M&A goodwill, investor overreaction and stock price bubbles and collapses

Abstract: Based on the background of the merger and acquisition (M&A) market that has arisen in recent years, we explore whether investors would overreact to M&As and thus triggering stock price bubbles and crashes.Since goodwill only derives from the premium paid by a listed company during M&A, we measure M&A with goodwill and identify the stock price bubbles and crashes caused by M&A over a long period of time. The results imply that: First, goodwill can predict stock price crash risk and the relationship between the two is mainly due to a subsample of companies whose goodwill is relatively high, indicating overvaluation of these companies' stock price. Second, goodwill enhances the company's accounting performance and investors overreact to the M&As, causing the stock price to accumulate bubbles. Third, as post-merger performance decline could be regarded as a sign of overvaluation, the relationship between goodwill and stock price crash risk should be more obvious in this situation. Additional analysis shows that the relationship between goodwill and stock price crash risk is more pronounced when investors have a short investment horizon, when company valuation is high, and when the market conditions are hot. Furthermore, senior executives from companies with high goodwill sell more stocks than those from companies with low or no goodwill, indicating that insiders have utilized the stock price bubble triggered by M&As to achieve wealth transfer. This article enriches the research on the economic consequences of M&As, reflects the unique nature of M&A market in transitional economies and has certain implications for reducing stock price crash risk and maintaining financial market stability.

Question

Finding new growth drivers and preventing and resolving major risks are two important issues in the current Chinese economy. The report of the 19th National Congress of the Communist Party of China pointed out that China's economy has shifted from a stage of high-speed growth to a stage of high-quality development, and it is in a critical period of transforming development mode, optimizing economic structure, and transforming growth momentum. The Central Economic Work Conference held in December 2017 clearly stated that the focus of the work in the next three years is the "three tough battles", and that "preventing and resolving major risks" is the primary goal of the "three tough battles". Mergers, acquisitions and reorganizations have received increasing attention as the main method of resource allocation in the capital market, and have become an important task for the capital market to serve the country's major strategies and the real economy. With the support of relevant policies, the amount of mergers and acquisitions of listed companies in 2015 soared to 1,610 billion yuan, a growth rate of more than 7 times compared to 217 billion yuan in 2014.
. The original intention of the regulators was to hope that listed companies would optimize resource allocation and improve company performance through mergers and acquisitions, but the

negative effects of mergers and acquisitions that caused stock prices to soar and plummet and aggravate market volatility have gradually emerged. Take Quantong Education as an example. When the company resumed trading with a restructuring plan on January 28, 2015, the company's stock price doubled in just 8 trading days. Since then, the stock price has risen all the way and reached an all-time high on May 18, 2015, and then the stock has continued to fall. As of May 25, 2017, the company's stock price fell by as much as 90% from its 2015 high. This is not the only company that ended up plummeting due to soaring share prices in mergers and acquisitions. In this context, this article attempts to explore the source of the asset pricing "anomaly" caused by mergers and acquisitions and restructuring.

This article believes that China's capital market provides an ideal experimental venue for studying bubbles and collapses caused by corporate mergers and acquisitions: (1) As for mergers and acquisitions that use stocks as a payment method, domestic and foreign literature generally finds that the purchaser's stock price will rise significantly before the announcement. This phenomenon may be due to the fact that the acquirer used market misvaluation (Shleifer and Vishny, 2003), manipulated the media to increase its own stock price (Ahern and Sosyura, 2014), or insider trading (Shao Xinjian et al., 2014). At this time, investors can adjust their understanding in time, so the stock price will fall after the announcement of the merger and acquisition, and there will be no obvious bubble. In recent years, Chinese listed companies have mostly completed their acquisitions by means of private placement equity payment, and their share prices have increased significantly after the merger announcement. This is obviously different from the general decline in stock prices after foreign exchange mergers and acquisitions (Savor and Lu, 2009; Fu et al. al., 2013), the post-merger stock price increase may indicate the existence of a bubble. (2) Although the Chinese stock market is constantly developing and improving, the phenomenon that the Chinese capital market is dominated by retail investors has not changed (Bailey et al., 2009). The Chinese stock market is also distinguished from Capital markets in other countries (Pan et al., 2015). In the context of a relatively strong speculative atmosphere in the capital market, many studies have found that investors have speculated on major corporate events such as IPOs, "high-sending transfers", and equity transfers, which has caused the stock price to rise significantly in the short term (Han Liyan and Wu Yanran, 2007; Li Xindan et al., 2014; Wang Huacheng et al., 2010). Based on this speculation, mergers and acquisitions that combine the "eyeball effect" and the effect of improving company performance are likely to trigger investor overreaction and lead to stock price bubbles. (3) The short-selling function of China's margin trading and securities lending is limited due to system design issues. When a company's stock price has a bubble, it is difficult to clear it out in a short period of time, and it is usually released in the extreme form of a plummet (Chu Jian and Fang Junxiong, 2016).

Goodwill is only derived from the premium paid by listed companies during mergers and acquisitions. This article uses goodwill as the annual proxy indicator for company mergers and acquisitions, and draws on the analysis framework of the stock price collapse risk literature, using the following findings to identify bubbles and collapses caused by mergers and acquisitions: (1) A bubble refers to the phenomenon that the price of an asset exceeds the fundamental value (Xiong and Yu, 2011). However, the fundamental value is difficult to accurately measure. Scholars generally regard the subsequent collapse as a necessary condition for judging a stock price bubble (Bhattacharya and Yu, 2008; Xiong , 2013). This paper finds that goodwill is positively correlated with the risk of stock price collapse, and the correlation between the two is mainly derived from

samples with higher goodwill, which initially indicates that the stock price of companies with higher goodwill may have a certain degree of bubble. (2) Goodwill has increased the company's return on total assets in the current and next period, but the promotion of goodwill on stock price performance is only significant in the current period and the magnitude is greater than the promotion of the return on total assets, indicating that investors are The positive reaction to mergers and acquisitions has caused a bubble in stock prices. (3) Declining performance is used as a sign to judge whether there is a bubble in stock prices. This article finds that the relationship between goodwill and the risk of stock price collapse is more obvious when performance is declining (Demarzo et al., 2008). The regression results of the sub-samples show that the impact of goodwill on the risk of stock price collapse is more obvious when investors have shorter holding periods, higher company valuations, and better market conditions, further indicating that goodwill aggravates the risk of stock price collapse. mechanism. At the same time, when the leverage ratio and earnings manipulation were used to measure the motivation and degree of management to hide negative news, it was found that the impact of goodwill on the risk of stock price collapse was more pronounced when the leverage ratio was high, while in companies with different degrees of earnings manipulation. There is no obvious difference, which partially supports management's hiding of negative news is also a mechanism by which goodwill exacerbates the risk of collapse. In addition, this article also finds that the reduction ratio of senior executives of high-goodwill companies is significantly higher than that of companies with low or no goodwill, indicating that the management has used the stock price bubble triggered by mergers and acquisitions to reduce their holdings at a high level, thereby realizing the transfer of wealth.

This article may enrich the existing literature in the following five aspects: (1) Provide a new research perspective on the economic consequences of mergers and acquisitions. In the past, the literature mostly studied mergers and acquisitions from the perspective of the market reaction on the announcement day (Netter et al., 2011; Pan Hongbo and Yu Minggui, 2011). This article uses investors' overreaction to mergers and acquisitions as the starting point, and is the asset that caused the merger and acquisition to cause stock price bubbles and collapses. The "anomaly" of pricing provides microscopic evidence from emerging markets. (2) Enriched the understanding of the relationship between stock price bubbles and corporate mergers and acquisitions. Foreign studies have only found a one-way relationship between stock price bubbles and corporate mergers and acquisitions, that is, when the stock price is overvalued, listed companies will use equity financing to implement mergers and acquisitions (Shleifer and Vishny, 2003; Ahern and Sosyura, 2014). Mergers and acquisitions will cause a stock price bubble due to investors' overreaction, and management uses the stock price bubble to realize wealth transfer. (3) Provides a new supplement to the literature on the risk of stock price collapse from the company level. A company-level stock price crash includes two parts: a stock price bubble and a concentrated release of negative news. Most studies use the occurrence of the crash to verify the management's behavior of "covering" the negative news and its influencing factors (Meng Qingbin et al., 2017; Lin Le and Zheng Dengjin, 2016). The above literature all regards the existence of a stock price bubble before the crash as a self-evident assumption and believes that management's hiding of negative information is an important reason for the stock price bubble. This article starts from the major investment decision of listed company mergers and acquisitions, and points out the cause of another stock price bubble from the perspective of investor overreaction, and deepens the research in this field on the premise that the logic is consistent with the existing literature. (4)

Enriched research related to goodwill. The current literature on goodwill mostly focuses on exploring the connotation of goodwill (Du Xingqiang et al., 2011), the influencing factors of goodwill (Li et al., 2011; Olante, 2013), and the occurrence of goodwill impairment and its economic consequences (Li et al., 2011), this article points out that the stock prices of companies with higher goodwill may contain more bubble components, which enriches the understanding of goodwill from the perspective of asset pricing. (5) Enriched the relevant literature on investor overreaction. In the past, this kind of literature mostly used the reversal effect of stock prices to prove the existence of the psychological feature of overreaction. This article shows that investors also have overreaction when facing corporate mergers and acquisitions, and this overreaction will affect the stability of the capital market.

Background introduction, literature review and research hypothesis

1. Accounting treatment of goodwill

In 2007, the Ministry of Finance promulgated the new Accounting Standards for Business Enterprises. The new standard No. 20 "Business Combinations" stipulates: "The difference between the purchaser's merger cost and the fair value of the acquiree's identifiable net assets in the merger shall be recognized as a business Reputation." According to the Accounting Standards for Business Enterprises, the accounting treatment involving business mergers should first distinguish whether the two parties to the merger are the same actual controller. Only for a business combination in which both parties to the merger are not the same actual controller, the portion of the listed company's payment in excess of the fair value of the acquired asset is included in the goodwill. In other words, the asset injection behavior of major shareholders will not change the company's goodwill. Only when the listed company implements unrelated market-oriented mergers and acquisitions can the premium paid be included in the goodwill, so goodwill is equivalent Premium paid in market-oriented mergers and acquisitions of listed companies

2. Literature review

(1) Related research on goodwill. At present, the research on goodwill mostly focuses on whether goodwill is overestimated and its causes, and the occurrence and consequences of goodwill impairment (Du Xingqiang et al., 2011; Li et al., 2011; Olante, 2013). The impact of goodwill on the company's asset pricing. So far, only Wang Wenjiao et al. (2017) have discussed the role of goodwill in predicting the risk of future stock price collapse, but they fully explain the relationship between the two from the perspective of accounting information, and believe that accounting conservatism and management's manipulation of goodwill assets can be Explain the impact of goodwill on the risk of stock price collapse. However, they did not find that goodwill exacerbated the risk of stock price crashes in the samples with lower accounting robustness. In addition, although they found that the impact of goodwill on the risk of stock

price collapse is more obvious in the samples followed by analysts and institutional investors, this does not necessarily mean that external governance factors can limit management's manipulation of goodwill assets. It may be that the stock prices of companies with poor external governance mechanisms are more likely to generate bubbles due to speculative trading, and they do not distinguish this. This article believes that higher goodwill means a greater degree of bubble in stock prices, and the bubble in stock prices stems from investors' overreaction to mergers and acquisitions. It is more convincing to explain from the perspective of investor behavior.

(2) Related research on investor overreaction. Overreaction from the perspective of behavioral finance refers to the fact that when faced with an uncertain emergency, investors will violate Bayes's law due to psychological cognitive deviations, which will cause asset prices to fall or rise, and wait until investors gradually understand the event. After the true meaning, the price will reverse and eventually return to a reasonable pricing range (Barberis et al., 1998). The phenomenon of investor overreaction in the face of policy introduction, information disclosure or unexpected events has been found in the stock market (Bondt and Thaler, 1985), the national debt market (Fleming and Remolona, 1999) and the real estate market (Deng Guoying et al., 2010). verification. In short, the current literature on investor overreaction focuses on demonstrating the widespread existence of such effects in different markets. This article examines the bubbles and collapses caused by investors' overreaction to mergers and acquisitions from the perspective of asset pricing.

(3) Research on the relationship between bubbles and the risk of stock price collapse. Asset price bubbles refer to the phenomenon that asset prices exceed fundamental value (Demarzo et al., 2008; Xiong and Yu, 2011). Because any model that measures the fundamental value of a company may have the problem of missing variables, which makes it difficult to accurately measure the fundamental value, scholars have taken "the collapse of the stock price after a large increase" as a necessary condition for defining a bubble (Bhattacharya and Yu, 2008; Xiong, 2013). Historically, the collapse of some famous bubbles is usually unpredictable beforehand and occurs in a very short period of time (Xiong, 2013). This means that the bubble and the collapse go hand in hand, and the subsequent collapse is a necessary condition for judging the bubble.

