

In addition to transaction characteristics, the opportunistic behavior of managers determines the allocation of acquisition premiums to goodwill. For example, Shalev et al. (2013) find that when a CEO compensation package relies more on earnings-based bonuses, they are more likely to allocate to goodwill because goodwill is not amortized compulsorily. The greater the allocation to goodwill, the less negative the effect on subsequent accounting profits will be if goodwill is not impaired. Whether goodwill is impaired is a judgment, and managers have a certain degree of discretion. The overestimation of goodwill caused by opportunistic behavior will be imitated by peers in the presence of the peer effect. Opportunistic managers tend to adopt the goodwill allocation ratio of their peers when that ratio is consistent with their allocation level to prove that their goodwill valuation is reasonable. Therefore, we expect that opportunistic behavior produces a peer effect in the initial recognition of goodwill and that the peer effect is directional; that is, there is a tendency to overestimate goodwill. Based on the above analysis, we propose the second hypothesis as follows:

Hypothesis 2: When determining the proportion of goodwill, the stronger the imitation tendency, the greater the possibility that goodwill is overestimated.

3. Research design

3.1. Sample selection and data sources

CAS 20 – Business Combinations, issued in 2006, stipulates that goodwill is no longer included in intangible assets but is treated as a separate asset and no longer subject to periodic amortization.² Since then, goodwill has been reported separately on the balance sheet. However, in the early years, the number of listed firms that had and reported goodwill were few. Considering the distribution of samples and changes in goodwill accounting standards, we take the M&A events of A-share listed firms in the Wind M&As database between 2010 and 2017 as our initial research sample. We then exclude the following deals: (1) backdoor listings; (2) those in the financial and insurance industry; (3) those labeled as unfinished; and (4) those by firms that suffered from losses in two or three consecutive fiscal years (ST firms and *ST firms). We obtain 1122 observations after this screening. Because most of the target firms are unlisted, we hand-collect their financial data and the transaction characteristics data. The financial data of the acquiring firms are drawn from the China Security Market and Accounting Research (CSMAR) and Wind databases. All of the continuous variables are winsorized at 1% and 99% to eliminate the influence of outliers on the empirical results.

3.2. Empirical model and variable definitions

We construct the following model to test Hypothesis 1:

$$GW_{i,t} = \alpha_0 + \alpha_1 Peer_{i,t-1} + \alpha_2 Controls_{i,t-1} + \varepsilon \quad (1)$$

where the dependent variable $GW_{i,t}$ is the initial goodwill recognition ratio, which is the proportion of the acquisition premium assigned to goodwill on the acquisition date. It is calculated as the initial recognized amount of goodwill divided by the total acquisition premium. The acquisition premium is the difference between the fair value of the consideration paid and the book value of the net assets acquired. The main independent variable $Peer_{i,t-1}$ is the mean initial goodwill allocation ratio in the M&A transactions of other listed firms in the same industry in the previous year.

² Before 2007, goodwill was part of intangible assets and subject to amortization.

In studying the peer effect, it is difficult to distinguish the influence of the group on the individual and the individual's reflective influence on the group. To overcome this difficulty, we use the lagged allocation ratio (previous year) of the group (except the sample firm), which is not affected by the current period behavior of the sample firm (individual). Another challenge in studying the peer effect is that endogenous factors lead to some common behaviors between individuals and groups, and such common behaviors have nothing to do with social communication. To eliminate possible endogenous effects on the imitation behavior between individuals and groups, we control as many factors as possible, including transaction characteristics, acquirer firm characteristics, target firm characteristics, and industry and year fixed effects ($Controls_{i,t-1}$). Specifically, acquirer firm characteristics include agency cost ($Mfee$), firm size ($Size$), debt levels (Lev), operating performance (ROA), and owner type ($State$). Target firm characteristics include firm size ($SizeT$), debt levels ($LevT$), and operating performance ($ROAT$). The transaction characteristics include whether a transaction is a major asset restructuring ($Major$),³ whether it is between related parties ($Related$), and the transaction payment type ($Payment$). See Table 1 for detailed variable descriptions and definitions.

We construct the following model to test Hypothesis 2:

$$GW_{i,t} = \beta_0 + \beta_1 PP_{i,t} + \beta_2 Controls_{i,t-1} + \varepsilon \quad (2)$$

where the dependent variable $GW_{i,t}$ is the ratio of goodwill to acquisition premium on the acquisition date. The independent variable $PP_{i,t}$ is the degree of imitation tendency in the initial recognition of goodwill. $PP_{i,t}$ is measured as the negative of $|GW_{i,t} - Peer_{i,t-1}|$, which is the absolute value of the difference between the initial goodwill recognition ratio of sample firms ($GW_{i,t}$) and the initial goodwill recognition ratio of other firms in the same industry in the previous year ($Peer_{i,t-1}$). To make the results more intuitive, we take the negative of the absolute values. The larger the $PP_{i,t-1}$, the higher the imitation tendency. The control variables ($Controls_{i,t-1}$) are the same as those in Eq. (1), and the variables are defined in Table 1.

4. Empirical analysis

4.1. Descriptive analysis

Table 2 presents the descriptive statistics for the main variables. The mean of the initial goodwill recognition ratio ($GW_{i,t}$) is 0.853, and the mean of the initial goodwill recognition ratio of peer firms ($Peer_{i,t-1}$) is 0.847. Therefore, most of the M&A premium is recognized as goodwill and only a small part (about 15%) is included in the fair value adjustment. The proportion of major asset restructurings, related M&As, different industry M&As, and different region M&As are 31.4%, 29.9%, 52.9%, and 70.2%, respectively. The average proportion of cash payment in M&A transactions is 68.1%. Compared with acquirers, target firms are smaller and have higher leverage and stronger operating performance.

Table 3 reports the Pearson correlation coefficients for the main variables. As shown, the correlation coefficient between the initial goodwill recognition ratio ($GW_{i,t}$) for sample firms and the average of that of peer firms ($Peer_{i,t-1}$) is 0.379, and the correlation is significant at the 1% level. The significant coefficient indicates the peer effect in the initial recognition of goodwill. That is, listed firms imitate their peers in the initial recognition of goodwill. The correlation coefficient of the initial goodwill recognition ratio ($GW_{i,t}$) with the imitation tendency ($PP_{i,t}$) is 0.362 and is significant at the 1% level. Therefore, firms that are apt to imitate their peers allocate a higher proportion of the acquisition premium to goodwill. The results of the correlation coefficient test support Hypotheses 1 and 2. However, in corporate valuation and financial analysis, reference to the industry is a way to verify information. The imitation motivation must be verified by regression analysis controlling various factors.

