



## Empirical Analysis of Financial Performance of Listed Company in Retail Based on Factor Analysis Method

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Received 14 July 2018; accepted 17 September 2018

Published online 26 September 2018

### Abstract

This paper use factor analysis method to compare the financial performance of listed retail companies horizontally. We can get the level of the development of the company in the industry. Because the data of every year are available, every year factor analysis can be carried out and obtained a comprehensive score, which is a dynamic and changing analysis process. It provides us the direction for the improvement of enterprise's financial performance.

**Key words:** Financial performance; Factor analysis method

Ge, Y. L., & Ye, J. (2018). Empirical Analysis of Financial Performance of Listed Company in Retail Based on Factor Analysis Method. *International Business and Management*, 16(1), 65-68. Available from: <http://www.cscanada.net/index.php/ibm/article/view/10622>  
 DOI: <http://dx.doi.org/10.3968/10622>

### INTRODUCTION

With the continuous deepening of the national optimization of service reform, the retail industry is increasingly actively. In 2016, the transformation and upgrading of retail enterprises were effective, and the growth of retail sales was slow and stable. The retail industry is developing well, the market is expanding and the scale is increasing.

The retail industry has become an essential component of China's economic growth. Retail industry capital structure, ownership structure, internal control, enterprise

size and other factors have impacted on the financial performance of Listed Retail companies at different levels. Therefore, through the financial performance evaluation, we can discover the advantages and disadvantages of the retail industry, make up for the deficiencies, further explore the factors which affect the financial performance of the retail industry, and then put the right remedy for the existing problems to give countermeasures.

### 1. THEORIES

Retail refers to the direct sale of goods purchased from wholesalers, middlemen or manufacturers to consumers by individuals or companies engaged in marketing activities ranging from producers to consumers (Wei, 2011).

Enterprise financial performance evaluation refers to the use of certain technical analysis methods from the perspective of financial accounting to conduct a scientific evaluation of enterprise operating benefits. The financial performance evaluation of listed companies is the core part of the performance evaluation of listed companies. Financial performance mainly refers to the profitability, debt paying ability, operation ability and development ability of the enterprise (Zhang, 2017, pp.90-92).

### 2. DATA AND METHODOLOGY

#### 2.1 Data

According to the Guidelines on Classification of Listed Companies in China, till this March, there are 95 retail listed companies in Shanghai and Shenzhen A stock market in total. This research is based on the 2016 financial reports of all those retail listed corporations.

To make sure the sample valid, some abnormal samples were dropped. Details are as follows:

(1) 2 ST companies were excluded from the sample

for continuous loss in more than 2 years or insolvency. (2) 8 unlisted companies till 2016 were excluded from the sample because those companies lack complete financial information of 2016 which is important for this study. (3) 18 companies were excluded for lacking financial information, which may lead to unnecessary difficulty in counting, influencing the conclusion's reliability.

67 retail listed companies are composed of the sample and all the data is from Guotai'an database.

## 2.2 Method

With the use of SPSS19.0, factor analysis are applied to evaluate the financial performance of these 68 retail listed corporations.

## 3. RESULTS

### 3.1 KMO and Bartlett Tests

In this section, KMO and Bartlett tests are used to judge whether the variables are suitable for this analysis. KMO is an indicator to judge whether there are obvious correlations between variables. Bartlett tests are meant to decide what kind of type this matrix is (Table 1).

**Table 1**  
**KMO and Bartlett Tests Outcome**

Kaiser-Meyer-Olkin measurement		
		.62
Bartlett's sphericity test	Chi-square	262.01
	df	36
	Sig.	.000

In table 3, 4 common factors were selected because their eigenvalue is above 1. They extracted 80.05% of the total initial variables, which means most information of initial 9

**Table 3**  
**Explanation of Total Variance**

factors	Initial eigenvalue			Total	Variance%	Accumulative%	Total	Variance%	Accumulative%
	Total	Variance%	Accumulative%						
1	2.835	31.21	31.21	2.835	31.496	31.496	2.702	30.025	30.025
2	1.689	18.74	49.95	1.689	18.765	50.262	1.732	19.248	49.273
3	1.556	17.29	67.24	1.556	17.288	67.549	1.622	18.022	67.295
4	1.114	12.81	80.05	1.144	12.715	80.265	1.167	12.969	80.265
5	.707	7.86	87.91						
6	.434	4.85	92.76						
7	.367	4.08	96.84						
8	.174	1.93	98.77						
9	.095	1.23	100						

To have a better understanding of the common factors in practical, the factors were being rotated to move toward different directions in the interval of (0, 1). Then

Table 1 shows that KMO is 0.62, meaning that many variables has high correlations. Bartlett test is lower than significant level 0.05; meaning that it is correlation matrix rather than identity matrix and all variables has some correlations. The above tests represent that the financial information being selected is suitable for factor analysis when evaluating financial performance (Kaplan & Norton, 1992, pp.71-79; Hart, 2001, pp.1079-1100).