The current literature on the research of crash risk is mainly conducted from the market level and the company level. Based on the market-level literature that studies the risk of stock price crashes, the focus is on explaining that the imperfection of the short-selling mechanism and the heterogeneity of investors make negative news unable to be reflected in the stock price, causing stock prices to be overvalued. When the company is hit by negative news, it may appear Everyone sells the company's stock at the same time, which triggers the risk of stock price collapse (Hong and Stein, 2003; Chang et al., 2007). Research based on the company level mainly interprets the risk of stock price collapse from the perspective of agency theory and information asymmetry. The agency problem leads to the risk of stock price collapse. It means that the management will manage the negative news of the company for the motives of building a corporate empire, corporate tax avoidance, option incentives, and political promotion, until the negative news cannot be covered up, and then it will cause the risk of stock price collapse (Kothari et al., 2009; Kim et al., 2011a, 2011b; Piotroski et al., 2015). Opaque information provides some convenience for management to "cover" negative news.

Therefore, opaque information will also exacerbate the risk of stock price collapse (Jin and Myers, 2006; Hutton et al., 2009).

However, the literature that studies the risk of stock price crashes based on the market and company levels is based on a very strong assumption that there is a bubble in the stock price before the crash. The former type of literature believes that the imperfect market trading mechanism is the cause of the stock price bubble (such as short-sale constraints), while the vast majority of studies in the latter type of literature believe that the management's "covering" of negative information is the cause of the stock price bubble. , And use the centralized disclosure of negative news to trigger the stock price collapse to verify the management's behavior of hiding negative information and its influencing factors. In addition to Chen et al. (2001), Chu Jian, and Fang Junxiong (2016) clearly pointed out that bubbles are a mechanism that exacerbates stock price collapses, although other literature on collapse risks also involves or implies that stock price bubbles will exacerbate future collapse risks, these studies are more important. It focuses on explaining the crash from the "covering" and exposure of negative news (Xu Nianxing et al., 2012).

3. Research hypothesis

Crash risk includes two parts: overvaluation of stock price and concentrated release of negative news (Chang et al., 2017). Drawing lessons from the research framework of corporate-level stock price collapse risk literature, this article proposes that investors may overreact to listed companies' mergers and acquisitions, which may lead to stock price bubbles and aggravate the risk of subsequent stock price collapses.

Although A-shares have developed into the world's second largest stock market in terms of total market value, the investor structure of A-shares dominated by retail investors has not changed, which makes the market's speculative atmosphere still relatively strong (Bailey et al., 2009; Pan et al., 2015). The market with retail investors as the mainstay has relatively high investor heterogeneity, and frequent speculative transactions of "chasing the rise and killing the fall" make the Chinese stock market prone to bubble formation (Scheinkman and Xiong, 2003; Xiong and Yu, 2011).

Studies have shown that investors have shown speculative behavior in major events such as IPOs, equity transfers, and stock dividends of listed companies (ie, "high delivery and transfer") (Han Liyan and Wu Yanran, 2007; Li Xindan et al., 2014; Wang Huacheng et al., 2010), making the company's stock price rise significantly in the short term. Similar to the above events, in addition to attracting investors' attention, mergers and acquisitions, as a major event of the company, under the background of the rapid rise of the A-share mergers and acquisitions market in recent years, mergers and acquisitions of companies that optimize the allocation of stock resources may, in nature, improve the company's performance . For example, Zheng Haiying et al. (2014) used goodwill to measure the company's mergers and acquisitions and found that the merger goodwill improved the company's performance in the short term. Although it is not ruled out that a small number of people may learn about mergers and acquisitions in advance, most participants in the market often have difficulty predicting the occurrence of mergers and acquisitions in advance, and in hindsight, mergers and acquisitions have generally improved the company's performance. Therefore, in nature, M&A

events can be classified as sudden positive events, in which case investors are prone to overreact to M&A.

The characteristics of mergers and acquisitions that require administrative approval and the financing methods of private placement may make the stock price overvalued for a long period of time, creating conditions for this article to study the bubbles and collapses caused by mergers and acquisitions in an annual period. The mergers and acquisitions of listed companies in China require a long time for administrative approval. The repeated and continuous "fermentation" of favorable information about mergers and acquisitions can easily push up stock prices. Listed companies mostly use private placement as a financing method during mergers and acquisitions. When the merger is officially announced, the newly issued shares will have a one-year or three-year lock-up period depending on whether the major shareholder participates. The lock-in of new shares eliminates a large number of new shares in the short term. Increase the downward pressure on the stock price caused by the stock sell-off.

In addition, due to the systematic deviation of the selection criteria and the asymmetry of the margin trading function of the A-share margin trading system, the short-selling mechanism is limited (Chu Jian and Fang Junxiong, 2016). The systemic institutional problems of margin trading and securities lending make it difficult to clear the stock price of A-share listed companies in a short period of time after the stock price has accumulated, and it is usually released in the extreme form of stock price collapse.

From the above analysis, it can be seen that the speculative trading atmosphere of A shares makes it easy for investors to overreact to mergers and acquisitions, a major event that improves the company's fundamentals. At the same time, the long administrative approval process and the restricted circulation of new shares during the lock-up period are all The rise in stock prices creates favorable conditions, which makes stock prices prone to bubbles. Goodwill is used as the proxy indicator of corporate mergers and acquisitions, based on the logic chain of "M&A-investors expect the company's performance to improve-overreaction to positives-stock price bubble-the bubble cannot be sustained and eventually collapsed"

Hypothesis 1: There is a positive correlation between goodwill and the risk of stock price collapse.

Under normal circumstances, different investors have different judgments on the fundamental value, and it is difficult to accurately identify whether there is a bubble in the stock price. A feasible way is to use the change in the company's profitability to judge the change in its fundamental value. Theoretical research pointed out that when the company's performance declines, the company's stock price is higher than the discounted value of the expected cash flow. At this time, it can be considered that there is a bubble in the stock price (Demarzo et al., 2008). Empirical studies at home and abroad have also found that the risk of stock price collapse has an inverse relationship with changes in company performance, which indicates that investors will judge whether stock prices are overvalued based on changes in company performance. Lin Le and Zheng Dengjin (2016) found that under the effect of delisting supervision, an external governance mechanism, companies that were warned would work hard to improve their performance and reduce the risk of stock price collapse. Chang et al. (2017) found that the extreme negative value of the weekly stock price return is usually

accompanied by the forecast of performance decline, which is mainly caused by the large number of company stocks being sold by institutional investors with short holding periods. Institutional investors with a short holding period will sell a large number of company stocks when the company's performance declines, indicating that they believe that the decline in performance can be regarded as a signal of overvaluation of the stock price. Based on the same logic, if the company's performance declines after the merger.

Hypothesis 2: When the company's performance declines after the merger, the positive correlation between goodwill and the risk of stock price collapse becomes more obvious.

4. Research and design

1. Sample selection

This article takes the listed companies in Shanghai and Shenzhen stock exchanges from 2007 to 2015 as the research object, and the data used are all from the CSMAR database. The goodwill of listed companies began to appear in 2007, so the sample of this article began in 2007. At the same time, the research of this article needs to use the stock price trading data and financial data of the next year. The financial data for 2017 has not yet been released, so the sample in this article is as of 2015. The initial data are processed as follows: (1) Exclude financial listed companies; (2) Refer to Jin and Myers (2006), and exclude samples with less than 30 trading weeks per year in order to effectively estimate the risk of stock price collapse; (3) Delete Data is missing samples. According to the above criteria, 14842 observations were finally obtained. In order to eliminate the influence of extreme values, Winsorize is performed on all continuous variables in the model at the 1% level. At the same time, this paper performs a corporate dimension clustering process (Cluster) on the standard errors in all regressions to control potential cross-sectional related issues (Petersen, 2009).

2. Selection and description of variables

(1) The explained variable. The explained variable in this article is the risk of stock price collapse. Referring to the existing literature (Chen et al., 2001; Kim et al., 2011a, 2011b; Xu Nianxing et al., 2012), the explained variable indicators are constructed using the following steps:

(2)
$$R_{i,t} = \alpha_i + \beta_1 R_{m,t-2} + \beta_2 R_{m,t-1} + \beta_3 R_{m,t} + \beta_4 R_{m,t+1} + \beta_5 R_{m,t+2} + \varepsilon_{i,t} \qquad (1)$$

Among them, Ri, t refers to the return rate of stock i in the t week considering the cash dividend reinvestment, and R refers to the average return rate weighted by the market value of all A shares in the t week. In this paper, the two-period market rate of return is added to the equation (1) to alleviate the deviation caused by the asynchrony of transactions (Dimson, 1979). Define the weekly trait return rate Wi, t=ln (1+εi, t), where εi, t are the regression residuals of equation (1).

Secondly, construct two indicators to measure the risk of stock price collapse on the basis of the company's weekly characteristic return rate. One is to use the Negative Return Skewness Coefficient (NCSKEW) to measure the risk of stock price collapse. The specific formula is:

$$NCSKEW_{i,t} = -[n(n-1)^{3/2} \sum W_{i,t}^3] / [(n-1)(n-2)(\sum W_{i,t}^2)^{3/2}] \qquad (2)$$

In formula (2), n is the number of trading weeks of stock i in a certain year. The larger the value of NCSKEW, the larger the negative return skewness coefficient and the higher the risk of stock price collapse.

The second is to use the rate of return up and down fluctuations (DUVOL) to measure the risk of stock price crashes. For each company and year, first define the week where the trait return rate is less than the average value as a down week, and the week where the trait return rate is higher than the average value as an up week. Then calculate the standard deviations of the trait yields for the falling week and the rising week respectively, and get the falling volatility and the rising volatility. Finally, divide the falling volatility by the rising volatility and take the natural logarithm to obtain the DUVOL indicator for each company and annual sample. Calculated as follows:

$$DUVOL_{i,t} = \log\{[(n_u - 1) \sum_{down} W_{i,t}^2] / [(n_d - 1) \sum_{up} W_{i,t}^2]\} \qquad (3)$$

In formula (3), nu and nd represent the weekly specific rate of return Wi of company i's stock price, respectively, and t is greater than and less than the number of weeks of its annual average rate of return W. The larger the value of DUVOL, the more left the distribution of the return rate, and the greater the risk of stock price collapse.

(2) Explain variables. In order to judge whether the post-merger stock price rise is partly due to investor overreaction, this article needs to find an annual indicator that can simultaneously characterize the impact of mergers and acquisitions on company performance and company stock prices. This article uses the adjusted goodwill value (SYt) of total assets as the main explanatory variable. Goodwill originates from the premium paid during mergers and acquisitions. The inclusion of goodwill in the accounting statements means that listed companies have implemented mergers and acquisitions. After a listed company implements mergers and acquisitions, if investors over-react to mergers and acquisitions and make the company's stock price bubble for a longer period of time, the goodwill that is included in the accounting accounts afterwards can portray the stock price bubble to a certain extent.

Taking goodwill as the proxy indicator for mergers and acquisitions is reasonable as follows: (1) Considering the size of the company, the number of mergers and acquisitions carried out by the same company, and the difference in the degree of improvement of the company's fundamentals by different mergers and acquisitions, the goodwill after adjustment of total assets is It is more comparable between different companies. (2) In recent years, most of the mergers and acquisitions of listed companies have used private companies as the target companies for mergers and acquisitions, and it is difficult to find detailed information on a single merger and acquisition transaction in the public database,

and goodwill can be used as an agent indicator of mergers and acquisitions to use company-annual data At the same time, it discusses the different effects of mergers and acquisitions on company performance and stock price performance, which proves that investors have overreacted to mergers and acquisitions. (3) Although goodwill may be impaired, on the one hand, the scale of goodwill impairment during the sample period of this article is relatively small

(3) Control variables. With reference to the previous literature (Kim et al., 2011b; Xu Nianxing et al., 2012), the following control variables are selected: company size (Size), Tobin Q value (Tobin Q), return on total assets (ROA), and debt to assets ratio (Lev); Trend-adjusted stock turnover rate (Turn), that is, the difference between the stock's monthly average turnover rate of the current year and the previous year's average monthly turnover rate; the company's adjusted weekly return rate (Ret) and standard deviation (Sigma); Corporate Transparency (ABACC), using the absolute value of manipulable accrued earnings, in which manipulable accrued earnings is estimated by the revised Jones model; last year's negative corporate earnings skewness coefficient (NCSKEW), using To control the continuity of the third-order moment characteristics of the rate of return in time. In addition, it also controls the fixed effects of the year (Year) and the industry (Ind).