³ Major asset restructuring refers to transactions in which the purchased or sold assets represent more than 50% of total assets in the latest audited consolidated financial statements; or the purchased or sold assets generating revenue in the latest fiscal year represent more than 50% of revenue reported in the consolidated financial statement for the same period; or the purchased or sold net assets represent more than 50% of net assets in the latest audited consolidated financial statements and are more than 50,000,000 RMB.

Table 1
Variable definitions and descriptions.

Type	Name	Definition and description
<i>Panel A: Main variables</i>		
Dependent variable	<i>GW</i>	The initial goodwill allocation ratio, calculated as the initially recognized amount of goodwill divided by the acquisition premium on the acquisition date
Explanatory variables	<i>Peer</i>	The initial goodwill allocation ratio of peers, calculated as the mean of the initial goodwill recognition ratio in the previous year's M&A transactions of other listed firms (excluding the sample firm) in the same industry
	<i>PP</i>	The degree of imitation in the initial recognition of goodwill, calculated as the negative of the absolute value of the difference between the initial goodwill allocation ratio of sample firms ($GW_{i,t}$) and the mean initial goodwill recognition ratio of other firms in the same industry in the previous year ($Peer_{i,t-1}$)
<i>Panel B: Control variables</i>		
Acquirer characteristics	<i>Mfee</i>	Agency cost, calculated as administrative expenses divided by operating income
	<i>Size</i>	Firm size, the natural logarithm of total assets.
	<i>Lev</i>	Leverage, calculated as total liabilities divided by total assets
	<i>ROA</i>	Profitability, calculated as net income divided by average total assets
	<i>State</i>	A dummy variable that equals 1 if the controlling shareholder is state-owned and 0 otherwise
Target characteristics	<i>HHI</i>	Industry concentration, calculated as the sum of the square of the ratio of each firm's core income to their industry's total core income
	<i>SizeT</i>	Target firm size, the natural logarithm of total assets
	<i>LevT</i>	Target firm leverage, total liabilities divided by total assets
Transaction characteristics	<i>ROAT</i>	Target firm profitability, net income divided by total assets balance
	<i>Major</i>	A dummy variable that equals 1 if the deal is a major asset restructuring and 0 otherwise
	<i>Related</i>	A dummy variable that equals 1 if the deal is a related transaction and 0 otherwise
	<i>Payment</i>	The amount paid in cash divided by the total amount of the transaction
Fixed effects	<i>IndDiff</i>	A dummy variable that equals 1 if the acquirer and acquiree belong to different industries and 0 otherwise
	<i>Distance</i>	A dummy variable that equals 1 if the acquirer and acquiree are registered in different provinces and 0 otherwise
	<i>Bind</i>	The industry of the acquirer
	<i>Tind</i>	The industry of the acquiree.
	<i>Year</i>	Year of acquisition
<i>Panel C: Moderating variables</i>		
Ownership characteristics	<i>Top1</i>	The number of shares held by the largest shareholder divided by the total number of shares
	<i>MShare</i>	The number of shares held by management divided by the total number of shares
	<i>IShare</i>	The number of shares held by institutional investors divided by the total number of shares
	<i>Foreign</i>	A dummy variable that equals 1 if there are foreign investors and 0 otherwise
Corporate governance	<i>BoardInd</i>	A dummy variable that equals 1 if the proportion of independent directors on the board of directors is higher than the median of the year and industry and 0 otherwise
	<i>Dual</i>	A dummy variable that equals 1 if the CEO and board chair are the same person and 0 otherwise
External supervision	<i>Auditor</i>	A dummy variable that equals 1 if the annual ranking of the acquirer's accounting firm is in the top four and 0 otherwise. The rankings are based on the "Comprehensive Evaluation of Accounting Firms" issued by the Chinese Institute of Certified Public Accountants
	<i>Analyst</i>	The natural logarithm of the number of analysts following the acquirer
Management overconfidence	<i>MShareInc</i>	A dummy variable that equals 1 if the number of shares held by management increased not as the result of a share split, rights issue, or stock dividends and 0 otherwise
	<i>OverConf</i>	A dummy variable that equals 1 if the performance forecast is a profit increase or loss reduction but actual net profit is less than predicted and 0 otherwise

Table 2
Descriptive statistics.

Variable	Obs	Mean	Std. Dev	Median	Min	Max
$GW_{i,t}$	1122	0.853	0.395	0.971	-0.953	2.391
$Peer_{i,t-1}$	1122	0.847	0.158	0.878	0.141	1.210
$PP_{i,t}$	1122	-0.215	0.296	-0.116	-1.833	0
$Mfee_{i,t-1}$	1122	0.127	0.088	0.107	0.017	0.489
$Size_{i,t-1}$	1122	21.620	0.964	21.550	19.540	24.880
$Lev_{i,t-1}$	1122	0.367	0.194	0.340	0.058	0.886
$ROA_{i,t-1}$	1122	0.054	0.055	0.050	-0.116	0.242
$State_{i,t}$	1122	0.126	0.332	0	0	1
$HHI_{i,t-1}$	1122	0.054	0.075	0.009	0.008	0.351
$SizeT_{i,t-1}$	1122	18.360	1.794	18.530	13.180	22.520
$LevT_{i,t-1}$	1122	0.536	0.436	0.503	0	3.028
$ROAT_{i,t-1}$	1122	0.061	0.211	0.059	-0.826	0.660
$Major_{i,t}$	1122	0.314	0.464	0	0	1
$Related_{i,t}$	1122	0.299	0.458	0	0	1
$Payment_{i,t}$	1122	0.681	0.380	1	0	1
$IndDiff_{i,t}$	1122	0.529	0.499	1	0	1
$Distance_{i,t}$	1122	0.702	0.457	1	0	1
$TopI_{i,t-1}$	1122	0.324	0.134	0.304	0.051	0.894
$MShare_{i,t-1}$	1108	0.242	0.222	0.225	0	0.671
$IShare_{i,t-1}$	1122	0.094	0.112	0.048	0	0.605
$Foreign_{i,t-1}$	1122	0.081	0.273	0	0	1
$BoardInd_{i,t-1}$	1122	0.471	0.499	0	0	1
$Dual_{i,t-1}$	1117	0.371	0.483	0	0	1
$Auditor_{i,t}$	1122	0.274	0.446	0	0	1
$Analyst_{i,t-1}$	951	1.796	0.983	1.946	0	3.829
$MShareInc_{i,t-1}$	1122	0.142	0.349	0	0	1
$OverConf_{i,t-1}$	815	0.125	0.331	0	0	1

4.2. Empirical results for the baseline model

Table 4 presents the basic regression results. The coefficient on the main explanatory variable $Peer_{i,t-1}$ in column (1) is 0.760 and is significant at the 1% level, showing a strong peer effect in the initial recognition of goodwill. Specifically, the higher the proportion of goodwill allocated by peer firms, the higher proportion of acquisition premium allocated to goodwill by sample firms. Economically, a one-standard-deviation increase in the proportion of peers' goodwill allocation leads to a 12.01% (0.760×0.158) increase in the proportion of goodwill recognized by sample firms. Therefore, listed firms have strong incentive to learn from and imitate their peers in the initial recognition of goodwill. In column (2), the main explanatory variable is imitation tendency ($PP_{i,t}$). The larger the value of $PP_{i,t}$, the more likely it is that the initial recognition of goodwill is aligned with their peers. The coefficient on $PP_{i,t}$ is 0.417 and significant at the 1% level. That is, the higher the tendency for imitation, the higher the proportion of initial goodwill recognition. Economically, a one-standard-deviation increase in imitation tendency results in a 12.34% (0.417×0.296) increase in initial goodwill recognition. The peer effect in the initial recognition of goodwill leads to systemic overestimation of goodwill. The results in Table 4 support both Hypotheses 1 and 2.