### 3.2 Principal Component Analysis

Principal component analysis is applied to extract the common factors and the outcomes are as follows, Table 2 has shown that the original communalities are between 0.624 and 0.875 and the lowest level of effective communalities is 0.6, which means that most information of original variables can be extracted by common factors. Thus we can keep all variables.

**Table 2**  
**Communalities**

	Beginning	Extraction
Return of Assets	1.000	.875
Return of Equity	1.000	.869
Debt to Assets Ratio	1.000	.781
Quick Ratio	1.000	.873
Cash Ratio	1.000	.873
Total Assets Turnover	1.000	.780
Total Assets Growth Rate	1.000	.841
Current Asset Turnover	1.000	.702
Net Profit Growth Rate	1.000	.624

variables has been extracted. Thus, it is absolutely feasible using these four common factors to evaluate the financial performance of listed companies in retail industry.

the rotated component matrix was obtained after using varimax rotation method. The results were shown in table 4.

**Table 4**  
**Rotated Component Matrix**

	Components			
	1	2	3	4
Quick ratio	.927			
Cash ratio	.911			
Debt to Asset Ratio	-.878			
Total Assets Turnover		.884		
Current Asset Turnover		.792		
Return of Equity			.913	
Return of Assets			.875	
Total Assets Growth Rate				.915
Net Profit Growth Rate				-.577

The first common factor  $F_1$  was named solvency factor for higher loads in quick ratio, cash ratio, and debt to asset ratio which represent solvency of the company.

The second common factor  $F_2$  was named operating capacity factor for higher loads in the index of total assets turnover and current asset turnover. These two indicators show the operating ability of the company.

The third common factor  $F_3$  was named profitability factor for better performance in ROA and ROE which show the ability the company have to make profits.

The fourth common factor  $F_4$  was named development capacity factor for higher loads in total assets growth rate and net profit growth rate which indicate the development capacity of the company

**3.3 Calculations of All Common Factors and the Integrated Score**

Table 5 is component score coefficient matrix, according to which, the four factors' score functions were obtained. With the new score function, common factors' score of the retail listed companies can be calculated.

$$F_1=0.082X_1-0.127X_2-0.338X_3+0.347X_4+0.332X_5+0.060X_6-0.042X_7+0.087X_8+0.046X_9,$$

$$F_2=0.058X_1-0.074X_2-0.076X_3+0.013X_4-0.047X_5+0.526X_6+0.457X_7+0.275X_8+0.127X_9,$$

$$F_3=0.533X_1+0.571X_2+0.052X_3-0.013X_4-0.011X_5-0.035X_6-0.003X_7+0.075X_8+0.053X_9,$$

$$F_4=0.087X_1-0.052X_2-0.081X_3-0.003X_4-0.072X_5+0.083X_6+0.041X_7-0.458X_8+0.788X_9$$

**Table 5**  
**Component Score Coefficient Matrix**

	Components			
	1	2	3	4
Return of Assets $X_1$	.082	.058	.533	.087
Return of Equity $X_2$	-.127	-.074	.571	-.052
Debt to Asset Ratio $X_3$	-.338	-.076	.052	-.081
Quick ratio $X_4$	.347	.013	-.013	-.003
Cash ratio $X_5$	.332	-.047	-.011	-.072
Total Assets Turnover $X_6$	.060	.526	-.035	.083
Current Asset Turnover $X_7$	-.042	.457	-.003	.041
Net Profit Growth Rate $X_8$	.087	.275	.075	-.458
Total Assets Growth Rate $X_9$	.046	.127	.053	.788

The following formula was used to calculate the integrated score  $F$  over financial performance of all listed companies this research selected.

$$F = \sum (d_j * F_j)$$

In this formula,  $d_j$  ( $j=1,2,3,4$ ) serves as weight, which means the proportion of the  $J$ th common factor's variance accounted for in the accumulated variance including all 4 common factors. The outcomes are as following: the weight of solvency factor is 0.3742, the weight of operating capacity factor is 0.2397, the weight of profitability factor is 0.2244 and the weight of development capacity factor is 0.1617, so the integrated score can be shown as:

$$F=0.3742 \times F_1+0.2397 \times F_2+0.2244 \times F_3+0.1617 \times F_4$$

There are 33 listed companies, accounting for 50% of the total sample whose combined score is less than 0 of the retail industry. Only 3 listed retail companies with comprehensive scores greater than 1

**CONCLUSIONS**

In this study, we use factor analysis method to compare the financial performance of listed retail companies horizontally. We can get the level of the development of the company in the industry. Because the data of every year are available, every year factor analysis can be carried out and obtained a comprehensive score, which is

a dynamic and changing analysis process. It provides us the direction for the improvement of enterprise's financial performance.

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