3. Research model

This article uses model (4) to test whether M&A goodwill affects the risk of stock price collapse:

$$CrashRisk_{i,t+1} = \beta_0 + \beta_1 SY_{i,t} + \gamma Controls_{i,t} + \varepsilon_{i,t} \qquad (4)$$

Among them, Crash Riski, t+1 are respectively measured by NCSKEWt+1 and DUVOLt+1, SYi, t represents the goodwill value adjusted by total assets in period t. Controlsi, t is the corresponding control variable, used to control other factors that may trigger a stock price crash (3)

3. Empirical results

1. Descriptive statistics and testing of differences between groups

The results of descriptive statistics show that the mean values of the two stock price collapse risk indicators NCSKEWt+1 and DUVOLt+1 are -0.260 and -0.240, respectively, and the standard deviations are 0.920 and 0.740, respectively, indicating that these two indicators are quite different in different companies. . The average value of goodwill (SYt) is 0.005, which is greater than the median of 0.000, indicating the biased distribution of goodwill. Only 21.7% of the companies and annual samples have accumulated goodwill through mergers and acquisitions. The standard deviation of SYt is 0.020, indicating the unbalanced distribution of goodwill, which means that some companies in the sample with goodwill have significantly higher goodwill.

2. Goodwill exacerbates the risk of stock price collapse: verify hypothesis 1

Table 1 verifies whether goodwill exacerbates the risk of stock price collapse. The explained variable in columns (1)-(3) is NCSKEWt+1, and in column (1) only the main

explanatory variable goodwill (SYt) is added. The regression results show that the coefficient of goodwill is positive and at the level of 1% After adding other control variables that affect the risk of stock price collapse except the information transparency indicator (ABACCt) in column (2), it is found that the coefficient of goodwill is still positive and significant at the level of 1%; due to Jin and Myers (2006) and Hutton et al. (2009) pointed out that information transparency has an important impact on stock price crashes. After further controlling the information transparency indicator (ABACCt) in column (3), the sign and significance of goodwill remain consistent. In the regression of columns (4)-(6), when DUVOLt+1 is used as the dependent variable, although the significance of the regression coefficient decreases slightly, the conclusion that goodwill exacerbates the risk of stock price collapse remains unchanged. The results in Table 1 indicate that goodwill will exacerbate the risk of stock price collapse. However, the distribution of goodwill in the sample in this article is highly biased, which indicates that a small number of companies have accumulated high goodwill through mergers and acquisitions (2). Does goodwill necessarily trigger the risk of stock price collapse, or does the scale of goodwill have to exceed a certain level? In order to answer this question, this article arranges samples with goodwill greater than 0 in order from small to large, with 25% points per share. The number of digits grouped goodwill and generated four dummy variables Q1—Q4, and replaced goodwill with the intersection of these four dummy variables and goodwill as the main explanatory variable for regression.

Linear regression

Number of obs	=	14,842
F(34, 2417)	=	57.06
Prob > F	=	0.0000
R-squared	=	0.1370
Root MSE	=	.85576

(Std. Err. adjusted for 2,418 clusters in stkcd)

F_NCSKEW	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
SY_ratio	1.731863	.3476566	4.98	0.000	1.050128	2.413599
_Iyear_2008	-.204338	.0298704	-6.84	0.000	-.2629123	-.1457637
_Iyear_2009	.0419068	.0288307	1.45	0.146	-.0146286	.0984422
_Iyear_2010	.1209582	.0292355	4.14	0.000	.063629	.1782874
_Iyear_2011	-.0173986	.0303036	-0.57	0.566	-.0768224	.0420252
_Iyear_2012	-.3623631	.0268537	-13.49	0.000	-.4150217	-.3097045
_Iyear_2013	.7645595	.0304988	25.07	0.000	.7047529	.824366
_Iyear_2014	-.0311723	.0270483	-1.15	0.249	-.0842125	.021868
_Iyear_2015	-.0515968	.0291289	-1.77	0.077	-.108717	.0055234
_Iind_2	.0604672	.0638979	0.95	0.344	-.0648331	.1857675
_Iind_3	.1329454	.0564115	2.36	0.019	.0223255	.2435653
_Iind_4	.1330161	.0543024	2.45	0.014	.026532	.2395001
_Iind_5	-.0297321	.0535436	-0.56	0.579	-.1347282	.0752639
_Iind_6	.1572239	.0645799	2.43	0.015	.0305862	.2838616
_Iind_8	-.0187152	.0716006	-0.26	0.794	-.1591201	.1216898
_Iind_9	.0625979	.0535989	1.17	0.243	-.0425066	.1677024
_Iind_10	-.1118416	.0759134	-1.47	0.141	-.2607037	.0370204
_Iind_11	.1811869	.0499317	3.63	0.000	.0832736	.2791002
_Iind_12	.1410836	.0523614	2.69	0.007	.0384058	.2437614
_Iind_13	.120025	.0579338	2.07	0.038	.00642	.23363
_Iind_14	-.0024743	.0647281	-0.04	0.970	-.1294027	.124454
_Iind_15	.1235323	.0576428	2.14	0.032	.0104978	.2365667
_Iind_16	-.0243422	.0671696	-0.36	0.717	-.1560582	.1073738
_Iind_17	-.1309298	.0570507	-2.29	0.022	-.2428032	-.0190564
_Iind_18	.1181737	.0587203	2.01	0.044	.0030264	.233321
_Iind_19	.01313	.0546206	0.24	0.810	-.093978	.120238
_Iind_20	.1459749	.0629499	2.32	0.020	.0225335	.2694163
_Iind_21	.1760551	.0594794	2.96	0.003	.0594192	.292691
_Iind_22	.1843132	.056125	3.28	0.001	.0742551	.2943713
_Iind_23	.0798951	.0584549	1.37	0.172	-.0347318	.1945221
_Iind_24	.2772029	.0693409	4.00	0.000	.1412292	.4131766
_Iind_25	.1853854	.0513004	3.61	0.000	.0847882	.2859827
_Iind_27	-.0291451	.0565037	-0.52	0.606	-.1399458	.0816556
_Iind_28	.0402388	.0653832	0.62	0.538	-.0879741	.1684516
_cons	-.4034314	.0488032	-8.27	0.000	-.4991318	-.307731

```
Linear regression                          Number of obs    =     14,842
                                           F(42, 2417)      =      61.62
                                           Prob > F         =     0.0000
                                           R-squared        =     0.1564
                                           Root MSE         =     .84633
```

F_NCSKEW	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
SY_ratio	.961559	.3410368	2.82	0.005	.2928042	1.630314
Size	.0346366	.0079282	4.37	0.000	.0190898	.0501834
Lev	-.0311753	.0382927	-0.81	0.416	-.1062653	.0439147
ROA	.1890389	.1341275	1.41	0.159	-.073978	.4520558
tobinq1	.0363848	.0047731	7.62	0.000	.027025	.0457446
W_mean	14.56912	1.342877	10.85	0.000	11.93581	17.20243
W_sd	2.057426	.5505827	3.74	0.000	.9777626	3.137088
NCSKEW	.0793826	.0101367	7.83	0.000	.059505	.0992602
d_turn	-.0250827	.025833	-0.97	0.332	-.0757398	.0255743
_Iyear_2008	-.2626796	.040797	-6.44	0.000	-.3426804	-.1826788
_Iyear_2009	.0916645	.0323629	2.83	0.005	.0282027	.1551264
_Iyear_2010	.045654	.0383172	1.19	0.234	-.0294839	.1207919
_Iyear_2011	.0590129	.0391669	1.51	0.132	-.0177912	.135817
_Iyear_2012	-.2764806	.034624	-7.99	0.000	-.3443763	-.2085849
_Iyear_2013	.7623629	.0377849	20.18	0.000	.6882687	.8364571
_Iyear_2014	-.0146879	.0304697	-0.48	0.630	-.0744374	.0450616
_Iyear_2015	-.2354959	.0322867	-7.29	0.000	-.2988084	-.1721834
_Iind_2	-.001699	.0638138	-0.03	0.979	-.1268344	.1234365
_Iind_3	.1068638	.0559058	1.91	0.056	-.0027645	.2164921
_Iind_4	.087084	.0527487	1.65	0.099	-.0163532	.1905213
_Iind_5	-.0186036	.052099	-0.36	0.721	-.120767	.0835597
_Iind_6	.1481031	.0617184	2.40	0.016	.0270766	.2691295
_Iind_8	.0146411	.0692633	0.21	0.833	-.1211804	.1504626
_Iind_9	.0805847	.0515043	1.56	0.118	-.0204125	.1815818
_Iind_10	-.1451422	.0755648	-1.92	0.055	-.2933207	.0030363
_Iind_11	.1778439	.0491354	3.62	0.000	.0814921	.2741957
_Iind_12	.1335576	.0512652	2.61	0.009	.0330293	.2340859
_Iind_13	.0154066	.0562697	0.27	0.784	-.0949352	.1257483
_Iind_14	-.0170997	.0623772	-0.27	0.784	-.1394181	.1052186
_Iind_15	.1223636	.0555021	2.20	0.028	.0135269	.2312003
_Iind_16	-.0126673	.0649812	-0.19	0.845	-.1400918	.1147573
_Iind_17	-.1042996	.0548984	-1.90	0.058	-.2119525	.0033533
_Iind_18	.1094808	.0572829	1.91	0.056	-.002848	.2218095
_Iind_19	.0107754	.0529799	0.20	0.839	-.0931153	.1146662
_Iind_20	.140338	.0604176	2.32	0.020	.0218623	.2588137
_Iind_21	.1866212	.0584332	3.19	0.001	.0720368	.3012056
_Iind_22	.1418019	.0547729	2.59	0.010	.0343952	.2492085
_Iind_23	.04291	.0563146	0.76	0.446	-.0675198	.1533399
_Iind_24	.2534534	.0687134	3.69	0.000	.1187102	.3881966
_Iind_25	.1197425	.0502843	2.38	0.017	.0211378	.2183473
_Iind_27	-.0398634	.0547772	-0.73	0.467	-.1472786	.0675517
_Iind_28	.0275659	.0631869	0.44	0.663	-.0963402	.151472
_cons	-1.33674	.1940589	-6.89	0.000	-1.717279	-.9562013

Linear regression

```
Number of obs   =     14,842
F(43, 2417)     =      60.19
Prob > F        =     0.0000
R-squared       =     0.1564
Root MSE        =     .84635
```

(Std. Err. adjusted for 2,418 clusters in stkcd)

F_NCSKEW	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
SY_ratio	.9630946	.3412409	2.82	0.005	.2939395	1.63225
Size	.0346041	.0079343	4.36	0.000	.0190453	.0501629
Lev	-.0301303	.0386814	-0.78	0.436	-.1059824	.0457217
ROA	.1899201	.1345477	1.41	0.158	-.0739207	.4537609
tobinq1	.0364692	.0047923	7.61	0.000	.0270718	.0458665
W_mean	14.57004	1.342911	10.85	0.000	11.93667	17.20342
W_sd	2.063966	.5523128	3.74	0.000	.9809109	3.147022
NCSKEW	.0794343	.0101354	7.84	0.000	.0595594	.0993093
d_turn	-.0251189	.0258362	-0.97	0.331	-.0757823	.0255444
abs_DA	-.0214394	.0827481	-0.26	0.796	-.1837039	.1408251
_Iyear_2008	-.2624645	.0408039	-6.43	0.000	-.3424787	-.1824502
_Iyear_2009	.0919833	.0324389	2.84	0.005	.0283723	.1555943
_Iyear_2010	.0458576	.0383333	1.20	0.232	-.0293118	.1210271
_Iyear_2011	.059191	.0391935	1.51	0.131	-.0176653	.1360472
_Iyear_2012	-.2763596	.0346475	-7.98	0.000	-.3443014	-.2084179
_Iyear_2013	.7625921	.0378169	20.17	0.000	.6884352	.8367491
_Iyear_2014	-.014517	.0304986	-0.48	0.634	-.0743231	.0452891
_Iyear_2015	-.2356068	.0322841	-7.30	0.000	-.2989141	-.1722995
_Iind_2	-.0012109	.0637379	-0.02	0.985	-.1261976	.1237757
_Iind_3	.1066833	.0559443	1.91	0.057	-.0030205	.2163871
_Iind_4	.086978	.0527658	1.65	0.099	-.0164928	.1904488
_Iind_5	-.0173468	.0523041	-0.33	0.740	-.1199124	.0852187
_Iind_6	.1481467	.0617118	2.40	0.016	.0271332	.2691603
_Iind_8	.0141492	.0692979	0.20	0.838	-.1217402	.1500387
_Iind_9	.0806947	.0514945	1.57	0.117	-.0202832	.1816726
_Iind_10	-.1454043	.0756003	-1.92	0.055	-.2936524	.0028439
_Iind_11	.1778128	.0491412	3.62	0.000	.0814497	.274176
_Iind_12	.1332395	.0513153	2.60	0.009	.0326131	.233866
_Iind_13	.0151906	.056312	0.27	0.787	-.0952342	.1256155
_Iind_14	-.0173768	.0624218	-0.28	0.781	-.1397825	.1050289
_Iind_15	.122996	.05549	2.22	0.027	.0141832	.2318088
_Iind_16	-.0126128	.064981	-0.19	0.846	-.1400371	.1148115
_Iind_17	-.1044317	.0549158	-1.90	0.057	-.2121186	.0032552
_Iind_18	.1097445	.0572533	1.92	0.055	-.002526	.2220151
_Iind_19	.0107629	.0529846	0.20	0.839	-.093137	.1146627
_Iind_20	.1400533	.0604689	2.32	0.021	.0214771	.2586294
_Iind_21	.1869798	.0583807	3.20	0.001	.0724985	.3014612
_Iind_22	.1420045	.0547586	2.59	0.010	.0346259	.249383
_Iind_23	.0430053	.0562948	0.76	0.445	-.0673858	.1533964
_Iind_24	.2530252	.068786	3.68	0.000	.1181396	.3879108
_Iind_25	.1195404	.0503259	2.38	0.018	.0208541	.2182267
_Iind_27	-.0396426	.0547433	-0.72	0.469	-.1469913	.067706
_Iind_28	.0284716	.0631764	0.45	0.652	-.0954139	.152357
_cons	-1.335608	.1942222	-6.88	0.000	-1.716467	-.9547486

```
Linear regression                                    Number of obs    =     14,842
                                                     F(34, 2417)      =      68.35
                                                     Prob > F         =     0.0000
                                                     R-squared        =     0.1604
                                                     Root MSE         =      .6787

                                       (Std. Err. adjusted for 2,418 clusters in stkcd)
```