4.3. Motivation analysis: Information-based imitation or rivalry-based imitation?

Lieberman and Asaba (2006) argue that there are two main motivations for firms to imitate their peers: information acquisition and maintaining competitive parity. In the process of the initial recognition of goodwill, reference to industry and market benchmarks is a commonly used accounting estimation method, consistent with the information acquisition motivation of corporate imitation. If the peer effect on the initial recognition of goodwill is motivated by information acquisition only, the peer effect will be more significant

Table 3
Pearson correlation coefficients.

	<i>GW</i>	<i>Peer</i>	<i>PP</i>	<i>Mfee</i>	<i>Size</i>	<i>Lev</i>	<i>ROA</i>	<i>State</i>	<i>HHI</i>	<i>SizeT</i>	<i>LevT</i>	<i>ROAT</i>	<i>Major</i>	<i>Related</i>	<i>Payment</i>	<i>IndDiff</i>
<i>Peer</i>	0.379***	1														
<i>PP</i>	0.362***	0.318***	1													
<i>Mfee</i>	0.082***	0.139***	0.113***	1												
<i>Size</i>	-0.198***	-0.254***	-0.230***	-0.395***	1											
<i>Lev</i>	-0.177***	-0.240***	-0.159***	-0.311***	0.551***	1										
<i>ROA</i>	0.143***	0.149***	0.045	-0.080***	-0.032	-0.358***	1									
<i>State</i>	-0.174***	-0.201***	-0.154***	-0.150***	0.376***	0.264***	-0.119***	1								
<i>HHI</i>	0.076**	0.201***	0.170***	0.207***	-0.107***	-0.050*	0.087***	-0.054*	1							
<i>SizeT</i>	-0.096***	-0.167***	-0.089***	-0.173***	0.284***	0.242***	-0.180***	0.219***	-0.095***	1						
<i>LevT</i>	-0.022	-0.009	0.016	0.020	-0.024	0.009	-0.002	-0.016	0.030	-0.062**	1					
<i>ROAT</i>	0.114***	0.137***	0.144***	0.030	-0.061**	-0.064**	0.010	-0.023	0.100***	0.198***	-0.285***	1				
<i>Major</i>	0.086***	0.077**	0.178***	0.119***	-0.219***	0.015	-0.158***	-0.048	0.134***	0.317***	0.034	0.183***	1			
<i>Related</i>	0.036	0.034	0.034	0.089***	-0.105***	0.056*	-0.114***	0.040	0.049	0.217***	0.018	0.066**	0.489***	1		
<i>Payment</i>	-0.080***	-0.138***	-0.174***	-0.069**	0.163***	0.032	0.135***	0.010	-0.063**	-0.224***	-0.007	-0.159***	-0.520***	-0.436***	1	
<i>IndDiff</i>	0.018	-0.018	-0.016	-0.058*	0.030	0.042	-0.102***	-0.078***	-0.186***	-0.085***	-0.039	-0.030	-0.046	-0.037	0.044	1
<i>Distance</i>	0.063**	0.051*	0.043	-0.005	0.026	0.002	0.010	0.023	0.016	0.018	-0.0220	0.085***	0.041	0	-0.013	0.006

Table 4
Peer effect in goodwill recognition.

Dependent variable	$GW_{i,t}$	$GW_{i,t}$
$Peer_{i,t-1}$	0.760*** (8.10)	
$PP_{i,t}$		0.417*** (10.74)
$State_{i,t}$	-0.081** (-2.20)	-0.081** (-2.25)
$Major_{i,t}$	0.041 (1.29)	0.011 (0.33)
$Related_{i,t}$	0.008 (0.30)	0.020 (0.70)
$Payment_{i,t}$	-0.007 (-0.21)	-0.003 (-0.09)
$Mfee_{i,t-1}$	-0.031 (-0.21)	-0.004 (-0.03)
$Size_{i,t-1}$	-0.025 (-1.51)	-0.016 (-0.94)
$Lev_{i,t-1}$	-0.010 (-0.13)	-0.004 (-0.06)
$ROA_{i,t-1}$	0.726*** (3.09)	0.817*** (3.57)
$SizeT_{i,t-1}$	-0.002 (-0.33)	-0.002 (-0.33)
$LevT_{i,t-1}$	-0.007 (-0.26)	-0.010 (-0.41)
$ROAT_{i,t-1}$	0.103* (1.80)	0.081 (1.44)
$_cons$	0.920* (1.89)	1.978*** (4.42)
$Year$	Yes	Yes
$Bind\&Tind$	Yes	Yes
N	1122	1122
$adj. R^2$	0.164	0.198

Note: The t -statistics are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

in M&As with higher information asymmetry. We use two variables to measure the degree of information asymmetry in M&As. Referring to Kohers and Ang (2000), Datar et al. (2001), and Barbopoulos and Sudarsanam (2012), we use whether an acquirer and acquiree are in the same industry ($IndDiff_{i,t}$) as the first measure of information asymmetry. The indicator variable $IndDiff_{i,t}$ equals 0 if the acquirer and the acquiree are in the same industry and 1 otherwise. When the two parties are in different industries, M&A valuation and goodwill estimation are subject to greater information asymmetry.

The closer an investor is to a firm, the easier it is to obtain firm-related information (Loughran, 2008). In contract, the further an investor is from a firm, the higher the degree of information asymmetry (Cai and Jiang, 2013). Therefore, we use whether an acquirer and acquiree are in the same region ($Distance_{i,t}$) as the second measure of information asymmetry; $Distance_{i,t}$ is an indicator variable that equals 0 if the acquirer and acquiree are in the same province and 1 otherwise. When the two are in different provinces, the degree of information asymmetry is higher.

