

Original Paper

Evaluation of iQiyi Financial Pressure Based on Entropy Weight -TOPSIS Method

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Abstract

Financial pressure refers to the behavioral pressure formed by internal and external factors acting on the financial activities of enterprises, which is the pressure that enterprises must bear in the actual production and management activities. This paper takes iQiyi Company as a case, selects financial statement data from 2019 to 2023, selects indicators from five dimensions of solvency, operating capacity, profitability, development capacity and cash flow capacity, and makes a comprehensive evaluation of its financial pressure by combining entropy weight-TOPSIS evaluation system. The results showed that iQiyi's financial situation continued to deteriorate from 2019 to 2021, began to improve in 2022, and 2023 was the best financial situation and faced the least financial pressure. In the end, it provides suggestions on how to prevent and control financial pressure of iQiyi, and provides reference for other Internet video enterprises in China to evaluate and prevent financial pressure.

Keywords

iQiyi Company, Financial stress, Entropy weight -TOPSIS evaluation system

1. Introduction

With the rise and popularity of the Internet, China's network video industry has developed very rapidly in recent years. China Internet Network Information Center (CNNIC) released the 52nd Statistical Report on China's Internet Development in August 2023. According to the report, as of June 2023, the number of online video users was 1.044 billion, an increase of 13.8 million compared with December 2022, accounting for 96.8% of the total Internet users. It can be seen that China's network video industry has a massive user base, and has a huge potential market value. Among them, iQiyi and Youku, Tencent video three, whether in terms of user visits, the number of members or revenue scale, are in the first echelon of the domestic Internet long video industry. Although China's long video enterprise scale

growth is amazing, but from the perspective of net profit has been generally loss. In order to expand the scale of users and seize the market, the major long video companies continue to pour capital into buying legitimate copyrighted videos, and continue to develop homemade content. The revenue of long video enterprises mainly relies on value-added member services and advertising services, but only by these two types of income, and can not meet its huge capital expenditure and cost. In recent years, the rise of short video platforms has also had a huge impact on long video companies. In addition, due to its blind pursuit of business expansion speed, its weak risk awareness leads to poor ability to identify and prevent financial pressure. In this case of internal and external troubles, long video enterprises are generally facing no small financial pressure.

The domestic long video industry is in the stock game stage, the enterprises continue to expand the scale, seize the market, want to develop steadily in the fierce competition, the evaluation of financial pressure research is essential. Iqiyi is a leading enterprise in the long video industry, and the evaluation study on iqi's financial pressure will have a strong reference significance for other growing Internet video enterprises.

2. Literature Review

2.1 Literature Research on Financial Stress

There are few researches on financial stress at home and abroad, and no unified definition has been formed. From the financial point of view, financial pressure refers to the behavioral oppression formed by internal and external factors acting on the financial activities of enterprises, which is the pressure that enterprises must bear in the actual production and management activities. Duan, Wang and Gan (2014) believe that the financial pressure of an enterprise is formed by the joint action of the internal and external environment of an enterprise on the financial activities of an enterprise, and it is the pressure that the financial activities of an enterprise must bear. Such pressure will affect the financial activities and daily operation and management of an enterprise to a certain extent, and will also affect the management of an enterprise. In particular, the main management brings a certain burden of psychological pressure. According to Li and Duan (2016), financial pressure has a two-sided impact on enterprise investment activities, which is mainly influenced by three specific forms of pressure: debt paying pressure, operating capacity and profitability. Among them, the debt paying pressure acts on the financial pressure through direct transmission and affects the investment behavior of enterprises, while the operating capacity and profitability have an effect on the investment behavior of enterprises through the indirect transmission of financial pressure, and the impact degree is weaker than that of debt pressure. Wang, Wang and Cui (2021) adopted a model called BP neural network to further study and test the financial pressure of pharmaceutical enterprises after simplifying various indicators with principal component analysis. The results show that the high stability and accuracy of PCA-BP neural network has a positive impact on the construction of financial stress test index system suitable for listed companies in China's pharmaceutical manufacturing industry, and it is considered that this system can

be better applied to other types of enterprises.