F_DUVOL	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
SY_ratio	1.205707	.2732641	4.41	0.000	.669851	1.741563
_Iyear_2008	-.0756693	.0259289	-2.92	0.004	-.1265145	-.0248242
_Iyear_2009	-.077862	.0225	-3.46	0.001	-.1219833	-.0337408
_Iyear_2010	.1921645	.0242843	7.91	0.000	.1445443	.2397848
_Iyear_2011	.1018491	.0240668	4.23	0.000	.0546554	.1490428
_Iyear_2012	-.2464984	.0219638	-11.22	0.000	-.2895683	-.2034285
_Iyear_2013	.7237394	.0241377	29.98	0.000	.6764067	.7710721
_Iyear_2014	-.0544203	.0216822	-2.51	0.012	-.096938	-.0119026
_Iyear_2015	.0899948	.0237078	3.80	0.000	.0435051	.1364845
_Iind_2	-.0182042	.0474488	-0.38	0.701	-.1112487	.0748404
_Iind_3	.0561534	.0426241	1.32	0.188	-.0274301	.139737
_Iind_4	.0550842	.0406798	1.35	0.176	-.0246868	.1348551
_Iind_5	-.0578788	.0405095	-1.43	0.153	-.1373156	.0215581
_Iind_6	.0600275	.0494047	1.22	0.224	-.0368524	.1569074
_Iind_8	-.0032199	.05818	-0.06	0.956	-.1173077	.1108678
_Iind_9	-.0000483	.0397775	-0.00	0.999	-.0780498	.0779531
_Iind_10	-.1412137	.0538706	-2.62	0.009	-.2468511	-.0355763
_Iind_11	.09554	.0377894	2.53	0.012	.021437	.1696431
_Iind_12	.0734232	.0395837	1.85	0.064	-.0041984	.1510448
_Iind_13	.0557929	.0435521	1.28	0.200	-.0296103	.1411962
_Iind_14	-.0768924	.0494741	-1.55	0.120	-.1739085	.0201237
_Iind_15	.0392957	.0435978	0.90	0.368	-.0461973	.1247887
_Iind_16	-.0790731	.0509191	-1.55	0.121	-.1789226	.0207765
_Iind_17	-.1008272	.0435078	-2.32	0.021	-.1861435	-.0155108
_Iind_18	.0331013	.0441948	0.75	0.454	-.0535623	.1197648
_Iind_19	-.0359077	.0407448	-0.88	0.378	-.1158061	.0439906
_Iind_20	.0659302	.045262	1.46	0.145	-.0228262	.1546866
_Iind_21	.0703766	.0439381	1.60	0.109	-.0157836	.1565369
_Iind_22	.0324799	.0447358	0.73	0.468	-.0552446	.1202044
_Iind_23	.0292549	.0445271	0.66	0.511	-.0580604	.1165702
_Iind_24	.1188192	.049841	2.38	0.017	.0210838	.2165546
_Iind_25	.0725674	.0389482	1.86	0.063	-.0038079	.1489427
_Iind_27	-.0501011	.0425266	-1.18	0.239	-.1334935	.0332913
_Iind_28	-.029536	.0483933	-0.61	0.542	-.1244327	.0653608
_cons	-.3608618	.037468	-9.63	0.000	-.4343347	-.287389

```
Linear regression                                    Number of obs    =      14,842
                                                     F(42, 2417)      =       72.86
                                                     Prob > F         =      0.0000
                                                     R-squared        =      0.1827
                                                     Root MSE         =      .66981

                            (Std. Err. adjusted for 2,418 clusters in stkcd)
```

F_DUVOL	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
SY_ratio	.5474037	.2705919	2.02	0.043	.0167877	1.07802
Size	.0438291	.0061585	7.12	0.000	.0317526	.0559055
Lev	-.075218	.0297418	-2.53	0.012	-.1335401	-.0168959
ROA	-.0733492	.1056565	-0.69	0.488	-.2805358	.1338374
tobinq1	.0323302	.0037793	8.55	0.000	.0249193	.0397411
W_mean	12.89673	1.091174	11.82	0.000	10.75699	15.03646
W_sd	1.783949	.4365296	4.09	0.000	.9279384	2.63996
NCSKEW	.0618913	.008147	7.60	0.000	.0459155	.0778671
d_turn	-.0001123	.0204833	-0.01	0.996	-.040279	.0400544
_Iyear_2008	-.1156365	.0342182	-3.38	0.001	-.1827364	-.0485365
_Iyear_2009	-.0398698	.0257116	-1.55	0.121	-.0902888	.0105492
_Iyear_2010	.1355304	.03115	4.35	0.000	.0744468	.1966139
_Iyear_2011	.1765939	.0313043	5.64	0.000	.1152078	.2379799
_Iyear_2012	-.1729115	.0280489	-6.16	0.000	-.2279138	-.1179092
_Iyear_2013	.7127108	.030205	23.60	0.000	.6534805	.7719412
_Iyear_2014	-.04015	.0244881	-1.64	0.101	-.0881699	.0078699
_Iyear_2015	-.090227	.0262959	-3.43	0.001	-.1417919	-.0386622
_Iind_2	-.056195	.0483832	-1.16	0.246	-.1510719	.0386819
_Iind_3	.0491031	.0429792	1.14	0.253	-.0351768	.1333829
_Iind_4	.0292579	.0401736	0.73	0.467	-.0495204	.1080361
_Iind_5	-.0398773	.0402425	-0.99	0.322	-.1187906	.039036
_Iind_6	.0669013	.0483373	1.38	0.166	-.0278856	.1616882
_Iind_8	.0152297	.0576568	0.26	0.792	-.0978322	.1282915
_Iind_9	.0233124	.039195	0.59	0.552	-.0535468	.1001716
_Iind_10	-.1647616	.0552373	-2.98	0.003	-.2730789	-.0564443
_Iind_11	.1059529	.0377767	2.80	0.005	.0318748	.180031
_Iind_12	.0804125	.0396086	2.03	0.042	.0027422	.1580828
_Iind_13	-.0176072	.0431812	-0.41	0.683	-.1022833	.0670688
_Iind_14	-.0761254	.0488712	-1.56	0.119	-.1719592	.0197085
_Iind_15	.052194	.0431868	1.21	0.227	-.0324929	.1368809
_Iind_16	-.0601127	.0510653	-1.18	0.239	-.1602491	.0400236
_Iind_17	-.0776972	.0428011	-1.82	0.070	-.1616277	.0062334
_Iind_18	.0407561	.0438727	0.93	0.353	-.045276	.1267882
_Iind_19	-.0253135	.0404574	-0.63	0.532	-.1046482	.0540213
_Iind_20	.0750414	.0448173	1.67	0.094	-.0128429	.1629257
_Iind_21	.0943787	.0441931	2.14	0.033	.0077184	.1810389
_Iind_22	.0116754	.0441671	0.26	0.792	-.074934	.0982847
_Iind_23	.0102924	.0443063	0.23	0.816	-.0765899	.0971747
_Iind_24	.11895	.0497405	2.39	0.017	.0214115	.2164885
_Iind_25	.0355191	.0388237	0.91	0.360	-.0406121	.1116503
_Iind_27	-.0527679	.042281	-1.25	0.212	-.1356786	.0301428
_Iind_28	-.0246497	.0479979	-0.51	0.608	-.118771	.0694717
_cons	-1.454369	.1513381	-9.61	0.000	-1.751135	-1.157604

Linear regression		
Number of obs	=	14,842
F(43, 2417)	=	71.21
Prob > F	=	0.0000
R-squared	=	0.1827
Root MSE	=	.66983

F_DUVOL	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
SY_ratio	.5501618	.2707598	2.03	0.042	.0192163	1.081107
Size	.0437706	.0061638	7.10	0.000	.0316837	.0558575
Lev	-.0733412	.0300588	-2.44	0.015	-.1322848	-.0143976
ROA	-.0717665	.10596	-0.68	0.498	-.2795482	.1360153
tobinq1	.0324817	.003796	8.56	0.000	.025038	.0399255
W_mean	12.89839	1.091348	11.82	0.000	10.75831	15.03846
W_sd	1.795697	.4374766	4.10	0.000	.9378294	2.653565
NCSKEW	.0619843	.0081454	7.61	0.000	.0460115	.0779571
d_turn	-.0001773	.0204817	-0.01	0.993	-.0403408	.0399863
abs_DA	-.0385065	.0645026	-0.60	0.551	-.1649926	.0879795
_Iyear_2008	-.1152501	.0342199	-3.37	0.001	-.1823536	-.0481466
_Iyear_2009	-.0392972	.0257412	-1.53	0.127	-.0897743	.0111798
_Iyear_2010	.1358961	.0311589	4.36	0.000	.0747953	.196997
_Iyear_2011	.1769137	.031308	5.65	0.000	.1155203	.2383071
_Iyear_2012	-.1726942	.0280591	-6.15	0.000	-.2277166	-.1176718
_Iyear_2013	.7131226	.030215	23.60	0.000	.6538725	.7723726
_Iyear_2014	-.0398431	.0245095	-1.63	0.104	-.087905	.0082188
_Iyear_2015	-.0904263	.026302	-3.44	0.001	-.1420031	-.0388494
_Iind_2	-.0553185	.0482968	-1.15	0.252	-.150026	.039389
_Iind_3	.048779	.0430091	1.13	0.257	-.0355595	.1331174
_Iind_4	.0290674	.0401867	0.72	0.470	-.0497364	.1078713
_Iind_5	-.03762	.0403892	-0.93	0.352	-.116821	.041581
_Iind_6	.0669797	.048332	1.39	0.166	-.0277968	.1617562
_Iind_8	.0143463	.0576852	0.25	0.804	-.0987713	.127464
_Iind_9	.0235101	.0391744	0.60	0.548	-.0533087	.1003289
_Iind_10	-.1652322	.0552897	-2.99	0.003	-.2736523	-.0568122
_Iind_11	.1058971	.037782	2.80	0.005	.0318087	.1799855
_Iind_12	.0798412	.0396509	2.01	0.044	.002088	.1575944
_Iind_13	-.017995	.0432054	-0.42	0.677	-.1027185	.0667285
_Iind_14	-.076623	.0489128	-1.57	0.117	-.1725383	.0192923
_Iind_15	.0533298	.0431429	1.24	0.217	-.0312711	.1379307
_Iind_16	-.0600149	.0510742	-1.18	0.240	-.1601686	.0401389
_Iind_17	-.0779344	.0428165	-1.82	0.069	-.1618952	.0060264
_Iind_18	.0412298	.0438423	0.94	0.347	-.0447426	.1272023
_Iind_19	-.0253361	.0404621	-0.63	0.531	-.10468	.0540079
_Iind_20	.07453	.0448495	1.66	0.097	-.0134175	.1624775
_Iind_21	.0950227	.0441236	2.15	0.031	.0084986	.1815468
_Iind_22	.0120392	.0441624	0.27	0.785	-.0745609	.0986394
_Iind_23	.0104635	.0442853	0.24	0.813	-.0763776	.0973045
_Iind_24	.1181809	.0497879	2.37	0.018	.0205495	.2158123
_Iind_25	.0351561	.0388546	0.90	0.366	-.0410356	.1113479
_Iind_27	-.0523713	.0422248	-1.24	0.215	-.1351719	.0304293
_Iind_28	-.023023	.0479494	-0.48	0.631	-.1170492	.0710032
_cons	-1.452336	.151517	-9.59	0.000	-1.749452	-1.155219

