Is there any motivation for earnings management in goodwill impairments?——Taking listed companies in the transportation industry as an example

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Abstract. This paper takes the A-share listed companies in the transportation industry as a sample to empirically study the economic incentives of goodwill impairment of listed companies in the transportation industry. The study finds that the listed companies in the transportation industry have incentives for earnings management, which is characterized by the motivation of "big bathing" and the smoothing motive of earnings. Among them, listed companies are more inclined to use goodwill impairment for earnings smoothing.

1. Introduction

In recent years, listed companies have set off a wave of mergers and acquisitions. According to the data released by the China Securities Regulatory Commission,as of the end of the third quarter of 2018, the total goodwill of A-shares was approximately 1.45 trillion yuan. The larger the proportion of goodwill, the greater the impact of its impairment provision on corporate profits. Therefore, the specific signs of goodwill impairment have become the focus of the theoretical and practical circles. In the existing literature on goodwill impairment, most of the research is about value correlation. The research literature on the reasons for the large amount of goodwill impairment is relatively scarce, and it is more and more important to study it.

Based on the sample of A-share listed companies from 2014 to 2018, this paper empirically tests whether the impairment of goodwill accrued by listed companies in the transportation industry has incentives for earnings management. The contribution of this paper is to expand the research in the field of earnings management motivation and have certain reference significance for corporate governance, policy makers and market regulators.

2. Research Hypothesis

To a considerable extent, the downturn of the real economy has accelerated the outbreak of the risk of goodwill impairment. And its risks are slowly appearing in the transportation industry. For the incentives for the impairment of goodwill, Ji Ying (2014) believes that the impairment of goodwill of listed companies after the implementation of the new accounting standards is mainly affected by the incentives of earnings management. Among them, the downward earnings management motives are specifically expressed as the "big bathing" motive and the earnings smoothing motive. In addition, since most companies in the transportation industry have good cash flow and stable profits, they are more inclined to use the impairment of goodwill for earnings smoothing. Based on this, this paper believes that the impairment of goodwill from listed companies in the shipping industry has the incentive of earnings management, and is more inclined to the smoothing motive of earnings, and puts forward the following assumptions:

H1:Listed companies in the transportation industry have incentives for earnings management.

H2:Listed companies in the transportation industry are more inclined to the smoothing motive of earnings.

3. Research Design

3.1 Sample Selection and Data Source

This paper takes the A-share listed companies in the transportation industry from 2014-2018 as the initial sample. The transportation industry is based on the industry standard of the CSRC and is screened according to the following procedures: (1) excluding the ending balance of goodwill and goodwill impairment samples with zero at the same time, the company has no goodwill, so the impairment test of goodwill is not required; (2) eliminate all missing data samples. In the end, 387 observations were obtained, of which 159 observations confirmed the loss of goodwill impairment. The relevant research data is mainly from the iFinD database.

Table 1. Mergers and Acquisitions of Listed Companies in the Transportation Industry in 2014-2018

Year	2014	2015	2016	2017	2018	Total
Number of listed companies	69	73	78	82	84	387
Number of companies with goodwill	29	29	32	39	30	159
Number of goodwill impaired entrepreneurs	3	4	3	7	4	21
The proportion of households with impairment	10.34%	13.79%	9.38%	17.95%	13.33%	13.21%
Goodwill amount (100 million yuan)	120.42	121.16	282.56	326.56	291.75	1142.45
Goodwill impairment amount (100 million yuan)	0.02	0.35	1.17	1.07	1.18	3.79

As can be seen from Table 1, the average value of companies with impairment of goodwill in the transportation industry is about 13%, and the highest proportion in 2017, reaching 17.95%. The number of goodwill impairment companies in the 2014-2016 M&A period was relatively stable, but after the tide of mergers and acquisitions, the number of goodwill impairment companies increased sharply. As can be seen from Table 1, the impairment amount of goodwill of listed companies in the transportation industry has increased significantly since 2016. In summary, the research value of goodwill impairment is prominent.

