

Research on Scisplay Financial Performance Evaluation

Muxi Yuan

School of Economics and Management, Beijing Jiaotong University, Beijing 100091, China

Abstract: This paper analyzes the financial indicators of listed companies by factor analysis. This paper collects the financial data of scisplay Company from 2018 to 2022, selects fourteen indicators that reflect the solvency, operating ability, profitability and development ability, and makes empirical analysis and comprehensive evaluation on the financial performance in recent years. The results show that there are risks in the financial operation of scisplay Company, a US stock company, and the development of various financial capabilities is relatively unbalanced.

Keywords: Factor analysis, Performance evaluation, Financial indicators, Scisplay company.

1. Introduction

The video game industry is intensely competitive and subject to rapid changes in consumer preferences and frequent new product introductions. The competitive landscape consists of video game and related specialty stores, mass merchants and regional chains; computer product and consumer electronics stores; toy retail chains and direct sales by software publishers. online environments have also become more competitive with the likes of Sony (PlayStation Network), Microsoft (XBox Live), Nintendo (Nintendo Switch Online), as well as other online retailers and game rental companies gaining shares of digital software sales. The Coronavirus has accelerated spending online which has benefited leading players that already have a sophisticated online business model in place as well as businesses that are considered as essential such as supermarkets which have continued to sell gaming software. Factor analysis was used to construct a model for Scisplay financial performance It is not only of positive significance to the long-term development of the company, but also a reference for other game industry companies to make evaluation, find the changing trend of the overall performance level, analyse the existing problems and give reasonable suggestions.

2. Literature Review

Financial performance evaluation is the use of financial indicators of the performance of the company in a comparative analysis of a kind of evaluation method, first of all, according to the target company's industry categories and characteristics of the industry, select a series of financial index to scientific evaluation of enterprise performance, and score the evaluation results, find the problems and short board, formulate development strategies for managers, investors and enterprises. This paper chooses the factor analysis method to analysis the financial performance of Scisplay. Factor analysis is used to analyze financial indicators. Factor analysis principle is an analysis method that extracts a few principal components that can represent all variables from a number of interrelated variables, and evaluates the whole by scoring the principal components in each variable and comprehensive scores [1-8].

3. US Stock Company's Financial Evaluation System Construct

In this paper, the construction of the basic framework of the evaluation index system is based on the table of major regulatory indicators of enterprises and related literature research. Combined with quantitative indicators and the characteristics of corporate finance, the evaluation index of corporate finance is selected from multiple levels and angles. Finally, the basic framework of the evaluation index system is as follows: solvency, operating ability, profitability and development ability. Explanatory variables include current ratio, quick ratio, asset-liability ratio (%), equity multiplier, current asset turnover rate (times), fixed asset turnover rate (times), total asset turnover rate (times), gross profit margin of sales (%), net profit margin of sales (%), return on equity (average) (%), net profit margin of total assets (%), and operating profit/current liabilities. The specific index system is shown in Table 1.

4. Empirical Analyses

4.1. Factor Analysis Adequacy Test

In order to ensure the feasibility of factor analysis on the original data, firstly, KMO test and Bartlett spherical test are carried out on whether the original variables can meet the basic conditions for factor analysis.

KMO test, Bartlett spherical test standard: KMO value is selected between 0 and 1. If KMO value is closer to 1.0, the results show that there are many common factors among the selected original variables, that is, the better the effect of factor analysis of these variables is, the best effect is greater than 0.9, more than 0.7 is acceptable, and less than 0.5 is not suitable for factor analysis. Bartlett spherical test, approximate chi-square, significance $P < 0.001$ indicates that the variables are highly correlated, which is enough to provide a reasonable basis for factor analysis. The test results of KMO and Bartlett are as follows. It can be seen from the results that KMO value is $0.581 > 0.5$, and the significance $p = 0.000$, which indicates that these variables are suitable for factor analysis, and the variables are highly correlated, which can provide a reasonable basis for factor analysis.