Table 1

> ─────
```

| | (1) | (2) | (3) | (4) | (5) | (6 |
|---|---|---|---|---|---|---|
| | NCSKEW | NCSKEW | NCSKEW | DUVOL | DUVOL | DUVO |

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> L
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	(1)	(2)	(3)	(4)	(5)	(6
SY_ratio	1.7319***	0.9616***	0.9631***	1.2057***	0.5474**	0.550
> 2**	(4.9815)	(2.8195)	(2.8223)	(4.4122)	(2.0230)	(2.0319
Size		0.0346***	0.0346***		0.0438***	0.043
> 8***		(4.3688)	(4.3613)		(7.1169)	(7.1012
Lev		-0.0312	-0.0301		-0.0752**	-0.073
> 3**		(-0.8141)	(-0.7789)		(-2.5290)	(-2.4399
ROA		0.1890	0.1899		-0.0733	-0.071
> 8		(1.4094)	(1.4115)		(-0.6942)	(-0.6773
tobinq1		0.0364***	0.0365***		0.0323***	0.032
> 5***		(7.6229)	(7.6100)		(8.5547)	(8.5568
W_mean		14.5691***	14.5700***		12.8967***	12.898
> 4***		(10.8492)	(10.8496)		(11.8191)	(11.8188
W_sd		2.0574***	2.0640***		1.7839***	1.795
> 7***		(3.7368)	(3.7370)		(4.0867)	(4.1047
NCSKEW		0.0794***	0.0794***		0.0619***	0.062
> 0***		(7.8312)	(7.8373)		(7.5968)	(7.6097
d_turn		-0.0251	-0.0251		-0.0001	-0.000
> 2		(-0.9710)	(-0.9722)		(-0.0055)	(-0.0087
abs_DA			-0.0214			-0.038
> 5			(-0.2591)			(-0.5970
_cons	-0.4034***	-1.3367***	-1.3356***	-0.3609***	-1.4544***	-1.452
> 3***	(-8.2665)	(-6.8883)	(-6.8767)	(-9.6312)	(-9.6101)	(-9.5853

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	(1)	(2)	(3)	(4)	(5)	(6
Year_FE	Yes	Yes	Yes	Yes	Yes	Ye
> s						
Ind_FE	Yes	Yes	Yes	Yes	Yes	Ye
> s						
Cluster	Yes	Yes	Yes	Yes	Yes	Ye
> s						
N	14842	14842	14842	14842	14842	1484
> 2						
r2_a	0.135	0.154	0.154	0.158	0.180	0.18
> 0						

Table 2 verifies whether there is a non-linear relationship between goodwill and the risk of stock price collapse. It can be seen that the regression coefficient of Q4 and goodwill is significantly positive, and its absolute value is also close to the regression coefficient of goodwill in Table 1, while the regression coefficient of Q1-Q3 and goodwill is not significant. . This shows that there is a non-linear relationship between goodwill and stock price collapse risk, that is, only when goodwill is higher than a certain threshold, the positive correlation between goodwill and stock price collapse risk is established. This article believes that the reason for this result is that the higher the goodwill, the greater the improvement of the company's fundamentals. When the improvement of the company's fundamentals is higher than a certain threshold, the overreaction of investors may be stronger, which in turn triggers stock price fluctuations. Bubbles and crashes. The results in Table 3 below can provide further support for this view.

	(1) NCSKEW	(2) NCSKEW	(3) NCSKEW	(4) DUVOL	(5) DUVOL	(6) DUVOL
Q1_SY	-79.3653	-93.9862	-94.0713	-77.0595	-96.4703*	-96.6241*
	(-1.0988)	(-1.2941)	(-1.2949)	(-1.3738)	(-1.6912)	(-1.6929)
Q2_SY	-6.3131	-8.3853	-8.3433	-4.7059	-7.8037	-7.7278
	(-0.5599)	(-0.7399)	(-0.7368)	(-0.5164)	(-0.8509)	(-0.8438)
Q3_SY	0.5375	-0.3500	-0.3497	1.2176	0.3009	0.3015
	(0.2198)	(-0.1468)	(-0.1467)	(0.6738)	(0.1683)	(0.1687)
Q4_SY	1.7232***	0.9441***	0.9457***	1.1866***	0.5202*	0.5230*
	(4.9288)	(2.7569)	(2.7600)	(4.3151)	(1.9128)	(1.9221)
Size		0.0363***	0.0363***		0.0453***	0.0453***
		(4.5571)	(4.5497)		(7.3264)	(7.3111)
Lev		-0.0272	-0.0262		-0.0717**	-0.0699**
		(-0.7110)	(-0.6770)		(-2.4093)	(-2.3208)
ROA		0.1965	0.1973		-0.0674	-0.0658
		(1.4622)	(1.4641)		(-0.6366)	(-0.6199)
tobinq1		0.0366***	0.0367***		0.0325***	0.0327***
		(7.6963)	(7.6821)		(8.6375)	(8.6377)
W_mean		14.5598***	14.5607***		12.8989***	12.9006***
		(10.8493)	(10.8497)		(11.8282)	(11.8278)
W_sd		2.0723***	2.0787***		1.7937***	1.8053***
		(3.7602)	(3.7602)		(4.1076)	(4.1253)
NCSKEW		0.0795***	0.0796***		0.0620***	0.0621***
		(7.8452)	(7.8511)		(7.6135)	(7.6260)
d_turn		-0.0249	-0.0250		0.0000	-0.0000
		(-0.9649)	(-0.9662)		(0.0010)	(-0.0023)
abs_DA			-0.0212			-0.0383
			(-0.2564)			(-0.5945)
_cons	-0.4005***	-1.3756***	-1.3745***	-0.3585***	-1.4877***	-1.4856***
	(-8.2001)	(-7.0404)	(-7.0295)	(-9.5519)	(-9.7814)	(-9.7580)
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes
Ind_FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Yes	Yes	Yes	Yes	Yes	Yes
N	14842	14842	14842	14842	14842	14842
r2_a	0.135	0.154	0.154	0.158	0.180	0.180

3. Goodwill exacerbates the internal mechanism of stock price collapse risk

Zheng Haiying et al. (2014) found that goodwill improves company performance in the short term. Lin Le and Zheng Dengjin (2016) found that delisting supervision, an external governance mechanism, would reduce the risk of stock price collapse through the channel to improve company performance. If other conditions remain the same, if the goodwill of the merger and acquisition improves the company's performance, then the company's stock price collapse risk should decrease. However, the root cause of the crash is the

overvaluation of the stock price. If the company's performance improves after the merger but the risk of the crash does not decrease, it means that investors have overreacted to the merger and the stock price has a bubble, that is, the increase in stock price is significantly greater than the increase in performance. In order to verify the above conjecture, drawing on Shao Shuai and Lu Changjiang (2015) and Anderson and Reeb (2003), this article uses the following model to verify whether goodwill improves company performance and whether investors overreact.

$$ROA_{i,t}/ROA_{i,t+1} = \beta_0 + \beta_1 SY_{i,t} + \beta_2 Controls_{i,t} + \varepsilon_{i,t} \qquad (5)$$

$$CAR_{i,t}/CAR_{i,t+1} = \beta_0 + \beta_1 SY_{i,t} + \beta_2 Controls_{i,t} + \varepsilon_{i,t} \qquad (6)$$

Among them, ROA and CAR respectively refer to the company's return on total assets and the annual excess return of stock prices relative to the index; the main explanatory variable is goodwill (SY); the control variables include company size (Size), asset-liability ratio (Lev), the main business growth rate (Growth), capital expenditure (CPTEP), the company's previous year's stock price volatility (VOL), the top three executive compensation (Pay), whether the chairman and general manager are in one position (Dual), the number of independent directors (In Num) and the ratio of independent directors (In Ratio).

If M&A goodwill improves the company's fundamentals and investors overreact to mergers and acquisitions, this article predicts that while goodwill can improve the company's performance and stock price performance at the same time, it will have a stronger effect on stock price performance in the current period and show a more obvious reaction. Turn characteristics. The regression results are shown in Table 3. From the regression coefficients in columns (1) and (3), it can be seen that goodwill has a significantly stronger effect on the performance of the current stock price; at the same time, columns (1) and (3) 2) The regression coefficients in the column show that goodwill is significantly positively correlated with the return on total assets of the current period and the next period, but the regression coefficients in columns (3) and (4) indicate that goodwill is only related to the excess return on stock prices in the current period. It is positively correlated, but not correlated with the excess return on stock prices in the next period. The results in Table 3 show that goodwill improves company performance (ROA) in the short term, which is consistent with the findings of Zheng Haiying et al. (2014). Compared with the short-term promotion effect of goodwill on the company's performance, the effect of goodwill on the performance of stock prices is shorter and larger, which has caused a certain degree of bubble accumulation in stock prices. The results in Table 3 show that the goodwill of mergers and acquisitions has improved the company's performance, but investors overreacted to the good news of mergers and acquisitions, which caused a bubble in the stock price and aggravated the risk of a subsequent stock price collapse.

Table.3

	(1) ROA	(2) FROA	(3) CAR	(4) FCAR
SY_ratio	0.1557***	0.1170***	2.2424***	-0.1678
	(5.7157)	(4.0515)	(6.8323)	(-0.9316)
Size	0.0079***	0.0031***	-0.0642***	-0.0759***
	(8.4134)	(3.3731)	(-13.5175)	(-18.4786)
Lev	-0.1067***	-0.0773***	0.1278***	0.0875***
	(-26.4668)	(-20.0926)	(5.6330)	(4.4391)
re_growth	0.0000	-0.0000	0.0001***	0.0000***
	(0.6258)	(-1.1035)	(6.1945)	(5.5117)
CPTEP	-0.0200***	-0.0196***	-0.0570**	-0.0029
	(-6.2183)	(-6.1205)	(-2.4490)	(-0.1331)
VOL	0.0042	-0.0324**	-0.2909**	-0.1591*
	(0.3425)	(-2.4734)	(-2.4160)	(-1.6606)
lnPay	0.0165***	0.0152***	0.0073	0.0014
	(9.9103)	(9.1568)	(1.0734)	(0.2818)
Dual	-0.0027*	-0.0021	-0.0329***	-0.0266***
	(-1.7049)	(-1.2926)	(-2.8774)	(-2.9272)
dudong_num	-0.0027**	-0.0015	-0.0100	0.0064
	(-2.2968)	(-1.2559)	(-1.3206)	(1.1632)
dd_bili	-0.0174	-0.0241*	0.1015	0.0867
	(-1.3714)	(-1.9310)	(1.1893)	(1.2848)
_cons	-0.2747***	-0.1899***	2.3434***	1.6131***
	(-12.8574)	(-9.1964)	(20.4471)	(18.4091)
Year_FE	Yes	Yes	Yes	Yes
Ind_FE	Yes	Yes	Yes	Yes
Cluster	Yes	Yes	Yes	Yes
N	14562	14562	14561	14551
r2_a	0.244	0.172	0.285	0.273

The results of Table 1-Table 3 indicate that there may be a certain degree of bubble in the stock prices of high-goodwill companies. Table 4 uses the event study method to calculate the excess return of the stock price in different time windows before and after the merger announcement to prove that the significant increase in the stock price occurred after the merger. . The main purpose of this is to eliminate the reverse causality between mergers and acquisitions and stock price bubbles, because a large number of foreign studies have shown that the use of overvalued stocks in exchange for relatively undervalued assets is the motivation for listed companies to make acquisitions (Shleifer and Vishny, 2003; Fu et al. , 2013). Table 4 reports the market response to the private placement acquisition of assets in different time windows. CAR (-20, 0) and CAR (0, 20) respectively represent the cumulative excess return of the company's stock price relative to the index 20 trading days before the first announcement and 20 trading days after the announcement, and BHAR240 represents 240 trading days after the first announcement The company's stock price is relative to the index's purchase and holding of excess returns. It can be found that the stock price rise occurred after the merger announcement. Even one year after the announcement, the excess return on the stock price BHAR240 was still significantly positive, indicating that the merger caused the stock price to rise, and the reverse causality between mergers and acquisitions and stock price bubbles was ruled out.

4. Performance "face change" and goodwill aggravate the risk of stock price collapse: test hypothesis 2

In the case of sustainable profitability, the stock price rise does not deviate from the company's fundamentals, so it will not trigger the risk of stock price collapse. Once the company's performance declines, the previous high increase in the stock price will make investors think that the company's stock price is overvalued, and thus sell the company's stock, which intensifies the risk of stock price collapse. In order to verify the above logic, Panel A and Panel B in Table 5 are divided into sub-samples according to whether the company's return on total assets (ROA) and return on net assets (ROE) will decline in the next year. The regression results show that the relationship between goodwill aggravating the risk of stock price collapse when performance declines is more obvious, which shows that the post-merger stock price increase does not necessarily mean a bubble, only when the company's post-merger performance cannot be sustained, investors believe There is a bubble in the high stock price increase, which in turn leads to the appearance of the risk of stock price collapse.

Table.4