If the information acquisition motivation leads to the peer effect in the initial recognition of goodwill, we will find a more significant peer effect in M&As between different industries and different provinces. Table 5 reports the estimation results of the motivation analysis. In columns (1) and (2) of Table 5, we introduce $IndDiff_{i,t}$ and $Distance_{i,t}$ as explanatory variables, respectively, and include their interactions with $Peer_{i,t}$. If the coefficients of $Peer_{i,t-1} \times IndDiff_{i,t}$ and $Peer_{i,t-1} \times Distance_{i,t}$ are significantly positive, it indicates that

Table 5
Motivation analysis of peer effect.

Dependent variable	$GW_{i,t}$ (1)	$GW_{i,t}$ (2)	$GW_{i,t}$ (3)
$Peer_{i,t-1}$	0.868*** (7.27)	0.739*** (5.45)	0.825*** (6.62)
$Peer_{i,t-1} \times IndDiff_{i,t}$	-0.216 (-1.46)		
$Peer_{i,t-1} \times Distance_{i,t}$		0.025 (0.17)	
$Peer_{i,t-1} \times HHI_{i,t-1}$			-1.247 (-0.78)
$IndDiff_{i,t}$	0.193 (1.50)		
$Distance_{i,t}$		0.011 (0.08)	
$HHI_{i,t-1}$			1.108 (0.77)
$State_{i,t}$	-0.081** (-2.19)	-0.082** (-2.23)	-0.083** (-2.24)
$Major_{i,t}$	0.038 (1.18)	0.039 (1.23)	0.042 (1.31)
$Related_{i,t}$	0.009 (0.33)	0.009 (0.33)	0.011 (0.40)
$Payment_{i,t}$	-0.009 (-0.26)	-0.007 (-0.20)	-0.006 (-0.17)
$Mfee_{i,t-1}$	-0.036 (-0.25)	-0.037 (-0.25)	-0.022 (-0.15)
$Size_{i,t-1}$	-0.025 (-1.50)	-0.026 (-1.54)	-0.025 (-1.46)
$Lev_{i,t-1}$	-0.018 (-0.24)	-0.010 (-0.13)	-0.011 (-0.14)
$ROA_{i,t-1}$	0.723*** (3.07)	0.718*** (3.05)	0.722*** (3.06)
$SizeT_{i,t-1}$	-0.001 (-0.18)	-0.002 (-0.28)	-0.003 (-0.37)
$LevT_{i,t-1}$	-0.007 (-0.28)	-0.007 (-0.26)	-0.006 (-0.23)
$ROAT_{i,t-1}$	0.103* (1.80)	0.097* (1.70)	0.106* (1.84)
_cons	0.764 (1.53)	0.893* (1.82)	0.867* (1.75)
Year	Yes	Yes	Yes
Bind&Tind	Yes	Yes	Yes
N	1122	1122	1122
adj. R ²	0.164	0.163	0.162

Note: The *t*-statistics are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

information asymmetry leads to a stronger peer effect. However, as reported in columns (1) and (2), the coefficients of the intersections are not significant, so the information acquisition motivation alone cannot explain the peer effect in the initial recognition of goodwill.

The more competitive the industry in which a firm operates, the stronger the firm's sense of competition. The rivalry motivation for corporate imitation can be explored by testing whether high industry competition results in a stronger peer effect. We use industry concentration ($HHI_{i,t-1}$) to characterize the degree of competition in an industry and examine whether there is a rivalry motivation using the coefficient of the interaction

of $Peer_{i,t-1}$ and $HHI_{i,t-1}$. The results in column (3) show that the coefficient of the interaction of $Peer_{i,t-1}$ and $HHI_{i,t-1}$ is not significant; therefore, a rivalry motivation cannot be supported.

4.4. Management overconfidence and the initial recognition of goodwill

Management overconfidence is one reason for M&As, and M&As induced by overconfidence result in higher goodwill (Li et al., 2018). The peer effect is a phenomenon in which individual decision-making is influenced by group decision-making. Overconfidence is a source of irrational decision-making. Managers who are overconfident rely more on their own judgment, and their decision-making is less affected by their peers. To validate this prediction, we include management overconfidence and the interaction of management overconfidence and the peer effect in the regression analysis. Specifically, referring to Malmendier and Tate (2005a,b) and Lin et al. (2005), we use two variables to measure management overconfidence. The first considers the situation in which executives increase their holdings of firm stock, $MShareInc_{i,t-1}$. If the number of shares held by management increases and the reason for the increase is not a share split, a rights issue, or stock dividends, $MShareInc_{i,t-1}$ equals 1 and 0 otherwise. The second is a failure to meet optimistic profit forecasts, $OverConf_{i,t-1}$. If a listed firm's performance forecast is a profit increase or loss reduction, but actual net profit at the end of the period is less than predicted, $OverConf_{i,t-1}$ equals 1 and 0 otherwise. Table 6 reports the effect of overconfidence on the initial recognition of goodwill. The coefficients on $MShareInc_{i,t-1}$ and $OverConf_{i,t-1}$ in columns (1) and (4), respectively, are positive, indicating that management overconfidence is positively correlated with the ratio of goodwill recognition. However, in columns (1) and (2), the coefficients on the interactions are significantly negative, indicating that management overconfidence can reduce the peer effect on the initial recognition of goodwill, which is in line with our expectations. In columns (3) and (4), the coefficients on the interactions are significantly positive, indicating that although management overconfidence can mitigate the peer effect, the imitation tendency, if any, still leads to higher goodwill when management is overconfident.

4.5. Management opportunism and the peer effect in the initial recognition of goodwill

The above results show that the information acquisition motivation, the rivalry motivation, and management overconfidence do not explain the peer effect in the initial recognition of goodwill. Under the principal-agent theory, management or internal controllers use accounting policy choice to maximize their own interests. For example, Shalev et al. (2013) find that CEOs with compensation packages that rely heavily on accounting profit are more motivated to over-allocate purchase price to goodwill. Management opportunism leads to the overestimation of goodwill and such behavior induces the peer effect if imitated by peers. Under the information acquisition hypothesis, the peer effect in the initial recognition of goodwill does not lead to systemic overestimation of goodwill. Taking advantage of the accounting treatment of goodwill over that of fair value adjustment, opportunists favor goodwill in the allocation of acquisition premiums. Therefore, our Hypothesis 2 predicts that the peer effect in the initial recognition of goodwill leads to an overestimation of goodwill. In this section, we introduce corporate governance variables as moderators to test whether good corporate governance mechanisms can suppress the peer effect in the initial recognition of goodwill and the overestimation of goodwill thus caused. These tests can further verify that the peer effect is induced by opportunistic behavior.