Table 1. Index system construction

| Criteria layer | Specific indicators | attribute |
|---------------------|--|-----------|
| debt paying ability | liquidity ratio | + |
| | quick ratio | + |
| | Asset liability ratio (%) | - |
| | Equity multiplier | + |
| operating capacity | Turnover rate of current assets (times) | + |
| | Turnover rate of fixed assets (times) | + |
| | Total assets turnover rate (times) | + |
| profitability | Gross profit margin of sales (%) | + |
| | Net profit rate of sales (%) | + |
| | Return on net assets (average) (%) | + |
| | Net interest rate of total assets (%) | + |
| Developing ability | Operating profit/current liabilities (%) | + |
| | Year-on-year growth rate of operating profit (%) | + |
| | Year-on-year growth rate of operating income (%) | + |

Table 2. KMO and Bartlett test

| | | |
|--|---|---------|
| Kaiser-Meyer-Olkin measurement of sampling adequacy. Bart's sphericity test | Approximate chi-square freedom significance | .581 |
| | | 272.233 |
| | | 55 |
| | | .000 |

After the preliminary test, the variance of the common factors extracted from the explanatory variables is determined, and the principal component analysis is the selected method. If the selected common factor can represent most of the information in the data, it indicates that the common factor is representative. As shown in the common factor variance in the following table, the information extracted from each

original variable in this analysis is given. For example, the common factor variance of flow rate is 0.983, which indicates that several common factors can explain 98.3% of the variance of flow rate. In addition, most of the variance of variables are above 90%. Therefore, the overall effect of the data extracted by factor analysis is ideal.

Table 3. Common factor variance

| | initial | draw |
|--|---------|------|
| Z flow ratio | 1.000 | .983 |
| Z quick ratio | 1.000 | .983 |
| Z asset-liability ratio | 1.000 | .997 |
| Z equity multiplier | 1.000 | .996 |
| Z turnover rate of current assets | 1.000 | .961 |
| Z turnover rate of fixed assets | 1.000 | .967 |
| Z total assets turnover rate | 1.000 | .995 |
| Z gross profit margin of sales | 1.000 | .951 |
| Z net profit rate of sales | 1.000 | .969 |
| Average return on equity z | 1.000 | .943 |
| Z net interest rate of total assets | 1.000 | .972 |
| Z Operating profit current liabilities | 1.000 | .893 |
| Z Year-on-year growth rate of operating profit | 1.000 | .826 |
| Z Year-on-year growth rate of operating income | 1.000 | .795 |

Extraction method: Principal component analysis.

4.2. Data Standardization

Due to the difference of measurement, the data will be standardized. Names and data of standardized indicators are as follows.

4.3. Extract Common Factors

As shown in Table 4, the characteristic root and variance contribution rate table gives the explanation of the total

variance of the original variable by each principal component. According to the results, the total variance of common factor 1 interpretation is 54.901%, which means that common factor 1 can cover 54.901% of all the information contained in the original data. The total variance of common factor 2 interpretation is 23.088%, which means that common factor 2 can cover 23.088% of all the information contained in the original data. The total variance of common factor 3

interpretation is 9.307%, which means that common factor 3 can cover 9.307% of all the information contained in the original data. The total variance of common factor 4 interpretation is 7.191%, which means that common factor 4 can cover 7.191% of all the information contained in the original data.

It can also be seen from the gravel diagram results in the following figure that component 1, component 2, component 3 and component 4 occupy a very significant factor position, and the values of their eigenvalues are all greater than 1. Therefore, it is reasonable to extract four common factors.