```
. sum car11 if year<=2013

    Variable |        Obs        Mean    Std. Dev.        Min        Max
-------------+--------------------------------------------------------
       car11 |        156    .1168214    .1766563   -.255969   1.008087

. sum car22 if year<=2013

    Variable |        Obs        Mean    Std. Dev.        Min        Max
-------------+--------------------------------------------------------
       car22 |        156    .0454598    .1896519   -.376859    .947367

. sum BHAR240 if year<=2013

    Variable |        Obs        Mean    Std. Dev.        Min        Max
-------------+--------------------------------------------------------
     BHAR240 |        156    .5211338     .956517  -1.441182   5.691445

.
. sum car11 if year==2014

    Variable |        Obs        Mean    Std. Dev.        Min        Max
-------------+--------------------------------------------------------
       car11 |        157    .1087018    .1123657   -.188319    .440508

. sum car22 if year==2014

    Variable |        Obs        Mean    Std. Dev.        Min        Max
-------------+--------------------------------------------------------
       car22 |        157    .1318466    .2601488   -.377002   1.180571

. sum BHAR240 if year==2014

    Variable |        Obs        Mean    Std. Dev.        Min        Max
-------------+--------------------------------------------------------
     BHAR240 |        157    .9481857     1.22512  -.5565012   6.070115

.
. sum car11 if year==2015 & month<=6

    Variable |        Obs        Mean    Std. Dev.        Min        Max
-------------+--------------------------------------------------------
       car11 |        133    .1723419    .1591069  -.3146264   .6781316

. sum car22 if year==2015 & month<=6

    Variable |        Obs        Mean    Std. Dev.        Min        Max
-------------+--------------------------------------------------------
       car22 |        133    .5012944    .4372922   -.499376   1.387455
```

```
. sum BHAR240 if year==2015 & month<=6

    Variable │        Obs        Mean    Std. Dev.         Min         Max
─────────────┼─────────────────────────────────────────────────────────────
     BHAR240 │        133    .4677878    .5779561   -.5104289    2.199694

.
. sum car11 if year==2015 & month>=7

    Variable │        Obs        Mean    Std. Dev.         Min         Max
─────────────┼─────────────────────────────────────────────────────────────
       car11 │         95    .0806897    .3214037   -.7464657    .7118344

. sum car22 if year==2015 & month>=7

    Variable │        Obs        Mean    Std. Dev.         Min         Max
─────────────┼─────────────────────────────────────────────────────────────
       car22 │         95    .0455551     .332298   -1.000902    .9004376

. sum BHAR240 if year==2015 & month>=7

    Variable │        Obs        Mean    Std. Dev.         Min         Max
─────────────┼─────────────────────────────────────────────────────────────
     BHAR240 │         95    .2130782    .4859906   -.5020157    1.990225
```

5. Robustness test

  (1) Replace the measurement index of the explained variable. Refer to Hutton et al. (2009), using extreme positive (negative) value returns to measure the distribution of stock price returns. When the trait return rate of a week is greater than the annual average trait return rate of 3.09 standard deviations, that is, when $W_{i,t} \geq$ Average $(W_{i,t}) + 3.09\sigma_i$, define $Jump_{i,t}$ is equal to 1, otherwise it is 0; when a week When the trait return rate of is less than 3.09 standard deviations of the annual average trait return rate, that is, when $W_{i,t} \leq$ Average $(W_{i,t}) - 3.09\sigma_i$ occurs, define $Crash_{i,t}$ equal to 1, otherwise it is 0. From the above definition, it can be seen that the two variables $Jump_{i,t}$ and $Crash_{i,t}$ are used to measure whether the weekly rate of return appears extremely positive or extremely negative. Since these two dependent variables are dummy variables, the Logit model is used in the regression. The test results show that goodwill increases the probability of a "pump" in the next year and reduces the probability of a "surge" in the next year, which shows that investors' overreaction to mergers and acquisitions "overdraft" the company's future share price growth.

  (3) Endogenous problems. In order to control the problems that the missing variables may cause to the results of this article, the two-stage least squares method (2SLS) is used here, and the average of the goodwill of all other companies in the same industry is used as an instrumental variable for regression. Fu Chao et al. (2015) found that the company's goodwill is highly correlated with the goodwill of other companies in the same industry, indicating that the instrumental variable satisfies the correlation. At the same time, there is no evidence that the average goodwill of other companies in the same industry is related to the company's stock price collapse risk in the next year, that is, this instrumental

variable conforms to exclusivity. The regression results of the first stage show that the positive relationship between goodwill and the average goodwill of other companies in the same industry is very significant, which shows that this is a relatively ideal instrumental variable in a statistical sense. The regression coefficient of the second stage is still significantly positive, indicating that the conclusion that goodwill exacerbates the risk of stock price collapse is still valid after controlling the endogenous problem.

Table5

	(1) ROA下降	(2) ROA上升	(3) ROA下降	(4) ROA上升
SY_ratio	1.4231***	0.5053	0.8989**	0.2504
	(3.0293)	(1.0165)	(2.4600)	(0.6089)
Size	0.0309***	0.0363***	0.0440***	0.0418***
	(2.7263)	(3.2024)	(4.8772)	(4.7170)
Lev	-0.0245	-0.1016*	-0.0869**	-0.1247***
	(-0.4592)	(-1.8005)	(-2.1013)	(-2.8652)
ROA	0.2647	-0.6833***	-0.1672	-0.9376***
	(1.1816)	(-3.6099)	(-0.9294)	(-6.2449)
tobinq1	0.0308***	0.0387***	0.0311***	0.0320***
	(4.2355)	(5.8919)	(5.2488)	(5.8445)
W_mean	17.0726***	13.4842***	14.6435***	12.6430***
	(8.9644)	(7.1856)	(9.7579)	(8.2243)
W_sd	0.7776	3.2033***	0.8012	2.5675***
	(0.9970)	(4.0789)	(1.2936)	(4.1125)
NCSKEW	0.0895***	0.0659***	0.0677***	0.0532***
	(6.4326)	(4.5579)	(6.1387)	(4.5607)
d_turn	-0.0012	-0.0591	0.0056	-0.0126
	(-0.0347)	(-1.6197)	(0.2040)	(-0.4427)
abs_DA	-0.1984*	0.0213	-0.1455	-0.0569
	(-1.7443)	(0.1752)	(-1.6389)	(-0.5892)
_cons	-1.0518***	-1.6619***	-1.2608***	-1.6882***
	(-3.8082)	(-5.9500)	(-5.7194)	(-7.5905)
Year_FE	Yes	Yes	Yes	Yes
Ind_FE	Yes	Yes	Yes	Yes
Cluster	Yes	Yes	Yes	Yes
N	8221	6621	8221	6621
r2_a	0.148	0.168	0.171	0.205

	(1) ROE下滑	(2) ROE未下滑	(3) ROE下滑	(4) ROE未下滑
SY_ratio	1.4334***	0.7807*	0.9842**	0.4214
	(2.6738)	(1.7680)	(2.4222)	(1.1693)
Size	0.0451***	0.0294***	0.0591***	0.0361***
	(3.5175)	(2.8887)	(5.8421)	(4.5029)
Lev	-0.0115	-0.0791	-0.0945*	-0.0920**
	(-0.1837)	(-1.6050)	(-1.9609)	(-2.3953)
ROA	0.7322***	-0.4953***	0.2753	-0.7276***
	(3.0352)	(-2.9892)	(1.4269)	(-5.4379)
tobinq1	0.0331***	0.0409***	0.0327***	0.0360***
	(4.1116)	(7.0157)	(5.0108)	(7.5243)
W_mean	16.4849***	14.6218***	14.0036***	13.8306***
	(7.8755)	(8.4300)	(8.5861)	(9.7548)
W_sd	1.1972	2.8039***	1.1071*	2.3251***
	(1.4128)	(3.7916)	(1.6518)	(3.9356)
NCSKEW	0.0930***	0.0708***	0.0660***	0.0622***
	(6.1260)	(5.2070)	(5.5444)	(5.6876)
d_turn	0.0119	-0.0659*	0.0186	-0.0275
	(0.3162)	(-1.9435)	(0.6186)	(-1.0389)
abs_DA	-0.2608**	0.0774	-0.1787*	-0.0088
	(-2.0881)	(0.7066)	(-1.8237)	(-0.1035)
_cons	-1.4437***	-1.4298***	-1.6508***	-1.5064***
	(-4.7026)	(-5.5492)	(-6.7622)	(-7.3623)
Year_FE	Yes	Yes	Yes	Yes
Ind_FE	Yes	Yes	Yes	Yes
Cluster	Yes	Yes	Yes	Yes
N	7061	7781	7061	7781
r2_a	0.153	0.167	0.176	0.200

(3) Exclude samples involving transfer of control rights. The study by Wang Huacheng et al. (2010) shows that investors will be overly optimistic about control transfer events, and M&A events may occur at the same time as control transfer events. In order to eliminate the possibility of control transfer events that may interfere with the results of this article, based on the practice of Wang Huacheng et al. (2010), this article considers the sample in which the actual controller has changed and the new majority shareholder holds more than 30% of the shares as an equity transfer sample. After excluding the equity transfer samples, the conclusion that goodwill exacerbates the risk of stock price collapse remains valid.

(4) Control governance factors. Adding other variables at the corporate governance level, including the number of boards of directors (Board Size), the proportion of independent directors (Dudongratio), and the dummy variable of whether the CEO holds concurrent positions (Dual), the previous conclusion has not changed

Fifth, further examination of the mechanism of action: bubbles vs. management "covering" negative news

This article further provides evidence in Table 6 that bubbles are the mechanism of goodwill exacerbating the risk of stock price collapse: (1) Panel A in Table 6 divides the sub-samples according to whether the turnover rate is greater than the annual median, because the higher the turnover rate The stocks means that the shorter the investor's holding period, the stronger the motivation for speculative trading, and the greater the degree of bubble in stock prices (Pan et al., 2015). (2) Panel B in Table 6 is divided into sub-samples according to whether Tobin's Q value is greater than the annual median, because companies with higher Tobin's Q value may contain a greater degree of bubbles. (3) Panel C in Table 6 divides the sample into two phases, 2007-2013 and 2014-2015. The reason for dividing the sample in this way is that goodwill was concentrated in 2014 and 2015, and 2014-2015 was the year when the overall valuation of the main board and the ChiNext market was relatively high during the sample period of this article. The regression results in Table 6 show that the relationship between goodwill and stock price collapse risk is more obvious when investors have shorter holding periods, higher company valuations, or better market conditions.

This article discusses in Table 7 the role of management's "covering" of negative news in increasing the risk of stock price collapse by goodwill. Hutton et al. (2009) pointed out that higher earnings manipulation means lower financial information transparency. Therefore, the greater the degree of earnings manipulation, the stronger the management's behavior of "covering" negative news. Kim et al. (2011b) pointed out that a high debt ratio means that the company faces greater financial risks. Therefore, when the debt ratio is high, management has a stronger motivation to hide negative news. Panel A in Table 7 divides the sample according to whether the company's accrued earnings (ABACCt) is greater than the annual median. The regression results show that when NCSKEWt+1 is used as the explained variable, the regression coefficients of goodwill are all significant, while DUVOLt+1 As the explained variable, the regression coefficients of goodwill are not significant. At the same time, the absolute values of the goodwill regression coefficients in the two sub-samples are also relatively close. Panel B divides the sample according to whether the company's debt ratio is greater than the annual median. The regression results show that goodwill aggravates the risk of stock price collapse in companies with higher leverage ratios. The results of Panel A are contrary to the predictions of Hutton et al. (2009), while the regression results of Panel B are consistent with the findings of Kim et al. (2011b), which partially proves that management's concealment of negative news also increases the risk of stock price collapse. Mechanisms.

Combining the findings in Table 6 and Table 7, this article believes that compared to management's "covering" of negative news, stock price bubbles have a stronger explanation for the increase in the risk of stock price crashes due to goodwill. Since the occurrence of any crash includes the overvaluation of stock prices and the concentrated release of negative news, this article does not deny that the accumulation and release of negative news is also an important factor in stock price crashes. The focus of this article is to show that investors will overreact to mergers and acquisitions, which leads to a stock price bubble, and a collapse occurs when the bubble cannot be sustained.

Table.6

	(1) 高换手	(2) 低换手	(3) 高换手	(4) 低换手
SY_ratio	1.0730**	0.7386	0.7185*	0.2841
	(2.2748)	(1.4810)	(1.8720)	(0.7583)
Size	0.0767***	0.0226**	0.0778***	0.0374***
	(5.3785)	(2.2779)	(6.8726)	(4.9009)
Lev	-0.0316	-0.0622	-0.0548	-0.1105***
	(-0.5266)	(-1.1899)	(-1.1620)	(-2.6797)
ROA	-0.0905	0.3003*	-0.3022*	0.0549
	(-0.4471)	(1.7093)	(-1.8969)	(0.3993)
tobinq1	0.0364***	0.0383***	0.0363***	0.0327***
	(4.9342)	(5.9902)	(5.8439)	(6.6389)
W_mean	11.3157***	16.4493***	8.4683***	15.6432***
	(5.7209)	(9.0087)	(5.2370)	(10.7932)
W_sd	-0.0002	3.7919***	-0.0398	3.1147***
	(-0.0003)	(4.7381)	(-0.0603)	(5.0273)
NCSKEW	0.0617***	0.0812***	0.0375***	0.0713***
	(4.1311)	(5.7534)	(3.1653)	(6.3339)
d_turn	-0.0443	0.0436	-0.0202	0.0415
	(-1.3427)	(0.9519)	(-0.7903)	(1.0916)
abs_DA	-0.0711	-0.0084	-0.0565	-0.0470
	(-0.5630)	(-0.0782)	(-0.5727)	(-0.5550)
_cons	-2.1470***	-1.1114***	-2.1478***	-1.3040***
	(-6.5651)	(-4.4390)	(-8.2920)	(-6.7410)
Year_FE	Yes	Yes	Yes	Yes
Ind_FE	Yes	Yes	Yes	Yes
Cluster	Yes	Yes	Yes	Yes
N	6844	7998	6844	7998
r2_a	0.162	0.158	0.212	0.166

Table8.9anel B 区分估值示 T

	(1) 高估值	(2) 低估值	(3) 高估值	(4) 低估值
SY_ratio	1.0068**	-0.0307	0.5935*	-0.2343
	(2.5111)	(-0.0458)	(1.8999)	(-0.4272)
Size	0.1192***	0.0269**	0.1138***	0.0361***
	(9.3792)	(2.3251)	(11.2715)	(4.0816)
Lev	0.0518	0.0497	-0.0016	-0.0078
	(0.9521)	(0.8248)	(-0.0363)	(-0.1659)
ROA	-0.1745	-0.1543	-0.3164**	-0.4438**
	(-1.0625)	(-0.6071)	(-2.3588)	(-2.2997)
tobinq1	0.0401***	0.1739***	0.0367***	0.1529***
	(6.9160)	(5.8543)	(7.9156)	(6.4403)
W_mean	8.4911***	16.8265***	6.4127***	15.4687***
	(4.7120)	(8.0810)	(4.4376)	(9.1276)
W_sd	0.4958	2.5090***	0.6312	1.9854***
	(0.6544)	(2.9907)	(1.0360)	(2.9953)
NCSKEW	0.0434***	0.0969***	0.0283**	0.0773***
	(3.0189)	(6.7505)	(2.4679)	(6.7194)
d_turn	-0.0531*	0.0632	-0.0160	0.0616*
	(-1.6863)	(1.4557)	(-0.6373)	(1.8432)
abs_DA	0.0651	-0.1305	0.0045	-0.1019
	(0.5691)	(-1.1105)	(0.0497)	(-1.1153)
_cons	-3.1804***	-1.3641***	-3.0179***	-1.4202***
	(-10.6120)	(-4.5603)	(-12.8262)	(-6.1350)
Year_FE	Yes	Yes	Yes	Yes
Ind_FE	Yes	Yes	Yes	Yes
Cluster	Yes	Yes	Yes	Yes
N	6945	7897	6945	7897
r2_a	0.169	0.146	0.226	0.153

2. The social welfare effect of the M&A bubble

The previous results indicate that M&A goodwill will trigger stock price bubbles and collapses. Then, will M&A-induced bubbles lead to wealth transfer between the company's internal personnel and other investors? In order to explore the possible wealth transfer effects of bubbles, Table 8 summarizes The number of shares reduced by the company's executives in the year accounted for the company's total share capital, and it was compared whether there is a difference in the percentage of executive reductions between high-goodwill companies, low-goodwill companies and non-goodwill companies. Among them, high goodwill companies refer to companies with goodwill greater than zero and located in the top 25% quantile, low goodwill refers to companies with goodwill greater than zero and ranking below the 25% quantile, and companies without goodwill Refers to companies with zero goodwill. The results of the mean test show that the reduction ratio of high-goodwill company executives is significantly higher than that of low-goodwill or non-goodwill companies, indicating that the company's internal personnel can recognize that the stock price is overvalued, so they use the stock price bubble caused by mergers and acquisitions to reduce the price. Support and realize the transfer of wealth.

Table.7

	(1) DA高	(2) DA低	(3) DA高	(4) DA低
SY_ratio	0.9653**	1.0387*	0.5482	0.6003
	(2.2461)	(1.8740)	(1.5798)	(1.3918)
Size	0.0146	0.0576***	0.0270***	0.0625***
	(1.2394)	(5.2420)	(2.9364)	(7.0152)
Lev	-0.0274	-0.0260	-0.0735*	-0.0679
	(-0.5023)	(-0.4576)	(-1.7179)	(-1.5281)
ROA	-0.0332	0.7535***	-0.2480*	0.3850**
	(-0.2046)	(3.0706)	(-1.9410)	(1.9888)
tobinq1	0.0355***	0.0376***	0.0285***	0.0369***
	(5.6984)	(4.8755)	(5.6931)	(5.9560)
W_mean	12.3337***	16.5810***	11.9018***	13.7970***
	(6.5823)	(8.6029)	(7.8772)	(8.7905)
W_sd	1.5431**	2.5893***	1.3818**	2.2246***
	(1.9643)	(3.2474)	(2.2631)	(3.4477)
NCSKEW	0.0669***	0.0914***	0.0580***	0.0660***
	(4.6516)	(6.1852)	(4.8968)	(5.7755)
d_turn	-0.0162	-0.0322	0.0194	-0.0172
	(-0.4397)	(-0.9073)	(0.6700)	(-0.6111)
abs_DA	-0.0496	-0.4992	-0.0605	-0.6180
	(-0.4582)	(-1.0499)	(-0.7203)	(-1.5550)
_cons	-0.7353***	-2.0036***	-0.9629***	-1.9855***
	(-2.6188)	(-7.4528)	(-4.3426)	(-9.1693)
Year_FE	Yes	Yes	Yes	Yes
Ind_FE	Yes	Yes	Yes	Yes
Cluster	Yes	Yes	Yes	Yes
N	7330	7512	7330	7512
r2_a	0.143	0.167	0.172	0.189

	(1) 高杠杆	(2) 低杠杆	(3) 高杠杆	(4) 低杠杆
SY_ratio	1.1773**	0.8412*	0.6798*	0.4752
	(2.4515)	(1.8616)	(1.7539)	(1.3357)
Size	0.0204*	0.0718***	0.0305***	0.0746***
	(1.9409)	(5.4649)	(3.7376)	(7.1079)
Lev	-0.0861	-0.0660	-0.1240**	-0.1295*
	(-1.0660)	(-0.7178)	(-2.0354)	(-1.7849)
ROA	-0.2124	0.4878**	-0.3471**	0.1316
	(-1.0891)	(2.5278)	(-2.2837)	(0.8610)
tobinq1	0.0449***	0.0345***	0.0366***	0.0331***
	(5.8182)	(5.3153)	(6.0858)	(6.3308)
W_mean	18.7724***	8.9114***	16.3521***	7.7636***
	(9.9919)	(4.5931)	(10.7372)	(4.9225)
W_sd	2.3594***	2.0137**	1.9170***	1.8626***
	(3.0823)	(2.4896)	(3.1534)	(2.9019)
NCSKEW	0.0905***	0.0626***	0.0711***	0.0492***
	(6.5791)	(4.1498)	(6.5038)	(4.1036)
d_turn	-0.0385	-0.0040	0.0002	0.0110
	(-0.9798)	(-0.1215)	(0.0058)	(0.4074)
abs_DA	-0.1494	0.1108	-0.1375	0.0671
	(-1.3736)	(0.8548)	(-1.6247)	(0.6507)
_cons	-0.9257***	-2.2695***	-1.0554***	-2.2501***
	(-3.5206)	(-7.2727)	(-5.1205)	(-9.0319)
Year_FE	Yes	Yes	Yes	Yes
Ind_FE	Yes	Yes	Yes	Yes
Cluster	Yes	Yes	Yes	Yes
N	7835	7007	7835	7007
r2_a	0.143	0.173	0.154	0.219

Table.8