First, we examine the effects of ownership characteristics. We measure ownership characteristics in four dimensions: largest shareholder ownership ratio ($Top1_{i,t-1}$), management ownership ratio ($MShare_{i,t-1}$), institutional investor ownership ratio ($IShare_{i,t-1}$), and whether there are foreign investors ($Foreign_{i,t-1}$). The largest shareholder ownership ratio proxies for the second type of agency problem (the conflict of interest between a controlling shareholder and minority shareholders). The management ownership ratio proxies for the first type of agency problem (the conflict of interest between shareholders and managers). Institutional investors and foreign investors play a watchdog role, monitoring the controlling shareholder and management. The results of the effect of ownership characteristics on the peer effect in the initial recognition of goodwill are reported in Table 7. As shown, the coefficient on $Top1_{i,t-1}$ is significantly positive, and the coefficient on $Foreign_{i,t-1}$ is significantly negative. The results indicate that the more serious the conflict of interest

Table 6
Executive overconfidence and the initial recognition of goodwill.

Dependent variable	$GW_{i,t}$ (1)	$GW_{i,t}$ (2)	$GW_{i,t}$ (3)	$GW_{i,t}$ (4)
$Peer_{i,t-1}$	0.810*** (8.40)	0.969*** (8.27)		
$Peer_{i,t-1} \times MShareInc_{i,t-1}$	-0.482** (-1.99)			
$Peer_{i,t-1} \times OverConf_{i,t-1}$		-0.493* (-1.66)		
$PP_{i,t}$			0.380*** (9.03)	0.376*** (7.67)
$PP_{i,t} \times MShareInc_{i,t-1}$			0.220** (2.24)	
$PP_{i,t} \times OverConf_{i,t-1}$				0.490*** (4.48)
$MShareInc_{i,t-1}$	0.392* (1.82)		0.040 (1.06)	
$OverConf_{i,t-1}$		0.359 (1.36)		0.076* (1.78)
$State_{i,t}$	-0.083** (-2.24)	-0.099** (-2.08)	-0.083** (-2.30)	-0.113** (-2.47)
$Major_{i,t}$	0.041 (1.28)	0.050 (1.37)	0.009 (0.30)	0.007 (0.19)
$Related_{i,t}$	0.008 (0.28)	0.014 (0.43)	0.015 (0.53)	0.015 (0.50)
$Payment_{i,t}$	-0.008 (-0.22)	0.073* (1.75)	-0.006 (-0.16)	0.072* (1.80)
$Mfee_{i,t-1}$	-0.044 (-0.30)	-0.052 (-0.31)	0.002 (0.01)	-0.073 (-0.46)
$Size_{i,t-1}$	-0.026 (-1.53)	-0.043** (-2.20)	-0.017 (-1.01)	-0.039** (-2.04)
$Lev_{i,t-1}$	0.000 (0.00)	0.043 (0.49)	0.002 (0.02)	0.066 (0.78)
$ROA_{i,t-1}$	0.736*** (3.14)	0.772*** (2.95)	0.825*** (3.60)	0.951*** (3.78)
$SizeT_{i,t-1}$	-0.002 (-0.27)	0.006 (0.67)	-0.002 (-0.30)	0.008 (1.02)
$LevT_{i,t-1}$	-0.006 (-0.24)	-0.006 (-0.20)	-0.010 (-0.39)	-0.008 (-0.29)
$ROAT_{i,t-1}$	0.096* (1.67)	0.056 (0.92)	0.088 (1.57)	0.023 (0.38)
$_cons$	0.842* (1.73)	1.559*** (2.81)	1.991*** (4.46)	1.892*** (3.56)
$Year$	Yes	Yes	Yes	Yes
$Bind\&Tind$	Yes	Yes	Yes	Yes
N	1122	815	1122	815
$adj. R^2$	0.166	0.150	0.201	0.208

Note: The t -statistics are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

between a controlling shareholder and minority shareholders, the more likely the firm is to imitate its peers in goodwill allocation. Nevertheless, the presence of foreign investors inhibits firms from imitating their peers.

Next, we examine the moderating effect of ownership characteristics on the overestimation of goodwill generated by imitation tendencies, and the results are reported in Table 8. As shown, the coefficient on $PP_{i,t-1} * Top1_{i,t-1}$ is not significant, indicating that although a higher proportion of largest shareholder ownership leads to a more serious peer effect, imitation behavior does not induce the overestimation of goodwill. The coefficients on $PP_{i,t} * Mshare_{i,t-1}$, $PP_{i,t} * Ishare_{i,t-1}$, and $PP_{i,t} * Foreign_{i,t-1}$ are all negative, indicating that

Table 7
Ownership characteristics and the peer effect on the initial recognition of goodwill.

Dependent variable	$GW_{i,t}$ (1)	$GW_{i,t}$ (2)	$GW_{i,t}$ (3)	$GW_{i,t}$ (4)
$Peer_{i,t-1}$	0.168 (0.80)	0.765*** (6.72)	0.785*** (6.92)	0.831*** (8.58)
$Peer_{i,t-1} \times Top1_{i,t-1}$	1.732*** (3.08)			
$Peer_{i,t-1} \times MShare_{i,t-1}$		-0.657 (-1.59)		
$Peer_{i,t-1} \times IShare_{i,t-1}$			-0.491 (-0.67)	
$Peer_{i,t-1} \times Foreign_{i,t-1}$				-0.751*** (-2.74)
$Top1_{i,t-1}$	-1.555*** (-3.26)			
$MShare_{i,t-1}$		0.613* (1.70)		
$IShare_{i,t-1}$			0.614 (0.93)	
$Foreign_{i,t-1}$				0.670*** (2.83)
$State_{i,t}$	-0.067* (-1.82)	-0.055 (-1.46)	-0.078** (-2.10)	-0.071* (-1.92)
$Major_{i,t}$	0.044 (1.39)	0.041 (1.27)	0.047 (1.46)	0.043 (1.36)
$Related_{i,t}$	0.012 (0.41)	0.020 (0.70)	0.010 (0.36)	0.007 (0.25)
$Payment_{i,t}$	-0.008 (-0.21)	0.001 (0.04)	-0.004 (-0.12)	-0.003 (-0.08)
$Mfee_{i,t-1}$	-0.029 (-0.20)	-0.032 (-0.22)	-0.050 (-0.34)	-0.041 (-0.28)
$Size_{i,t-1}$	-0.024 (-1.43)	-0.017 (-1.01)	-0.025 (-1.47)	-0.028* (-1.65)
$Lev_{i,t-1}$	-0.008 (-0.10)	-0.018 (-0.23)	-0.012 (-0.16)	-0.004 (-0.06)
$ROA_{i,t-1}$	0.775*** (3.30)	0.689*** (2.94)	0.633*** (2.62)	0.708*** (2.99)
$SizeT_{i,t-1}$	-0.004 (-0.53)	-0.003 (-0.39)	-0.003 (-0.39)	-0.003 (-0.37)
$LevT_{i,t-1}$	-0.010 (-0.38)	-0.004 (-0.15)	-0.006 (-0.22)	-0.005 (-0.20)
$ROAT_{i,t-1}$	0.106* (1.87)	0.117** (2.05)	0.101* (1.77)	0.107* (1.87)
_cons	1.459*** (2.85)	0.704 (1.42)	0.892* (1.82)	0.872* (1.79)
Year	Yes	Yes	Yes	Yes
Bind&Tind	Yes	Yes	Yes	Yes
N	1122	1108	1122	1122
adj. R ²	0.171	0.147	0.165	0.168

Note: The *t*-statistics are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

management ownership, institutional investor ownership, and the presence of foreign investors can restrain the overvaluation of goodwill caused by the peer effect. These results are generally consistent with the opportunistic motivation of the peer effect in the initial recognition of goodwill.