Table 4. Explanation of Total Variance

| component part | Initial eigenvalue | | | Extract the sum of load squares. | | | Sum of squares of rotating loads | | |
|----------------|--------------------|---------------------|-------------|----------------------------------|---------------------|-------------|----------------------------------|---------------------|-------------|
| | amount to | Variance percentage | Cumulative% | amount to | Variance percentage | Cumulative% | amount to | Variance percentage | Cumulative% |
| one | 7.686 | 54.901 | 54.901 | 7.686 | 54.901 | 54.901 | 4.768 | 34.058 | 34.058 |
| 2 | 3.232 | 23.088 | 77.990 | 3.232 | 23.088 | 77.990 | 4.568 | 32.626 | 66.684 |
| three | 1.303 | 9.307 | 87.297 | 1.303 | 9.307 | 87.297 | 2.563 | 18.305 | 84.989 |
| four | 1.007 | 7.191 | 94.488 | 1.007 | 7.191 | 94.488 | 1.330 | 9.499 | 94.488 |
| five | .529 | 3.776 | 98.264 | | | | | | |
| six | .147 | 1.047 | 99.310 | | | | | | |
| seven | .055 | .392 | 99.703 | | | | | | |
| eight | .027 | .191 | 99.894 | | | | | | |
| nine | .009 | .065 | 99.959 | | | | | | |
| 10 | .004 | .026 | 99.984 | | | | | | |
| 11 | .002 | .014 | 99.998 | | | | | | |
| 12 | .000 | .002 | 100.000 | | | | | | |
| 13 | 5.932E-7 | 4.237E-6 | 100.000 | | | | | | |
| 14 | 1.110E-16 | 7.930E-16 | 100.000 | | | | | | |

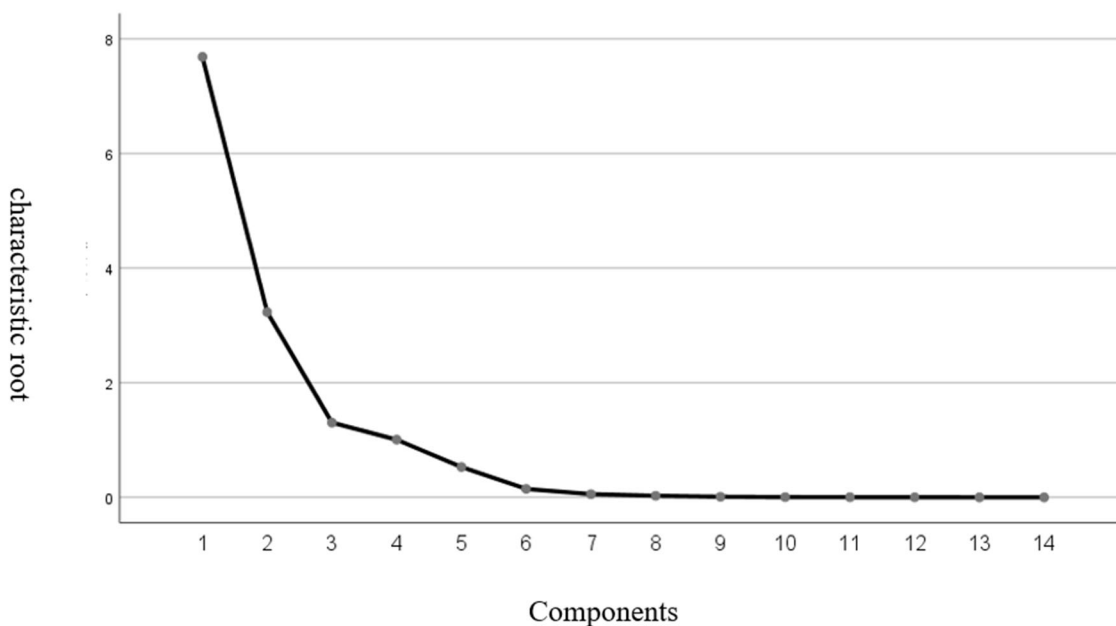


Figure 1. Gravel diagram

4.4. Naming of Common Factors

According to the factor load matrix after orthogonal rotation in the following table, the larger the correlation coefficient value, the greater the representativeness of the factor to the original variable. Taking 0.5 as the importance standard, it can be seen that the relationship between the first factor and the original variables is larger among the four factors, indicating that it has the largest amount of explanation

for the original variables. Finally, the retained correlation coefficient values are shown in Table 5. The first factor is heavily loaded on four variables: Z current ratio, Z quick ratio, Z asset-liability ratio and Z equity multiplier. These variables represent solvency, so the first factor is named as solvency factor; Similarly, the second factor is named as the operational capability factor; The third factor, profitability, is named as the population change factor; The fourth factor, profitability, is named development ability factor;