```
. sum jianchi_total if High_SY==1        //高商营公司高管减持比例

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
 jianchi_to~l |        812    2.190378    6.228458         0    31.6256

. ttest jianchi_total==0 if High_SY==1

One-sample t test
----------------------------------------------------------------------
Variable |      Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+------------------------------------------------------------
jianch~l |      812    2.190378     .218576    6.228458    1.761337     2.61942
----------------------------------------------------------------------
    mean = mean(jianchi_total)                              t =  10.0211
Ho: mean = 0                                 degrees of freedom =      811

    Ha: mean < 0                 Ha: mean != 0                 Ha: mean > 0
 Pr(T < t) = 1.0000       Pr(|T| > |t|) = 0.0000        Pr(T > t) = 0.0000

.
. sum jianchi_total if Low_SY==1 //低商营公司高管减持比例

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
 jianchi_to~l |      2,463    .9719205    4.354446         0    31.6256

. ttest jianchi_total==0 if Low_SY==1

One-sample t test
----------------------------------------------------------------------
Variable |      Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+------------------------------------------------------------
jianch~l |    2,463    .9719205    .0877406    4.354446    .7998674    1.143974
----------------------------------------------------------------------
    mean = mean(jianchi_total)                              t =  11.0772
Ho: mean = 0                                 degrees of freedom =     2462

    Ha: mean < 0                 Ha: mean != 0                 Ha: mean > 0
 Pr(T < t) = 1.0000       Pr(|T| > |t|) = 0.0000        Pr(T > t) = 0.0000
```

```
.

. sum jianchi_total if None_SY==1    //无商营公司高管减持比例

    Variable |        Obs        Mean    Std. Dev.        Min        Max

jianchi_to~l |     11,567    .7829943    3.841079          0    31.6256

. ttest jianchi_total==0 if None_SY==1

One-sample t test

Variable |        Obs        Mean    Std. Err.    Std. Dev.    [95% Conf. Interval]

jianch~l |     11,567    .7829943    .0357144    3.841079    .7129881    .8530004

    mean = mean(jianchi_total)                             t =   21.9238
Ho: mean = 0                              degrees of freedom =      11566

    Ha: mean < 0                  Ha: mean != 0                  Ha: mean > 0
 Pr(T < t) = 1.0000       Pr(|T| > |t|) = 0.0000       Pr(T > t) = 0.0000

.

. preserve   //高商营-低商营

. keep if High_SY==1 | Low_SY==1
(11,567 observations deleted)

. ttest jianchi_total,by(High_SY)

Two-sample t test with equal variances

    Group |        Obs        Mean    Std. Err.    Std. Dev.    [95% Conf. Interval]

        0 |      2,463    .9719205    .0877406    4.354446    .7998674    1.143974
        1 |        812    2.190378     .218576    6.228458    1.761337     2.61942

 combined |      3,275    1.274024    .0858634    4.913758    1.105672    1.442375

    diff |              -1.218458    .1977291              -1.606143    -.8307726

    diff = mean(0) - mean(1)                               t =   -6.1623
Ho: diff = 0                              degrees of freedom =       3273

    Ha: diff < 0                  Ha: diff != 0                  Ha: diff > 0
 Pr(T < t) = 0.0000       Pr(|T| > |t|) = 0.0000       Pr(T > t) = 1.0000

Two-sample t test with equal variances

    Group |        Obs        Mean    Std. Err.    Std. Dev.    [95% Conf. Interval]