We also examine the effect of other corporate governance mechanisms, including board independence ($BoardInd_{i,t-1}$), CEO duality ($Dual_{i,t-1}$), auditor reputation ($Auditor_{i,t}$), and analysts following ($Analyst_i$,

Table 8
Ownership characteristics, imitation tendency, and the initial recognition of goodwill.

Dependent variable	$GW_{i,t}$ (1)	$GW_{i,t}$ (2)	$GW_{i,t}$ (3)	$GW_{i,t}$ (4)
$PP_{i,t}$	0.314*** (3.24)	0.523*** (10.30)	0.569*** (12.14)	0.477*** (12.16)
$PP_{i,t} * Top1_{i,t-1}$	0.303 (1.14)			
$PP_{i,t} * Mshare_{i,t-1}$		-0.678*** (-3.98)		
$PP_{i,t} * Ishare_{i,t-1}$			-1.902*** (-5.78)	
$PP_{i,t} * Foreign_{i,t-1}$				-0.917*** (-6.50)
$Top1_{i,t-1}$	-0.068 (-0.66)			
$MShare_{i,t-1}$		-0.074 (-1.17)		
$IShare_{i,t-1}$			-0.110 (-0.96)	
$Foreign_{i,t-1}$				-0.164*** (-3.41)
$State_{i,t}$	-0.077** (-2.14)	-0.040 (-1.08)	-0.070** (-1.98)	-0.070** (-1.96)
$Major_{i,t}$	0.011 (0.36)	0.013 (0.40)	0.010 (0.31)	0.014 (0.44)
$Related_{i,t}$	0.021 (0.76)	0.030 (1.07)	0.016 (0.60)	0.009 (0.31)
$Payment_{i,t}$	0.001 (0.03)	0.009 (0.25)	-0.004 (-0.11)	-0.006 (-0.17)
$Mfee_{i,t-1}$	-0.016 (-0.11)	-0.005 (-0.04)	-0.010 (-0.07)	0.023 (0.16)
$Size_{i,t-1}$	-0.016 (-0.95)	-0.008 (-0.50)	-0.018 (-1.13)	-0.019 (-1.18)
$Lev_{i,t-1}$	-0.002 (-0.02)	-0.022 (-0.29)	-0.004 (-0.06)	0.020 (0.26)
$ROA_{i,t-1}$	0.859*** (3.74)	0.751*** (3.31)	0.686*** (2.95)	0.791*** (3.48)
$SizeT_{i,t-1}$	-0.002 (-0.24)	-0.001 (-0.17)	-0.001 (-0.11)	-0.004 (-0.56)
$LevT_{i,t-1}$	-0.010 (-0.39)	-0.006 (-0.25)	-0.008 (-0.33)	-0.014 (-0.57)
$ROAT_{i,t-1}$	0.076 (1.37)	0.098* (1.77)	0.087 (1.57)	0.092* (1.67)
_cons	1.999*** (4.47)	1.763*** (3.93)	2.051*** (4.66)	2.100*** (4.77)
Year	Yes	Yes	Yes	Yes
Bind&Tind	Yes	Yes	Yes	Yes
N	1122	1108	1122	1122
adj. R ²	0.200	0.195	0.224	0.227

Note: The *t*-statistics are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

t_{-1}). Variable definitions are given in Table 1, and the empirical results are presented in Table 9. As shown, the coefficients on $Peer_{i,t-1} \times BoardInd_{i,t-1}$ and $Peer_{i,t-1} \times Auditor_{i,t}$ are significantly positive, whereas the other two interaction coefficients are not significant. High board independence and high auditor reputation result in a greater tendency for imitation in the initial recognition of goodwill. One explanation for the higher imitation

Table 9
Corporate governance and the peer effect on the initial recognition of goodwill.

Dependent variable	$GW_{i,t}$ (1)	$GW_{i,t}$ (2)	$GW_{i,t}$ (3)	$GW_{i,t}$ (4)
$Peer_{i,t-1}$	0.508*** (4.47)	0.705*** (6.54)	0.655*** (6.21)	0.556*** (3.33)
$Peer_{i,t-1} \times BoardInd_{i,t-1}$	0.553*** (3.80)			
$Peer_{i,t-1} \times Dual_{i,t-1}$		0.204 (1.25)		
$Peer_{i,t-1} \times Auditor_{i,t}$			0.322** (2.12)	
$Peer_{i,t-1} \times Analyst_{i,t-1}$				0.109 (1.37)
$BoardInd_{i,t-1}$	-0.530*** (-4.22)			
$Dual_{i,t-1}$		-0.177 (-1.25)		
$Auditor_{i,t}$			-0.261** (-1.98)	
$Analyst_{i,t-1}$				-0.085 (-1.22)
$State_{i,t}$	-0.080** (-2.18)	-0.089** (-2.35)	-0.080** (-2.17)	-0.069* (-1.66)
$Major_{i,t}$	0.050 (1.56)	0.039 (1.19)	0.039 (1.23)	0.038 (1.07)
$Related_{i,t}$	0.008 (0.27)	0.007 (0.24)	0.008 (0.28)	0.012 (0.38)
$Payment_{i,t}$	0.001 (0.03)	-0.005 (-0.13)	-0.009 (-0.24)	0.010 (0.26)
$Mfee_{i,t-1}$	-0.015 (-0.10)	-0.017 (-0.11)	-0.035 (-0.23)	-0.147 (-0.86)
$Size_{i,t-1}$	-0.024 (-1.43)	-0.025 (-1.44)	-0.026 (-1.57)	-0.038* (-1.88)
$Lev_{i,t-1}$	-0.014 (-0.18)	-0.013 (-0.16)	-0.009 (-0.12)	-0.009 (-0.10)
$ROA_{i,t-1}$	0.703*** (3.01)	0.738*** (3.13)	0.688*** (2.91)	0.697** (2.48)
$SizeT_{i,t-1}$	-0.002 (-0.21)	-0.002 (-0.21)	-0.002 (-0.32)	0.001 (0.14)
$LevT_{i,t-1}$	-0.008 (-0.33)	-0.007 (-0.25)	-0.006 (-0.22)	0.014 (0.49)
$ROAT_{i,t-1}$	0.097* (1.71)	0.099* (1.73)	0.102* (1.79)	0.096 (1.58)
_cons	1.086** (2.24)	0.945* (1.91)	0.997** (2.04)	1.268** (2.31)
Year	Yes	Yes	Yes	Yes
Bind&Tind	Yes	Yes	Yes	Yes
N	1122	1117	1122	951
adj. R ²	0.179	0.165	0.166	0.156

Note: The *t*-statistics are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

tendency is that independent directors and auditors are more dependent on industry benchmarks in making decisions to reflect their independence.