3.2 Model Setting and Variable Definition

Model (1) and model (2) are designed by referring to the methods of Wang Xiuli (2015), Lu Hao and Qu Xiaohui (2016). In this paper, the Logit model design model (1) is used to test the influencing factors of the listed company's goodwill impairment provision policy; the Tobit regression model design model (2) is selected to test the decisive factors of the goodwill impairment provision. After controlling the relevant factors, the specific model is as follows:

$$GMI\_D = \beta_0 + \beta_1 Bath_t + \beta_2 Smooth_t + \beta_3 \Delta Sales_t + \beta_4 ROA_t + \beta_5 Size_t + \beta_6 Lev_t + \sum Year + \varepsilon \quad (1)$$

$$GMI\_E = \alpha_0 + \alpha_1 Bath_t + \alpha_2 Smooth_t + \alpha_3 \Delta Sales_t + \alpha_4 ROA_t + \alpha_5 Size_t + \alpha_6 Lev_t + \sum Year + \varepsilon \quad (2)$$

(1) Dependent variable. This article refers to Wang Xiuli (2015) and Lu Wei and Qu Xiaohui (2016), and uses the GWI_E and GWI_D to measure goodwill impairment. GWI_E refers to the proportion of goodwill impairment provision, that is, the ratio of goodwill impairment in t year to the balance of goodwill in t-1 year; GWI_D is a dummy variable, if the listed company accrues goodwill impairment loss in t year, it is 1, otherwise it is 0.

(2) Independent variables. Referring to the study by Feng Gu et al. (2011), the motivation for “big bathing” and the smoothing motive of earnings are defined. When the net profit before the impairment of goodwill (divided by the total assets at the end of the year) is negative, and the change value is lower than the median of all negative values, the company has the motivation for “big bathing”, and Bath takes the value 1; otherwise, take 0 . When the net profit before goodwill impairment (divided by the total assets at the end of the year) is positive and its change value is higher than the median of all positive values, the company has the smoothing motive of earnings, and Smooth takes a value of 1; otherwise, it takes 0.

(3) Control variables. This article will measure the impact of goodwill impairment on the net profit margin on sales(△Sales) and total net asset interest rate (ROA). In addition, combined with Zhang Xinmin (2018), this paper takes the company size(Size) and asset-liability ratio (Lev) as

other control variables.

Table 2. Variable Definition Table

Variable type	Variable name	Variable name	Variable definitions
Dependent variable	Continuous variable of goodwill impairment	GMI_E	T-year goodwill impairment loss / t-1 year goodwill
	Virtual variable of goodwill impairment	GMI_D	If the goodwill impairment occurs, take 1; otherwise, take 0
Independent variable	Big bathing	Bath	If ROA<0 and △ROA is less than the median of all negative values, take 1; otherwise, take 0
	Surplus smooth motive	Smooth	If ROA>0 and △ROA is greater than the median of all positive values, take 1; otherwise, take 0
Control variable	Net profit margin on sales	△Sales	The change in the profit margin of t year and t-1 years
	Total net asset interest rate	ROA	Net profit/total assets at year end
	Size	Size	The natural logarithm of the total assets at the end of the year
	Asset-liability ratio	Lev	Ending balance of total liabilities/ending balance of total assets

4. The Empirical Results and Analysis

4.1 Descriptive Analysis

Table 3 is a descriptive statistical result of the main variables of the full sample. The annual value of goodwill impairment loss/t-1 year goodwill (GMI_E) is 1, the minimum is 0, and the average is 0.0320. In addition, from the average of the good value of the goodwill impairment, the sample of goodwill impairment loss accounted for 11.95% of the total sample. Among the two types of earnings management motives, the number of samples for “big bathing” motivation is small, accounting for 1.89% of the total sample, while the number of the smoothing motive of earnings is relatively large, accounting for 48.43% of the total sample. The average value of the change in the net profit margin on sales (△Sales) is -40.5681, the maximum value is 4229.145, and the minimum value is -8671.763, indicating that the change in the net profit margin of listed companies in the transportation industry varies greatly. The total net asset interest rate (ROA) is 3.9071, with a maximum of 28.673 and a minimum of -13.816. The difference is also large. Among other control variables, the average size is 23.4217, while the average asset-liability ratio is as high as 48.4720.