Table 5. Composition Matrix A after Rotation

| | component part | | | |
|--|----------------|-------|-------|------|
| | one | 2 | three | four |
| Z flow ratio | .873 | | | |
| Z quick ratio | .873 | | | |
| Z asset-liability ratio | .907 | | | |
| Z equity multiplier | .907 | | | |
| Z turnover rate of current assets | | .824 | | |
| Z turnover rate of fixed assets | | .935 | | |
| Z total assets turnover rate | | .963 | | |
| Z gross profit margin of sales | .820 | | | |
| Z net profit rate of sales | .907 | | | |
| Average return on equity z | | | .852 | |
| Z net interest rate of total assets | | | .730 | |
| Z Operating profit current liabilities | | | .628 | |
| Z Year-on-year growth rate of operating profit | | -.686 | | .526 |
| Z Year-on-year growth rate of operating income | | | | .873 |

4.5. Calculate the Common Factor Score

According to the scores of each factor calculated by spss25.0: FAC1, FAC2, FAC3, FAC4, combined with the above four common factors obtained by spss25.0, the total variance value is explained as the weight of each factor, and

then the weighted average sum is used to calculate the comprehensive score of enterprise financial status evaluation. The formula is as follows:

$$\text{Comprehensive } f = (0.54901 * \text{fac1} + 0.23088 * \text{fac2} + 0.09307 * \text{fac3} + 0.07191 * \text{fac4}) / 0.94488$$

Table 6. factor score

| | FAC1 | FAC2 | FAC3 | FAC4 | F zong |
|--------------------------------|----------|----------|---------|----------|--------|
| 2018 Annual Report | -1.87499 | 1.95602 | -.11568 | -1.02485 | -.70 |
| First Quarterly Report of 2019 | -2.50974 | -1.06275 | -.79454 | 1.53859 | -1.68 |
| 2019 interim report | -.18969 | -.28233 | 2.50836 | .30638 | .09 |
| 2019 Third Quarterly Report | .01361 | .37667 | 1.75087 | .12764 | .28 |
| 2019 Annual Report | .47788 | 1.44577 | .32897 | .23329 | .68 |
| Quarterly report in 2020 | .43347 | -1.13706 | .30881 | -1.18748 | -.09 |
| Mid-year report 2020 | .78891 | -.23252 | -.19105 | .80404 | .44 |
| Quarterly report in 2020 | .87800 | .37888 | -.44389 | 1.12756 | .64 |
| 2020 annual report | .81829 | .87571 | -.67104 | 1.23838 | .72 |
| Quarterly report of 2021 | .31888 | -1.19491 | -.22696 | .69808 | -.08 |
| 2021 mid-year report | .45411 | -.45703 | -.64780 | -.64970 | .04 |
| Third Quarterly Report of 2021 | .52828 | .14997 | -.91134 | -.76613 | .20 |
| 2021 Annual Report | .12380 | .45285 | -.89933 | -1.03729 | .02 |
| Quarterly report of 2022 | -.26084 | -1.26928 | .00462 | -1.40851 | -.57 |