Next, we examine the moderating effect of corporate governance characteristics on the overestimation of goodwill caused by imitation tendencies, and the results are shown in Table 10. The coefficients on $PP_{i,t} * BoardInd_{i,t-1}$ and $PP_{i,t} * Dual_{i,t-1}$ are significantly positive, revealing that a high proportion of independent

Table 10
Corporate governance, the peer effect and overestimation of goodwill.

Dependent variable	$GW_{i,t}$ (1)	$GW_{i,t}$ (2)	$GW_{i,t}$ (3)	$GW_{i,t}$ (4)
$PP_{i,t}$	0.158*** (3.09)	0.340*** (7.39)	0.544*** (11.56)	0.637*** (7.29)
$PP_{i,t} * BoardInd_{i,t-1}$	0.533*** (7.46)			
$PP_{i,t} * Dual_{i,t-1}$		0.246*** (3.14)		
$PP_{i,t} * Auditor_{i,t}$			-0.352*** (-4.65)	
$PP_{i,t} * Analyst_{i,t-1}$				-0.151*** (-3.50)
$BoardInd_{i,t-1}$	0.050* (1.93)			
$Dual_{i,t-1}$		0.039 (1.39)		
$Auditor_{i,t}$			-0.048 (-1.63)	
$Analyst_{i,t-1}$				-0.019 (-1.15)
$State_{i,t}$	-0.087** (-2.49)	-0.094** (-2.57)	-0.082** (-2.29)	-0.061 (-1.50)
$Major_{i,t}$	0.014 (0.47)	0.008 (0.25)	0.011 (0.37)	0.017 (0.49)
$Related_{i,t}$	0.032 (1.19)	0.020 (0.70)	0.025 (0.90)	0.008 (0.25)
$Payment_{i,t}$	0.010 (0.29)	0.000 (0.00)	0.000 (0.01)	0.016 (0.42)
$Mfee_{i,t-1}$	0.041 (0.29)	0.031 (0.22)	-0.052 (-0.36)	-0.087 (-0.52)
$Size_{i,t-1}$	-0.012 (-0.74)	-0.013 (-0.78)	-0.014 (-0.83)	-0.040** (-2.01)
$Lev_{i,t-1}$	-0.014 (-0.19)	-0.006 (-0.08)	-0.019 (-0.25)	0.014 (0.16)
$ROA_{i,t-1}$	0.764*** (3.42)	0.833*** (3.64)	0.750*** (3.28)	0.835*** (3.04)
$SizeT_{i,t-1}$	-0.002 (-0.24)	-0.003 (-0.36)	-0.004 (-0.53)	0.002 (0.19)
$LevT_{i,t-1}$	-0.023 (-0.90)	-0.013 (-0.49)	-0.009 (-0.36)	0.007 (0.26)
$ROAT_{i,t-1}$	0.057 (1.04)	0.079 (1.41)	0.079 (1.43)	0.071 (1.19)
_cons	1.709*** (3.92)	1.885*** (4.20)	1.879*** (4.24)	2.234*** (4.50)
Year	Yes	Yes	Yes	Yes
Bind&Tind	Yes	Yes	Yes	Yes
N	1122	1117	1122	951
adj. R ²	0.242	0.205	0.213	0.187

Note: The *t*-statistics are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

directors and CEO duality both exacerbate the overestimation of goodwill caused by imitation tendencies. The coefficients on $PP_{i,t} * Auditor_{i,t}$ and $PP_{i,t} * Analyst_{i,t-1}$ are both significantly negative, indicating that high reputation auditors and analysts following suppress the overestimation of goodwill caused by imitation tendencies. Therefore, internal governance mechanisms exaggerate the overestimation of goodwill, but external governance mechanisms relieve such overestimation. In general, the results based on the moderating effect

of internal and external corporate governance mechanisms are consistent with the opportunistic motivation of the peer effect.

4.6. Imitation tendency and future goodwill impairment

We find that listed firms with a high degree of imitation tendency overestimate goodwill. To further verify that higher goodwill is overvalued, we use the imitation tendency to predict future goodwill impairment. If a high imitation tendency leads to a higher probability of future goodwill impairment and a higher amount of goodwill impairment, the high goodwill caused by the peer effect is overestimated in its initial recognition. To test whether the degree of imitation tendency affects the impairment of goodwill, we construct two variables to measure the impairment of goodwill: the presence of goodwill impairment (*GWI_dum*) and the amount of goodwill impairment (*GWI*). *GWI_dum* examines whether a listed firm reports goodwill impairment in the periods following initial goodwill recognition. The indicator variable *GWI_dum* equals 1 if a firm recognizes goodwill impairment and 0 otherwise. *GWI* is the natural logarithm of the amount of goodwill impairment and takes 0 if a firm does not recognize goodwill impairment. *GWI_dum* and *GWI* are calculated for the four years following initial goodwill recognition. The results are reported in Table 11, in which the dependent variable in Panel A is the presence of goodwill impairment (*GWI_dum*), and in Panel B, it is the amount of goodwill impairment (*GWI*). As Table 11 shows, the degree of imitation tendency is positively correlated with future goodwill impairment. In particular, the probability and amount of goodwill impairment in 3 out of 4 years subsequent to initial recognition are significantly correlated with the imitation tendency. This result further validates the opportunistic motivation of the peer effect in the initial recognition of goodwill. The higher the merger premium allocated to goodwill, the more likely goodwill is to be impaired in the future.

5. Robustness tests

To buttress our empirical results, we conduct a series of robustness tests and report the results as follows.⁴

5.1. Excluding leading industry

Industry distribution in our study shows that the information technology industry accounts for 27.44% of the sample, the largest proportion of any of the industries represented. To exclude the possibility of a dominating industry effect, we exclude the information technology industry from the sample and rerun the empirical tests. The results remain consistent.

5.2. Adding more control variables

To further control possible omitted variable problems, we include all moderating variables in the regression model, and the results remain consistent.

5.3. Controlling policy shocks

CSRC revised the “Measures for the Administration of the Material Asset Restructurings of Listed Companies” in 2014. The main revisions include relaxing the review system, improving the market-based pricing mechanism for issuing shares to purchase assets, improving the definition of backdoor listing, enriching the payment instruments in M&As, eliminating the threshold on the purchase of assets by issuing shares to unrelated third parties and mandatory requirements for profit forecast compensation, enriching the performance guarantee system for tender offer, and specifying a deferential review system. The new measures emphasize in-process and post transaction monitoring, to ensure the parties perform their duties. To alleviate the effect of

⁴ To save space, the tables are omitted here.