2.2 Long Video Industry Literature Research

At present, the literature research on the long video industry mainly focuses on its business model and financial risk. Ai and Zhou (2014) believe that although the success of Netflix cannot be replicated in China in the short term, leading Internet video enterprises in China, such as iQiyi, Tencent Video and Youku Video, can learn from the business model of Netflix and start to deploy big data to dominate the production of video content through big data analysis. Leng (2017) proposed that the current profit models of Internet video websites mainly include membership income, advertising income and other derivative income. The research believes that the future content payment model will become the mainstream, and the improvement of mobile Internet technology will also promote the survival and development of Internet video enterprises. Liang (2022) believes that the accurate quadratic positioning of Station B and its diversified business model provide a wealth of high-quality services for consumers, and promote the rapid growth of its business income, forming a positive cycle. Lai (2018) found that the financial risks of the Internet video industry are mainly: the income is not enough to cover the previous cost and expenditure, and the short-term funds obtained by external financing are difficult to meet the dual needs of daily operation and continuous investment. According to Huang (2018), the financial risks faced by LeEco are not only from the high content cost that is common in the industry, but also from the financing pressure caused by other assets.

Through literature review, it is found that there are few studies on the evaluation of financial pressure in the long video industry. Therefore, this paper takes iQiyi Company as an example, combines the index weight with the evaluation results based on entropy weight-TOPsis method, and scientifically evaluates its financial pressure.

3. Iqiyi Company Overview

Iqiyi is an Internet video website founded by Gong Yu on April 22, 2010, and launched the "iQiyi" brand and launched a new logo on November 26, 2011. On May 7, 2013, Baidu acquired PPS Video business and merged with iQiyi, which is now Baidu's long-form video platform. On March 29, 2018, iQiyi was listed on NASDAQ. Since its establishment, iQiyi has relied on continuous provision of a large number of high-quality OGC content (content produced by professional organizations) such as film and television, variety shows, documentaries and other content to acquire users and enhance user adhesion. Its main revenue comes from membership services and advertising services. At present, in order to save costs and the needs of the company's development, iQiyi has completed the strategic transformation from "purchasing copyright" to "self-made content", and the company is no longer limited to buying exclusive copyright, but has invested heavily in creating self-made content, which has greatly saved content costs. Iqiyi's self-made movies and TV plays and self-made variety shows have also won praise from everyone.

4. Construction of Financial Stress Evaluation System with Entropy Weight -TOPSIS Method

4.1 Indicator Selection

In the spirit of integrity and comparability, This paper selects the current ratio, cash ratio, asset-liability ratio, accounts receivable turnover, total assets turnover, current assets turnover, operating profit margin, return on equity, total assets return, operating income growth rate, operating profit growth rate, total assets growth rate and cash flow from five dimensions: debt paying ability, operating ability, operating profit growth rate, development ability and cash flow ability The debt ratio, operating cash ratio and cash recovery rate of all assets are 15 evaluation indicators to construct the financial pressure evaluation system of iQiyi. All data are from iQiyi's annual reports from 2019 to 2023.

4.2 Main Steps of Entropy weight-TOPSIS Method

(1) Standardized data processing and non-negative translation. In order to ensure comparability between the selected indicators, the raw data needs to be standardized. Among them, the positive indicators are processed in the positive direction, and the negative indicators are processed in the reverse direction. Since the process of calculating the weight of entropy method needs to transform the logarithmic function of the data, and the logarithmic function requires the data to be positive, then the data after normalization is carried out non-negative translation.