Table 3. Descriptive statistics of the main variables - full sample

Variable name	Observations	Average value	Min	Max	25% unit	50% unit	75% unit	SD
GMI_E	158	0.0320	0	1	0	0	0	0.0145
GMI_D	159	0.1195	0	1	0	0	0	0.3254
Bath	159	0.0189	0	1	0	0	0	0.1365
Smooth	159	0.4843	0	0	0	0	1	0.5013
△Sales	159	-40.5681	-8671.763	4229.145	-30.333	-2.494	22.374	786.9603
ROA	159	3.9071	-13.816	28.673	1.998	3.184	5.437	3.9460
Size	159	23.4217	20.013	26.219	22.203	23.236	24.508	1.4901
Lev	159	48.4720	10.385	85.533	37.183	48.129	61.833	17.7133

4.2 Multiple Regression Analysis

This paper uses the Logit model and the Tobit model to analyze the motivation of goodwill impairment, that is, to verify the hypothesis H1: the company has earnings management motives, from the perspective of whether to deduct goodwill impairment and the proportion of depreciation of goodwill and H2: listed companies in the transportation industry are more inclined to the smoothing motive of earnings. The specific regression results are shown in Table 4.

Table 4. Logit and Tobit regression coefficient estimation and significance test

	Logit			Tobit		
Variable	Coef.	z	p>z	Coef.	t	p>t
_cons	11.77	2.22	0.026	1.894	1.65	0.102
Bath	0	0	0	-3.6867	-	-
Smooth	2.5355	2.85	0.004	0.8632	3.04	0.003
△Sales	-0.0002	-0.38	0.705	-0.0001	-0.73	0.467
ROA	-0.1179	-0.81	0.42	-0.0434	-1.19	0.236
Size	-0.846	-3.37	0.001	-0.1749	-3.06	0.003
Lev	0.0891	3.44	0.001	0.0219	2.98	0.003
LR chi2(5) 33.73 Pseudo R2 0.2918				Pseudo R2 0.2582		

It can be seen from Table 4 that the explanatory variables are significantly positively correlated with the bathing motive and the smoothing motive, indicating that the company is more inclined to accrue the impairment of goodwill in the years when the performance is more volatile. From Table 4, it can be seen that the bathing motive is significantly negatively correlated with the explained variable, and the surplus smoothing motive is significantly positively correlated with the explained variable, indicating that the transportation industry enterprises, when the earnings fluctuation is large, It tends to use the impairment of goodwill for earnings smoothing. In addition, goodwill impairment and net profit margin on sales and the total net asset interest rate are significantly unrelated to the explanatory variables, which may be due to the failure to confirm the goodwill impairment. Other control variables, such as size, are significantly negatively correlated with the explanatory variables. The larger the scale, the less the depreciation of the denominated goodwill; the asset-liability ratio is significantly positively correlated with the explanatory variables, consistent with expectations.

5. Conclusion and Enlightenment

This paper examines the economic incentives for goodwill impairment from listed companies in the transportation industry through empirical research. The research results show that there is a surplus management motive for goodwill impairment in listed companies in the transportation industry. The specific performance is the motive of “big bathing” and the smoothing motive of earnings. Among them, listed companies are more inclined to use goodwill impairment to smooth the earnings. The purpose of subsequent measurement of goodwill should be to reasonably reflect changes in the performance of the company, rather than using it for earnings management. The research results of this paper have certain positive significance for the work of market regulators.

The lack of research. The goodwill impairment decision is made up of a combination of various complex factors. The control variables selected in this paper are limited. Only the variable of the net profit margin on sales, the total net asset interest rate, the size and the asset-liability ratio are selected as control variables. Whether these control variables can summarize all the influencing factors of goodwill impairment needs further verification.

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