        0 |     11,567    .7829943    .0357144    3.841079    .7129881    .8530004
        1 |        812    2.190378     .218576    6.228458    1.761337     2.61942

 combined |     12,379    .8753116    .0364527    4.055759    .8038586    .9467645

    diff |              -1.407384    .1467018              -1.694943    -1.119826

    diff = mean(0) - mean(1)                               t =   -9.5935
Ho: diff = 0                              degrees of freedom =      12377
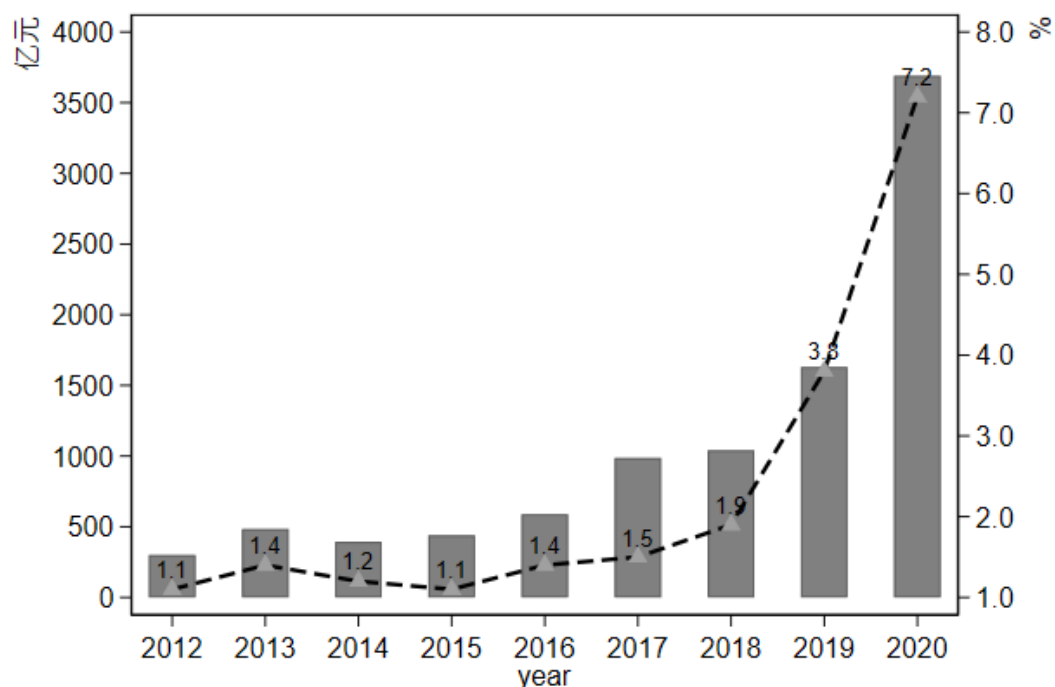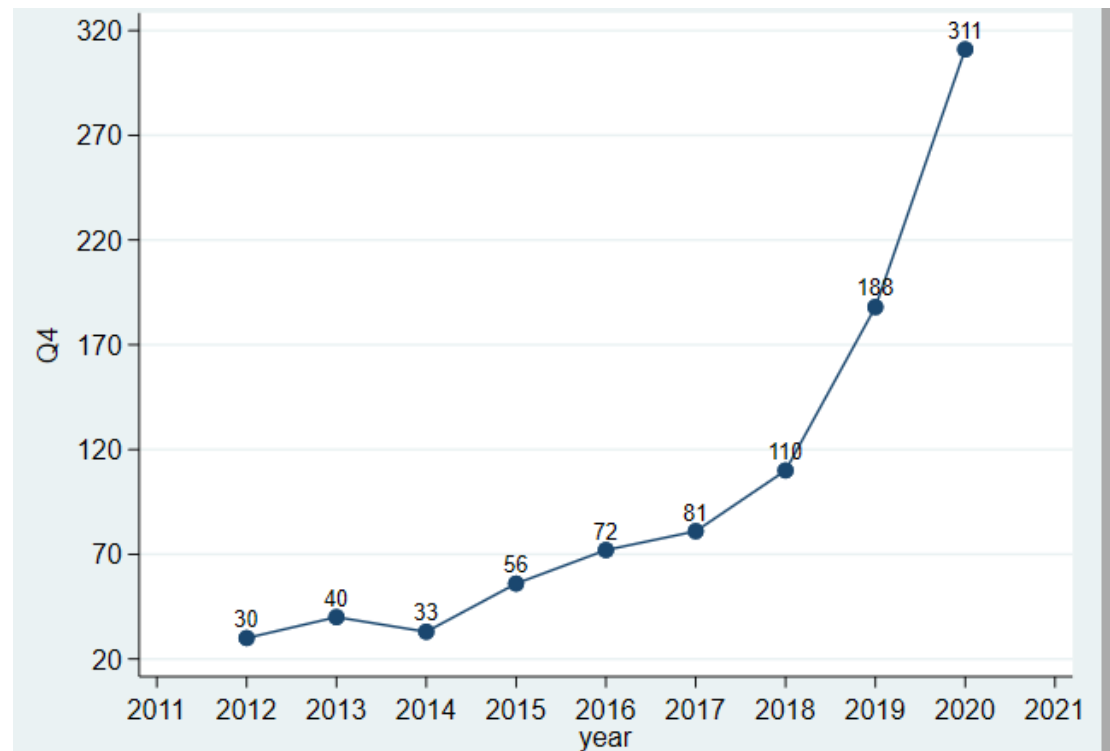
    Ha: diff < 0                  Ha: diff != 0                  Ha: diff > 0
 Pr(T < t) = 0.0000       Pr(|T| > |t|) = 0.0000       Pr(T > t) = 1.0000
```

Substantial and meaningful expansion of the paper:

1. Further examination of the mechanism of action: bubbles vs. management "covering" negative news

Add the latest data until 2020 to update the data inspection
1) A further test of the mechanism of goodwill exacerbating the stock price collapse
2) The social welfare effect of the M&A bubble

1. Annual distribution of goodwill

Figure 1

Figure 1 plots the absolute and relative values of accumulated goodwill of listed companies from 2012 to 2020. It can be seen from Figure 1 that the absolute value of goodwill
The value increased from less than 30 billion yuan in 2012 to nearly 380 billion yuan in 2020, and its proportion of the company's total assets also increased.

From 1.1% in 2007 to 7.2% in 2020. The increase in the absolute value and relative value of goodwill reflects the expansion of the scale of mergers and acquisitions big and pay premium increase.

Figure 2

Annual distribution of high-goodwill companies

From the regression results in Table 2 of the main text, it can be seen that goodwill aggravates the risk of stock price collapse mainly from samples with high goodwill. This kind of high
The annual distribution of goodwill companies is shown in Figure 2. It can be seen from Figure 2 that the number of high-goodwill companies increased relatively
Stable, increasing from 30 to 110; in 2019-2020, it increased rapidly, from 110 at the end of 2018 to 2020   at the end of the year. The substantial increase in high-goodwill companies is closely related to the rapid development of the M&A market in recent years, showing that companies
During the period when the M&A market was developing well, the M&A industry implemented larger-scale M&As with higher premiums, thus accumulating higher business reputation.
The annual distribution of high-goodwill companies is consistent with the overall distribution of goodwill. This Panel in Table 7 of the main text divides M&A into two phases, 2012-2018 and 2019-2020.

2. Research on industrial policies may cause some companies to engage in policy-based arbitrage mergers and acquisitions, only for the purpose of obtaining government support rather than actually transferring operating resources and focus

The national industrial policy is essentially a policy tool used by the government to guide the flow of social resources to supported industries through various levels of policy support for various industries to achieve the transformation and upgrading of the government-led industrial structure. The empirical results show that the main and corporate enterprises are more likely to be Target companies that are supported by industrial policies initiate cross-industry mergers and acquisitions; on this basis, if the main merged company itself is not supported by industrial policies, the above conclusions will be further strengthened; after considering the nature of corporate ownership, it is found that state-owned enterprises are more likely to initiate mergers and acquisitions with industrial policies. Cross-industry mergers and acquisitions with consistent orientation; however, if the merging companies themselves are supported by industrial policies, then state-owned companies will also conduct cross-industry mergers and acquisitions less than non-state-owned companies. Further analysis found that some companies' main income after cross-industry mergers and acquisitions accounted for The ratio did not decrease but increased instead. After the merger and acquisition, it did not transfer resources to new industries. It may only be a "policy arbitrage" behavior to arbitrage government subsidies. Compared with non-state-owned enterprises, state-owned enterprises are motivated by "policy arbitrage" The possibility of cross-industry mergers and acquisitions is lower.

6. Research conclusions and enlightenment

1. Research conclusion

With the rapid development of the M&A and restructuring market, more and more listed companies choose M&A as an extensional growth method. In response to this phenomenon, based on the empirical evidence of Chinese listed companies, this article uses goodwill as the annual proxy indicator of corporate mergers and acquisitions, studies the economic consequences of corporate mergers and acquisitions, and discusses its internal mechanism. Studies have shown that goodwill intensifies the risk of stock price collapse, and the correlation between the two is mainly due to companies with high goodwill. The explanation in this article is that investors overreacted to mergers and acquisitions, which caused the stock price to accumulate a certain degree of bubble. When the performance declines, investors realize that the stock price is overvalued. At this time, the bubble cannot continue and then collapses. In order to verify this point of view, this article finds that goodwill improves the company's

performance, but compared to the improvement extent of goodwill on the company's performance, goodwill has a stronger effect on the company's stock price performance and has a shorter period. After comparing the bubble and the management's "covering" the negative news about the two mechanisms for explaining the stock price crash, the empirical results show that the stock price bubble has a stronger explanatory power, which is manifested in the fact that the relationship between goodwill and the risk of stock price crash is longer in the investor's holding period. It is more obvious when the company's valuation is higher and the market conditions are better. In addition, this article also finds that the proportion of executives in high-goodwill companies is significantly higher than that of companies with low or no goodwill, indicating that in terms of social welfare effects, insiders have used the stock price bubble triggered by mergers and acquisitions to achieve wealth transfer and damage To protect the interests of other investors.

2. Implications and policy recommendations

(1) Improve asset pricing efficiency and curb asset price bubbles. This article finds that investors will overreact to mergers and acquisitions, which will lead to stock price bubbles and collapses, which indicates that the pricing efficiency of China's capital market still needs to be improved. However, this article also finds that whether the stock price collapses after the merger is obviously related to whether the company's performance declines. This shows that the stock price performance is closely related to the company's intrinsic fundamental value, and the market can make roughly accurate judgments about the company's value. Based on this, this article proposes: (1) Further improve various systems to improve market pricing efficiency, for example, consider further relaxing short-selling constraints and expanding the underlying stocks of margin financing and securities lending, so that negative news held by some investors can be reflected in the stock price in a timely manner This will help curb the asset price bubble; (2) The risk of aggravated goodwill stock price collapse is closely related to the overreaction of investors. Therefore, the supervisory authority needs to further strengthen investor education so that investors can establish correct value investment concepts. Avoid following the trend of market hotspots such as mergers and acquisitions, so as not to cause huge stock price fluctuations; (3) Investors' overreaction to mergers and acquisitions is more or less due to the inability to accurately identify the value creation effect of mergers and acquisitions. Therefore, listed companies need to strengthen mergers and acquisitions and restructuring. The disclosure of relevant information enables investors to rationally view the positive effects of mergers and acquisitions.

(2) Listed companies should pay attention to the active role of optimizing resource allocation by the M&A market, rather than using M&A as a capital operation method to boost stock prices. This article finds that the stock price has risen significantly after the merger, and the scale of reduction of the management of high-goodwill companies is significantly higher than that of companies with low or no goodwill. Although there is no evidence that the post-merger stock price rise was intentional by the management, it is undeniable that the management took advantage of investors' overreaction to mergers and acquisitions to achieve high shareholding reduction and wealth transfer. Based on this, this article proposes: (1) Listed companies should not blindly pay high premiums during mergers and acquisitions, and should scientifically and reasonably evaluate the promotion of mergers and acquisitions on the company's overall performance and ensure that this promotion is sustainable, otherwise once

the performance of mergers and acquisitions A decline is likely to cause the company's stock price to collapse; (2) In order to avoid some listed companies from raising their stock prices and reducing their holdings through capital operations such as mergers and acquisitions, the supervisory authority should further regulate the mergers and acquisitions of listed companies to ensure the long-term interests of managers Start and implement mergers and acquisitions that truly create value for shareholders.

(3) The supervisory authority should further improve the relevant procedures and rules of mergers and acquisitions in order to promote the healthy development of the merger and reorganization market. Listed companies use equity as a payment method to implement mergers and acquisitions, their share prices will rise significantly. Although no clear evidence is provided, this article speculates that this phenomenon may be related to the pricing rules of listed companies' mergers and acquisitions and the lock-up period of equity financing. Listed companies usually use private placement as a financing method during mergers and acquisitions. The feature of this financing method is that the pricing date precedes the implementation date of the merger and the date of lifting the ban on new shares. Once the subscription price of the fund supplier is determined, relevant stakeholders will have the incentive to stimulate the stock price to rise through various means, and some investors may also regard the additional issuance price as a "guaranteed" price and intensify risky behavior in stock trading. New shares usually have a lock-up period of 1-3 years, and the new shares will not be circulated in the market during the restricted sale period, and will not cause downward pressure on stock prices. Therefore, it is necessary to further explore and improve the pricing mechanism of mergers and acquisitions, reduce the possibility of institutional arbitrage, and make the stock price more closely reflect the company's fundamental value.

It should be noted that although this article has found that mergers and acquisitions will trigger the adverse consequences of stock price bubbles and collapses, this does not represent a complete denial of the role of the merger and acquisition market in optimizing resource allocation. With the gradual improvement of capital market-related systems and the gradual improvement of investors' awareness, it will be a very important proposition to optimize the allocation of resources through the M&A market to better serve the real economy. Different participants in the capital market, especially listed companies, should have a long-term strategic vision. They should make full use of mergers and acquisitions and reorganizations to optimize the integration of resources, so as to continuously improve company performance and create more value for investors, instead of using market forces. The hype enthusiasm uses mergers and acquisitions as a self-interested tool to increase stock prices and reduce holdings.