(2) Calculate the entropy value and determine the index weight. The

formula
$$e_j = -\frac{1}{\ln n} \sum_{i=1}^n P_{ij} \ln P_{ij}$$
 is used to calculate the entropy of each index, and then the weight of

each index is determined according to the formula
$$w_j = \frac{1-e_j}{\sum_{i=1}^m (1-e_j)}$$
. The smaller the entropy of the index, the greater the weight proportion. It shows that the greater the impact on the evaluation results of financial stress.

(3) Calculate the Euclidean distance D_i^+ , D_i^- and the relative proximity C_i to the ideal solution. The

relative proximity is calculated as
$$C_i = \frac{D_i^-}{D_i^+ + D_i^-}$$
. The closer the relative proximity value is to 1, the closer it is to the positive ideal solution, and the farther it is to the negative ideal solution, which means the less financial pressure the company faces and the higher the financial security of the company.

5. Analysis of Financial Pressure Evaluation Results of iQiyi

5.1 Analysis of Calculation Results by Entropy Weight Method

The entropy weight method is used to calculate the weight of iQiyi's financial pressure evaluation indicators from 2019 to 2023, and the weight ratio of 15 second-level financial indicators in each year

of the case enterprise is obtained, while the weight ratio of 5 first-level financial indicators is calculated. The results of entropy weight specific gravity are shown in Table 1.

Table 1. Calculation Results of Entropy Weight Method

Primary index	Secondary index	number	Information entropy value e	Information utility value d	Weight (%)	Total weight (%)
solvency	Current ratio	X1	0.6185	0.3815	9.62%	22.2%
	Cash ratio	X2	0.8130	0.1870	4.72%	
	Asset-liability ratio	X3	0.6882	0.3118	7.86%	
Operational capacity	Accounts receivable turnover rate	X4	0.6843	0.3157	7.96%	21.97%
	Turnover of total assets	X5	0.7477	0.2523	6.36%	
	Turnover of current assets	X6	0.6967	0.3033	7.65%	
profitability	Operating profit margin	X7	0.7915	0.2085	5.26%	20.14%
	Return on equity	X8	0.6333	0.3667	9.25%	
	Return on total assets	X9	0.7770	0.2230	5.63%	
Development ability	Revenue growth rate	X10	0.8060	0.1940	4.89%	15.09%
	Operating profit growth rate	X11	0.7669	0.2331	5.88%	
	Growth rate of total assets	X12	0.8287	0.1713	4.32%	
Cash flow capacity	Cash flow debt ratio	X13	0.7462	0.2538	6.40%	20.6%
	Operating cash ratio	X14	0.7089	0.2911	7.34%	
	Cash recovery rate on all assets	X15	0.7281	0.2719	6.86%	

It can be concluded from the data in Table 1 that the entropy weights of the five first-level indicators are, from the largest to the smallest, debt paying ability, operating ability, cash flow ability, profitability and development ability. In addition to the low development ability, the weights of the other four first-level indicators are very close, around 20%, and the weight difference between the overall five indicators is not significant, which means that the ability of these five indicators is very important for iQiyi to prevent and control financial pressure. Iqiyi needs to comprehensively improve the management level of these five first-level indicators. The following is an analysis of each level of indicators.

(1) Weight analysis of solvency index. Solvency is the ability of an enterprise to repay various debts. The weight of iQiyi's debt paying ability index is 22.2%, which is the highest among all first-level indicators, indicating that debt paying ability is particularly important for iQiyi to prevent and control financial pressure. The entropy weights of the following three secondary indexes are 9.62%, 4.72% and 7.86% respectively. The entropy weight of the current ratio is 9.62%, which is the highest among the five secondary indexes, and the entropy weight of the asset-liability ratio is 7.02%. Therefore, if iQiyi wants to improve its solvency, it should focus on the current ratio and asset-liability ratio. It can maintain the current ratio within a reasonable range by reasonably controlling current liabilities, and reduce the debt scale or increase equity financing according to its actual situation to reduce the asset-liability ratio.

