

A Study on School's Solvency and Investment Mechanism Based on Finance

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Abstract: In recent years, big data is becoming more and more popular. Many fields of finance, including schools, need the guidance of big data. The solvency of an enterprise is an important indicator of the school's financial situation and operating ability. This paper studies the solvency of an enterprise in combination with finance to provide more reliable business information for business operators and investors. This is convenient for operators and investors to make correct decisions. Then, the investment term model based on RE and RGR is established, and the optimal investment strategy is successfully determined for good grant foundation. On this basis, from the aspects of investment efficiency and cost performance, we evaluate and analyze the effectiveness of investment. Therefore, we establish a DEA cost performance analysis model to determine the school with the best unit investment return. DEA model can determine that the best school can make the most effective use of the limited financial investment, with the highest cost performance. All in all, its unit investment return is better than other schools.

1. Research background and significance

1.1 Background

Social progress and economic growth have promoted the development of China's financial industry, and more mathematical analysis theories have emerged. Financial mathematics is an important part of it [1]. The effective application of financial knowledge can provide effective help for the analysis of solvency. Solvency is a comprehensive index that can reflect the financial risk, cash flow control, financial management level and other information of an enterprise. Solvency refers to the bearing capacity or guarantee degree of an enterprise to repay its due debts, including the ability to repay short-term debts and long-term debts.

In order to improve the performance of American undergraduate education, the good grant foundation decided to invest in qualified schools. Therefore, the foundation needs to determine the schools invested and the investment amount of each school, and also needs to know the return of this investment and the duration of the investment. In order to get these results accurately, it is necessary to establish a reasonable model, extract the effective part of the data and evaluate the samples, and determine the investment school and amount. We have considered the school's academic and financial returns, and then determined the investment time. Based on our model, we put forward reasonable suggestions for the foundation in our letter.

1.2 Significance

William bourn Bach put forward a new index called "return on investment"[2]. The total financial return from an investment activity reflects the value of the investment. On this basis, add academic returns to fully reflect the investment value of the foundation.

This paper combines theoretical analysis with practical cases. In theory, scholars at home and abroad have studied the school investment mechanism from market, industry integration, and risk pricing and other aspects. Most of them are based on their own concerns in a certain field, or for the macro research of finance, combined with the research of a company's financial practice, especially the research of colleges and universities is still not common in academic articles. In this paper, the long-term solvency is calculated from asset liability ratio, interest capital ratio, interest coverage ratio and cash interest ratio. Then the investment mechanism is analyzed according to the index

model of the college.

2. Analysis of the long-term solvency of the school

The long-term solvency refers to the ability of the school to bear the debt and guarantee the debt repayment. Using borrowed funds to carry out production school activities, on the one hand, can promote the rapid development of the school, on the other hand, it will increase the cost of capital and financial risk of the school.

Table 1. Long term solvency index

Index		Year		
		2015	2016	2017
Stock index	Asset liability ratio	26.06%	17.87%	16.94%
	Interest bearing capital ratio	0	0	0
	Property ratio	35.25%	21.76%	20.39%
	Debt service coverage ratio	0.52	0.66	0.50
Flow index	Interest cover	1106.03	----	----
	Cash interest multiple	-260.33	6395.30	269.75

2.1 Asset liability ratio

Asset liability ratio refers to the ratio of all liabilities to all assets of an enterprise, which is an important indicator of the long-term solvency of an enterprise. This ratio is a measure of the overall debt position of an enterprise, reflecting the ability of an enterprise to repay its debts in a long period of time. For enterprises: Generally speaking, the appropriate level of asset liability ratio is 40% - 60%. The lower the ratio, the better for creditors. Because the owners (shareholders) of the company generally only bear limited liability, and once the company goes bankrupt and liquidates, the income from the realization of assets is likely to be lower than its book value. So if the index is too high, creditors may suffer losses. When the asset liability ratio is greater than 100%, it indicates that the company is insolvent, which is very risky for creditors. The asset liability ratio reflects the proportion of the funds provided by the creditors in the total funds and the degree of protection of the assets of the enterprise to the rights and interests of the creditors. The lower the ratio (below 50%) indicates the stronger the solvency of the enterprise.

According to the balance sheet of H private school in recent three years, its total liabilities increased from 321188808.21 to 344420095.65, and its total assets increased from 1232299602.92 to 2033583, 415.13 the growth rate of total assets is much larger than that of total liabilities, so the asset liability ratio of the enterprise in recent three years has also decreased significantly. From the above table, it can be seen that the debt operation ratio of the enterprise in recent three years is relatively small. From the perspective of creditors, the enterprise has guaranteed debt repayment, and the loan will not have too much risk, which is beneficial to the enterprise, but the low asset liability ratio may also reduce the enterprise Profit margin of shareholders.