5. Comprehensive Analysis

Generally speaking, when the value of factor score is less than 0, it means that the financial capability of the enterprise is not satisfactory; On the contrary, when the value is greater than 0, it means that the enterprise has better financial ability. As can be seen from Table 6, the factor scores are greater than 0 and less than 0, which indicates that there are risks in the financial operation of sciplay Company. According to the ranking of sciplay Company's financial comprehensive scores in each quarter from 2018 to 2022, as shown in Figure 4 below, it can be seen that sciplay Company's financial factor

comprehensive scores ranked first in 2020, and the comprehensive scores in each quarter in 2020 were in the top position, with satisfactory financial ability; In the first quarter of 2018 and 2019, the ranking was lower, and the comprehensive score was too low, indicating that the comprehensive performance of financial ability was worrying; In 2021 and the first quarter of 2022, the ranking was low, and the financial performance was average. Based on the analysis of four common factor scores, in each quarter of 2018-2022, the scores of the four common factors are all negative, which indicates that the development of various financial capabilities of sciplay is relatively unbalanced.

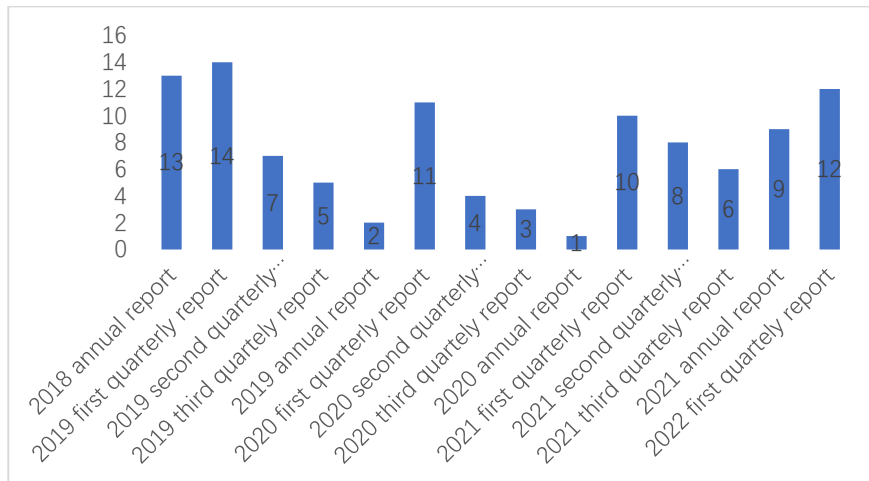


Figure 2. Ranking of comprehensive financial scores in each quarter from 2018 to 2022

References

- [1] Adra, S., and L. G. Barbopoulos. The Valuation Effects of Investor Attention in Stock-Financed Acquisitions[J]. *Journal of Empirical Finance*, 2018, 45:108-125.
- [2] Ahmed, W., H. H. Khan, and A. Rauf, et al. Simultaneous Equation Estimation in Finance and Corporate Financial Decision: Empirical Evidence from Pakistan Stock Exchange[J]. *Journal of Asian Finance Economics and Business*, 2021, 8(3):11-21.
- [3] Aktas, N., K. Andries, and E. Croci, et al. Stock Market Development and the Financing Role of IPOs in Acquisitions[J]. *Journal of Banking & Finance*, 2019, 98:25-38.
- [4] Arraut, I., J. A. L. Marques, and S. Gomes. The Probability Flow in the Stock Market and Spontaneous Symmetry Breaking in Quantum Finance[J]. *Mathematics*, 2021, 9(21):2777.
- [5] Belcaid, K., and A. El Ghini. Macro-finance Determinants and the Stock Market Development: Evidence From Morocco[J]. *Middle East Development Journal*, 2021, 13(1):99-127.
- [6] Bouteska, A., and B. Regaieg. Psychology and Behavioral Finance Anchoring Bias by Financial Analysts On the Tunisian Stock Market[J]. *Euromed Journal of Business*, 2020, 15(1):39-64.
- [7] Canil, J., and S. Karpavicius. Are Employee Stock Option Proceeds a Source of Finance for Investment?[J]. *Journal of Corporate Finance*, 2018, 50:468-483.
- [8] Cao, F., K. Ye, and N. Zhang, et al. Trade Credit Financing and Stock Price Crash Risk[J]. *Journal of International Financial Management & Accounting*, 2018, 29(1):30-56.