(2) Weight analysis of operational capability indicators. Operation capacity reflects the capital turnover of the enterprise, and can reflect the management level and business status of the enterprise. The weight of iQiyi's operating capacity index is 21.97%, second only to its solvency. The entropy weight of the following three secondary indicators is 7.96%, 6.35% and 7.65% respectively, which are also at a high level, indicating that iQiyi should pay attention to the improvement of its operating capacity. Iqiyi is a leading enterprise in the Internet video industry and occupies a dominant position in the entire supply chain. However, due to the low output of iQiyi's high investment in assets, its operating capacity continues to deteriorate. Therefore, iQiyi must improve the efficiency of the use of assets.

(3) Profitability index weight analysis. Profitability is the ability of enterprises to obtain profits. The weight of iQiyi's profitability index is 21.97%, and the entropy weight of the following three secondary indicators is 5.26%, 9.25% and 5.63%, respectively. Although profitability is less important than debt paying ability, operating ability and cash flow ability from the perspective of index weight, profitability is crucial for the Internet video industry, which generally "increases revenue but does not increase profits", not only the guarantee of debt repayment, but also the key to iQiyi's ability to turn losses into profits, survival and development. Poor profitability can also affect investors' confidence in companies, which in turn affects their financing. Among the three secondary indicators of iQiyi's profitability, the weight of return on equity is much higher than the other two indicators. Therefore, iQiyi should improve its return on equity by expanding sales and saving costs, so as to enhance its profitability.

(4) Weight analysis of development ability indicators. Development ability is the growth ability shown by the enterprise in the process of operation. The weight of iQiyi's development ability index is 15.09%, accounting for the lowest proportion among the five first-level indicators. The entropy weight of the following three second-level indicators is 4.89%, 5.88% and 4.32%, respectively, accounting for a low proportion. Although according to the weight, the ability to develop is the five first-level indicators that have the least impact on the financial pressure of enterprises, in fact, the ability to develop is very important for Internet video enterprises. Iqiyi, Bilibili and other video companies can still be favored by investors in the case of annual losses, listed in the United States, because investors look at the future value of the enterprise, the development ability reflects the future development value of the enterprise.

If the development ability of the enterprise is too poor, it is likely to affect investors' confidence in the enterprise. Therefore, iQiyi can not ignore the improvement of development ability. Iqiyi should constantly innovate the content distribution model to meet the needs of more users and attract new users in order to obtain better growth prospects.

(5) Weight analysis of cash flow capability index. Cash flow capacity is the ability of an enterprise to obtain cash and the ability of cash flow to repay debts, reflecting the cash flow status of an enterprise. The weight of iQiyi's cash flow capability index is 20.6%, and the entropy weight of the following three secondary indexes is 6.40%, 7.34% and 6.86%, respectively. As of the end of 23, iQiyi has achieved positive operating cash flow for seven consecutive quarters, and the cash flow situation is good. Iqiyi will continue to introduce high-quality self-made content, guide users to pay, improve its profitability, increase the size of available cash holdings, and promote cash liquidity.

5.2 Analysis of TOPSIS Evaluation Results

TOPSIS method and the index weights calculated by entropy weight method were used to calculate the European distance and relative proximity values of iQiyi's evaluation indicators from 2019 to 2023, and the financial pressure was sorted according to the results. The results are shown in Table 2.

Table 2. Calculation Results of Entropy Weight Method

A	given	Positive ideal solution	Negative ideal	Proximity C	Sort result
year		distance D ⁺	solution distance D ⁻		
2019		0.177	0.173	0.494	3
2020		0.208	0.112	0.349	4
2021		0.231	0.062	0.213	5
2022		0.157	0.164	0.512	2
2023		0.092	0.233	0.717	1

According to the principle of TOPSIS method, the greater the relative proximity value, the better the financial condition of the company and the less financial pressure it faces. According to Table 2, the relative proximity of iQiyi is ranked as 2023, 2022, 2019, 2020 and 2021, which indicates that iQiyi's financial situation continues to deteriorate from 2019 to 2021, and begins to improve in 2022, its financial situation is better than the previous three years, and its financial situation is the best in 2023. Face the least financial pressure. The reasons for this change are as follows:

In 2020, due to the impact of the novel coronavirus epidemic, theatrical movies were affected, and iQiyi could not get new theatrical movies. The epidemic also affected the review of new dramas, which led to the delay of the broadcast of many TV dramas. Iqiyi's movies and TV dramas could not be launched for a long time, which seriously reduced the appeal of member services to users. In November, iQiyi raised membership prices again. Member price increases and a lack of quality content have led to

iQiyi's member revenue being much lower than in 2019. The advertising revenue of iQiyi, another major income, has also been greatly impacted. Due to the impact of the epidemic on the economy, brands will prioritize their limited advertising funds to the short video platform that occupies the most absolute time of the audience at present, and the advertising revenue left for the long video platform like iQiyi is not as good as before. In 2019, short video users spent more time than long videos for the first time, and this trend is even more pronounced in 2020. Short video, with its efficient algorithm matching mechanism and extremely low content cost, is also squeezing the living space of long video platforms such as iQiyi. By 2021, iQiyi's situation was even worse. Iqiyi's "Youth has You 3" was urgently halted because of the "milk pouring incident", the idol talent show variety can not continue to be held, iQiyi lost an important profit IP, and the related industries are also lost. In the same year, four of iQiyi's reformed dramas could not be broadcast due to policy reasons. The inability to broadcast hot content coupled with continued losses made the capital market lose confidence in iQiyi, and the market value evaporated more than 100 billion yuan in 21 years. In this year, iQiyi also faced a tight cash flow situation, making the content cost of the already high iQiyi situation more difficult, the company is facing unprecedented financial pressure. In 2022, in order to improve the situation of continuous losses, iQiyi implemented a series of measures to reduce costs and increase efficiency. On the one hand, non-core departments and large-scale layoffs are eliminated, on the other hand, content copyright procurement is reduced, and the proportion of self-made content is increased to save content costs. Iqiyi's financial situation has improved as the platform has saved a large amount of copyright fees due to the increase in self-made content. 23 years of continued cost reduction and efficiency increases and the explosion of "Crazy" made iQiyi achieve a profit on the net profit for the first time.

6. Iqiyi Financial Pressure Prevention and Control Suggestions

6.1 Vigorously Develop Self-made Content

In order to reduce costs and increase efficiency, iQiyi must complete the strategic shift from "buying copyright" to "making content", so as to reduce content costs. Vigorously develop self-made content, do not have to spend a lot of money as before to buy exclusive copyright, you can master the production cost of content, greatly saving the cost of the platform. At the same time, because the platform itself can also produce explosive content, it can also have better bargaining power when purchasing third-party content.

6.2 Strengthen Copyright Cooperation

In the past, various video platforms in order to compete for exclusive copyright, which boosted the crazy growth of film and television copyright costs. This high exclusive copyright fee often means a huge cost input, so in order to save copyright costs, the long video platform can strengthen copyright cooperation. Reduce the investment in copyright costs through cooperation, such as dividing accounts by learning from the way that movies are launched in theaters, sharing copyright, and sharing costs and benefits together, which can reduce costs and risks.

6.3 Optimize the Content Push Mechanism

The short video platform can push personalized content according to users' preferences by means of efficient algorithm recommendation mechanism. Bilibili also launched a number of content partitions, so that users can choose their favorite content partition to watch their favorite content. Iqiyi does not recommend content according to user preferences, nor does it set content partitions according to user preferences, but adopts an undifferentiated content push mode. This push mode not only wastes resources, but also causes users to go through a large number of searches to find their favorite content, which is not conducive to user acquisition and retention. Therefore, iQiyi needs to optimize the content push mechanism, use big data to analyze user preferences, and "correct the symptoms" in order to seize the real pain points of users and enhance user stickiness.

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