2.2 Interest bearing capital ratio

Interest bearing capital ratio refers to the proportion of interest bearing liabilities other than commercial credit used by enterprises in all funds requiring direct return. According to the financial statements of the enterprise in the past three years, the current liabilities with interest and long-term liabilities with interest are both zero in the past three years, so the interest capital ratio is zero, which means that the enterprise has no financial liabilities in the past three years.

2.3 Interest cover

Interest cover ratio, also known as earned interest multiple, refers to the ratio of the enterprise's profit before interest and tax to the interest expense of the same period. It is an indicator to measure the enterprise's ability to pay interest on its liabilities (to measure the ability to pay interest on its borrowings). The larger the multiple is, the stronger the ability of the enterprise to pay the interest expense is.

According to the financial statement data of H private school in recent three years, the interest coverage ratio in 2015 is as high as 1106.03, which indicates that the enterprise has a strong ability to pay interest expenses. However, there is no interest expense in the financial expenses of the enterprise in 2016 and 2017, and there is no loan in the balance sheet, so it is unnecessary to calculate the interest coverage ratio.

2.4 Cash interest multiple

Cash interest multiple refers to the ratio between the net cash flow from operating activities of an enterprise and the interest expense paid by the enterprise in cash in the same period. According to the data of 2015 financial statements, the common stock dividend payable in the year was 30959950.00, while the cash paid for distribution of dividend, profit or interest repayment was 30315, 838.01.

It can be seen that the amount of common stock dividends to be paid in this year is so large that the cash paid by the enterprise to distribute dividends, profits or repay interest is not enough to pay its amount, so the multiple of cash interest is negative. In 2016 and 2017, although the enterprise's ability to pay interest on the basis of principal repayment was guaranteed, the cash interest multiple was not stable.

3. Analysis of school investment mechanism based on Finance

3.1 Definition of investment benefit index

In order to solve the investment benefit of good grant foundation to h school, we define the following indicators:

- Financial indicators

Secondary indicator: ROI

Index meaning: refers to the financial return obtained in an investment activity, and refers to the value to be returned through investment. It can be seen from references [3, 4] that this indicator is an important indicator to measure the value of investment, and also an important supplement to improve the effectiveness and reliability of investment analysis.

Secondary index: input output ratio Pro

Index meaning: in the investment time, the ratio of net income to total investment is used to measure the degree of income creation of a school. The larger the value is, the higher the degree of benefit creation is.

Calculation method: the accumulated net return capital within the investment life divided by the total capital investment.

- Academic indicators
- Institutional characteristics

Second level indicators: graduation rate, degree granting level, degree granting rate, student retention rate, teaching environment, teacher-student ratio, international teacher ratio and international student ratio.

Index meaning: it reflects the quality of a school's learning atmosphere, academic strength, popularity, etc. Data from.

- Academic reputation

Second level indicators: the influence degree of humanities, engineering technology, life science and medicine, natural science, social science and other disciplines in the academic community, the citation rate of papers, and the international academic reputation of research.

Index meaning: it reflects the academic ability of a school and its influence on the academic community. Data from.

- Talent development

Secondary indicators: Graduates' income, alumni awareness, and graduates' achievements.

Index meaning: it is an index to measure whether the school can cultivate students with both excellent character and learning and valuable to the society. Data from.

3.2 Acquisition of investment benefits

In this paper, the recovery benefit function is defined, which is used to express the functional relationship between input and output. According to the determined functional relationship, the relationship between input and output is obtained. Let it be the time, and $kt + b$ be the function of the linear change of school condition with time.

With the investment of funds, the benefit recovery shows a long-term, sustained and decreasing trend. After investing in the school, the benefit recovery shows a long-term, sustained and decreasing trend. On this basis, we construct the functions of RE and RGR.

3.3 Conclusion and analysis

According to the first level index data collected, in order to eliminate the different influence of these index intervals. First of all, we normalize the data and get the weight of academic indicators. Secondly, re is calculated with the obtained weight and normalized data, and the change trend of RE and RGR with time is obtained. As shown in the figure below:

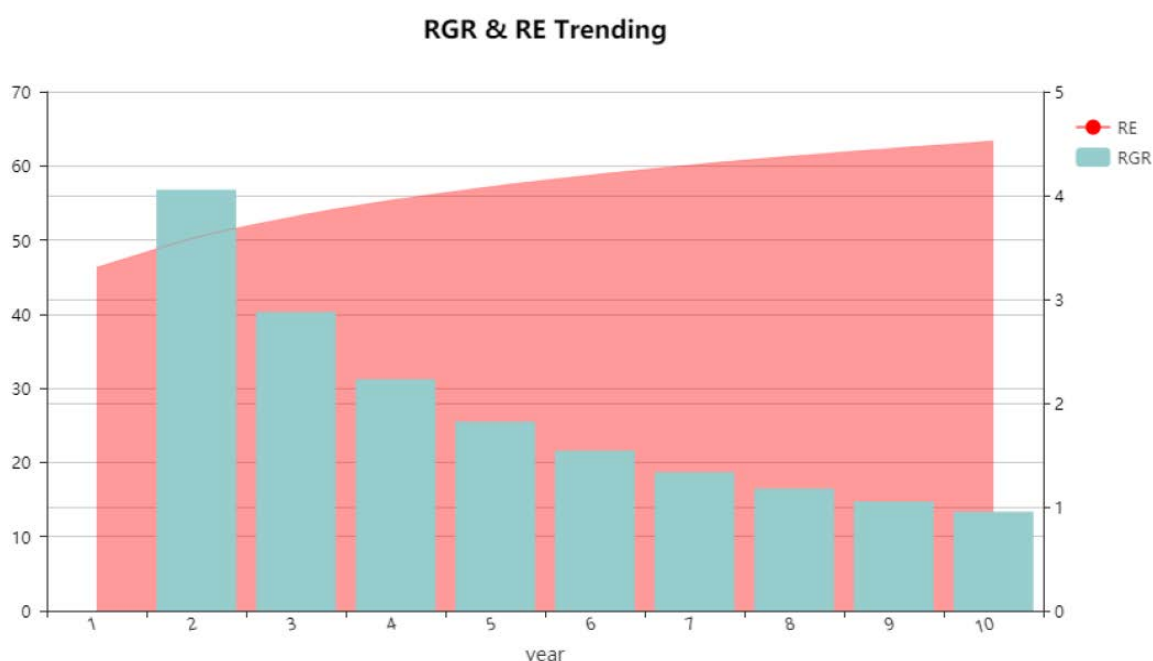


Figure 1. Change trend of RE and RGR

It can be seen from the above analysis that, with the change of time, re shows a slow increase trend, but RGR shows a gradual decrease trend, which is in line with the basic situation of foundation investment. Therefore, according to the change trend of RGR, when the growth trend of RGR slows down gradually, it is the best investment period.

Therefore, the investment period can be determined as 7 years, but the return benefit function is further analyzed, and the basic situation of the foundation investment is combined. It can be concluded that continuous and long-term investment and support in education will have long-term benefits and higher value for both schools and foundations.

4. Establish DEA cost performance analysis model

At present, domestic scholars use DEA method to evaluate the supply efficiency of public goods more and more. Tu Jun and Wu Guisheng use DEA—Tohi two-step method to measure the efficiency of agricultural innovation system in 30 provinces, cities and autonomous regions. The results show that the influencing factors include the level of rural basic education and natural disaster areas, while the government science and technology funds are not significant. In the investment industry, we usually face the situation that the investment funds are more profitable and the investment funds are less profitable, which is difficult to analyze. Therefore, we establish a new

model to evaluate the effectiveness of investment and investment.

In order to evaluate and analyze the effect of investment strategy, this paper analyzes the cost performance of investment. Set the annual input and output as an IAS unit, a total of... Units (etc.). X is the input variable, y is the input variable, each unit has m inputs and s inputs, VI is the weight of input in I , ur is the weight of input in R , so the efficiency evaluation score of IAS is $h=(uY)/(vX)$.

5. Conclusion

Solvency analysis is a very important part of school financial management. It can provide necessary management information to the management, investors and bondholders. Solvency also reflects the financial risk and development trend of the school. The three year cash flow ratio of H private school is relatively stable, and the debt operation ratio is relatively small. From the perspective of creditors, the enterprise can guarantee the debt repayment, and the loan will not have too much risk, so it can realize its own sustainable and long-term development.

After a certain amount of investment in each school, by analyzing the benefit and cost performance of each school, we can make the most effective use of the limited financial investment and determine the school with the highest cost performance. Therefore, its unit investment return is better than other schools. Compared with the contribution rate of the previous level-1 indicators, the order of the level-1 indicators has not changed, the degree granting rate and the contribution rate of the student funding indicators have declined to a large extent, and the contribution rate of the graduation income and the student repayment price indicators have significantly increased, while the other indicators only have a small-scale fluctuation.

The school scores are calculated according to the weight obtained by retaining all family income information. The top ten schools are mainly art schools. Considering the high cost of art colleges, the family income is better, which will affect the investment decision of the foundation. After taking the mean of family income, this error is avoided, and finally the correctness of taking the mean of family income is verified.

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