Table 11
Imitation tendency and future goodwill impairment.

Panel A	GWI_dum_{t+1}	GWI_dum_{t+2}	GWI_dum_{t+3}	GWI_dum_{t+4}
$PP_{i,t}$	0.089* (1.80)	0.048 (1.02)	0.097*** (2.60)	0.057** (2.28)
$State_{i,t}$	-0.103** (-2.25)	-0.014 (-0.33)	-0.035 (-1.03)	-0.001 (-0.04)
$Major_{i,t}$	-0.070* (-1.86)	0.043 (1.20)	0.053* (1.86)	0.016 (0.85)
$Related_{i,t}$	-0.019 (-0.54)	-0.053 (-1.56)	-0.053** (-1.98)	-0.042** (-2.33)
$Payment_{i,t}$	-0.006 (-0.12)	-0.018 (-0.41)	-0.039 (-1.13)	-0.046** (-2.01)
$Mfee_{i,t}$	0.665*** (2.93)	0.704*** (3.27)	0.388** (2.26)	-0.018 (-0.15)
$Size_{i,t}$	0.043** (2.03)	0.036* (1.82)	0.036** (2.29)	0.001 (0.12)
$Lev_{i,t}$	0.079 (0.78)	0.082 (0.86)	0.017 (0.23)	0.043 (0.85)
$ROA_{i,t}$	-0.357 (-1.00)	-0.345 (-1.02)	0.017 (0.06)	0.189 (1.05)
_cons	-0.187 (-0.32)	-0.985* (-1.78)	-1.038** (-2.34)	-0.103 (-0.35)
Year	Yes	Yes	Yes	Yes
Bind&Tind	Yes	Yes	Yes	Yes
N	1122	1122	1122	1122
adj. R^2	0.079	0.225	0.418	0.567
Panel B	GWI_{t+1}	GWI_{t+2}	GWI_{t+3}	GWI_{t+4}
$PP_{i,t}$	1.393* (1.67)	1.228 (1.50)	1.751*** (2.60)	1.093** (2.35)
$State_{i,t}$	-1.705** (-2.22)	-0.408 (-0.54)	-0.738 (-1.19)	-0.062 (-0.15)
$Major_{i,t}$	-1.001 (-1.57)	1.122* (1.79)	1.276** (2.48)	0.310 (0.87)
$Related_{i,t}$	-0.410 (-0.68)	-0.872 (-1.48)	-0.887* (-1.83)	-0.779** (-2.33)
$Payment_{i,t}$	-0.173 (-0.23)	-0.358 (-0.48)	-0.835 (-1.35)	-1.008** (-2.35)
$Mfee_{i,t}$	11.619*** (3.04)	10.443*** (2.78)	7.025** (2.27)	-0.743 (-0.35)
$Size_{i,t}$	0.872** (2.46)	0.842** (2.42)	0.695** (2.43)	0.042 (0.21)
$Lev_{i,t}$	1.582 (0.93)	0.570 (0.34)	0.480 (0.35)	0.686 (0.73)
$ROA_{i,t}$	-6.806 (-1.13)	-6.426 (-1.09)	0.862 (0.18)	2.895 (0.86)
_cons	-3.917 (-0.40)	-21.786** (-2.25)	-18.775** (-2.35)	-2.654 (-0.48)
Year	Yes	Yes	Yes	Yes
Bind&Tind	Yes	Yes	Yes	Yes
N	1122	1122	1122	1122
adj. R^2	0.085	0.240	0.418	0.563

Note: The t -statistics are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

the new “Measures for the Administration of the Material Asset Restructurings of Listed Companies,” we use the sample from 2015 and beyond to rerun the empirical tests, and the results remain the same.

6. Conclusions

Using the M&As of A-share listed firms, this study examines the peer effect on the initial recognition of goodwill. We find evidence that supports a peer effect on the initial recognition of goodwill. When a firm allocates an acquisition premium, it imitates the treatment of other listed firms in the same industry. This imitation behavior leads to a systemic overestimation of goodwill. We examine the information acquisition and rivalry motivations in peer effect theory. However, these motivations are not supported in the peer effect on the initial recognition of goodwill. We propose that managerial opportunistic behavior produces a peer effect in allocating acquisition premiums, and this hypothesis is verified in our study. We further find that listed firms with a high degree of the second type of agency problem (high ownership by the largest shareholder) are more likely to imitate their peers in the initial recognition of goodwill, but the presence of foreign investors inhibits this imitation. The lower the first type of agency problem, the higher the institutional investor ownership, and the existence of foreign investors can alleviate the overestimation of goodwill caused by the peer effect. In the initial recognition of goodwill, when the proportion of independent directors on the board of directors is higher, there is a stronger imitation tendency, and this imitation tendency promotes the overestimation of goodwill. Therefore, independent directors do not perform their appropriate supervisory and advisory functions in goodwill accounting selection. Although firms audited by high reputation auditors show a higher peer imitation tendency, the high reputation of auditors can restrain the overestimation of goodwill caused by the peer effect. High reputation auditors make more objective professional judgments in referring to industry practice. In addition, CEO duality exacerbates the overestimation of goodwill caused by imitation tendencies. Listed firms with more analysts following have a lower degree of goodwill overestimation caused by imitation tendencies. Executive overconfidence can suppress the peer effect, but it encourages the overestimation of goodwill caused by imitation tendencies. Finally, the higher the imitation tendency in the initial recognition of goodwill, the greater the possibility of future goodwill impairment and the greater the degree of impairment.

The results of this study indicate that there is opportunistic motivation in the initial recognition of goodwill and that this opportunistic behavior is imitated. Market methods in accounting estimation and conformity with industry practice in accounting policy choice disguise such opportunistic motivation. In November 2018, the CSRC issued “Accounting Supervision Risk Warning Notice No. 8 – Goodwill Impairment.” This notice enumerates irregularities in the initial recognition of goodwill including: merger cost measurement error (such as not considering or not correctly considering contingent considerations that should be included in the cost of the acquisition) and under-identification of identifiable assets and liabilities (such as contract rights, customer relations, pending litigations, guarantees) that are owned by the acquiree but not recognized in the financial statements.⁵ These problems call for more standardization and more scientific and professional input into the initial recognition of goodwill. The results of this study echo the regulations and reveal that the conservatism principle should be reinforced in the initial recognition of goodwill to avoid overestimation and reduce future goodwill impairment.

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⁵ Please refer to the CSRC website for the text of the notice: http://www.csrc.gov.cn/pub/newsite/kjb/kjbzcgf/xsjzj/sjgjjgz/201811/t20181116_346845.html.

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