



Empirical Research of the Capital Structure Influencing Factors of Electric Power Listed Companies

Yuanxin Liu & Xiangbo Ning

College of Business Administration, North China Electric Power University

Beijing 102206, China

E-mail: yuanxin09@126.com

Abstract

In this article, we selected 25 electric power listed companies in the electric power industry as the samples to study the influences of micro factors on the capital structure of listed companies, and the sample period was from 2002 to 2007, and these micro factors mainly included company scale, profitability, growth, non-debt tax shields, fluidity and capital structure. The research results showed that the company scale, non-debt tax shields and assets structure were not significantly correlated with the capital structure, and the profitability was significantly negatively correlated with the capital structure, and the fluidity of the assets was negatively correlated with the capital structure. Finally, we put forward that the share-reform and the macro influencing factors should be further researched.

Keywords: Capital structure, Listed companies, Electric power industry

1. Research actuality

About the empirical research of the enterprise capital structure, there are two directions in foreign and domestic academe, and one direction is to take the MM theory as the center and mainly discuss the relationship between the enterprise value and the capital structure, and the other direction is to mainly research various factors influencing the enterprise capital structure, which belongs to the decisive factor school of capital structure. In this article, we mainly study the influencing factors of the capital structure of the listed companies in the electric power industry. According to existing literatures, the factors influencing the capital structure of Chinese listed companies mainly include following aspects.

1.1 Influence of financing cost

1.1.1 Cost of debt financing

Many researches took the ratio of the after-tax profit and the equity capital market value as the equity capital, and the result indicated that the equity capital cost of Chinese listed company was higher than the debt capital cost, so as viewed from enhancing the value of enterprise, the debt financing should be better than the equity financing.

1.1.2 Cost of equity financing

Most domestic scholars thought that the equity capital costs included nominal cost and actual cost, and the nominal capital cost meant the ratio of the after-tax profit and the equity market value, but in practice, only small part of the profits of the listed companies was awarded as bonus, and the ratio of the cash outflow induced by the bonus and the actual equity financing quantum was the actual cost of the equity financing. From this view, the research result is that the equity financing is better than debt financing.

1.2 Influences of company management characters

1.2.1 Influence of company performance

The results of the empirical research on the relationship between the company performance and the debt ratio can be basically divided into two sorts. (1) The debt ration and the company performance showed a negative correlation. Generally, when the profitability of the enterprise is strong, the enterprise can keep more surpluses and fewer debts. And when the enterprise is in the loss, because it can not fulfill the condition of equity financing, it has to borrow large numbers of short-term debts to fulfill the demands of the capital. So the negative correlation between the profitability and the debt ratio can be easily understood and accepted. (2) The debt ratio and the company performance showed a positive correlation. Taking the net profit/ primary business income, and the net assets yield as the explanation variables,

and combining the empirical results with the balance theory, we can obtain the result that the listed company with strong profitability has relatively low financial risk, so the enterprise can select the high capital structure ratio, so the profitability and debt ratio present a positive correlation relationship.

1.2.2 Influence of enterprise scale

The results of the empirical research on the relationship between the enterprise scale and the debt ratio can be divided into three sorts. (1) The debt ratio and the enterprise scale showed a negative correlation. Taking the assets guarantee values and the total assets logarithm as the explanation variables, the empirical analysis indicated that both variables presented significant negative correlation, and with the expansion of the scale of the listed company, the debt would decline. (2) The relation between the debt ratio and the enterprise scale is not significant. Taking the primary business income logarithm and the assets guarantee value as the explanation variables to regressively analyze, the results indicated that though the enterprise scale presented positive correlation with the debt ratio, but the relation was not significant. (3) The debt ratio and the enterprise scale showed a positive correlation. Taking the total assets or the total assets logarithm as the explanation variable, the result indicated that the enterprise scale was larger, the debt level was higher. Generally speaking, the enterprise with larger scale has stronger credit, and it is more inclined to diversification strategy or the vertical integration to enhance the effective and disperse the risks, and the enterprise could possess low anticipated bankrupt cost and more debt, and the enterprise scale is larger, it is more easily to obtain the support of the government and the bank credit, so the enterprise scale and the debt ratio present positive correlation.

1.2.3 Influence of growth

The results of the empirical research on the relationship between the growth and the debt ratio can be divided into three sorts. (1) The debt ratio and the company growth showed a negative correlation. Taking the sales growth ratio or the assets growth ratio as the explanation variables, the result indicated that the debt ratio and the growth presented negative correlation. (2) The relation between the debt ratio and the enterprise growth is not significant. Taking the total assets change ratio as the explanation variable, the result indicated that the company growth and the debt ratio presented negative correlation, but the relation was not significant. And taking the primary business incomes in the past three years, the result indicated that the capital structure of the company didn't influenced by the growth. (3) The debt ratio and the company growth showed a positive correlation. Taking the primary business income growth ratio as the explanation variable, the result indicated that the growth speed of the company was quicker, the debt ratio was higher. Generally, most enterprises with high growth are those rising enterprises with shallow base, and they need more capitals, but the examining and approving time of the equity financing is too long, so they have to depend on the debt financing to fulfill the demands of the capital.

1.3 Influence of the company interior governance

Various domestic research results indicated that the intensive favor of equity financing universally existed in Chinese listed companies, which would directly influence the capital structure of the enterprise. Because of the absence of the owner in Chinese listed companies, the insider control occurs and the managers always select the financing mode and arrange the capital structure according to their own wills and value tropism, which makes the listed companies extract shareholders' money by the low costs but don't use these money with high efficiency. On the other hand, because the share price can not reflect the value of the company and the ability and endeavor of the manager layer, the change of the share price can not limit the manager layer which doesn't need to care about the share price falling because of placing.

1.4 Influence of the company exterior system environment

The whole economy of China is in the stage of transformation, and the market mechanism has not been perfected, and the color dominated by the policy is still very dense, and when the share market develops quickly, the enterprise debt market has not been developed correspondingly, which makes against the debt financing for the enterprise. On the other hand, stated majority shareholders' shares can not circulate in the secondary market to acquire the income of the capital, so they don't care about the share price change because of placing. The exterior environment of Chinese listed companies induces the universal equity financing favor and the low debt ratio.

2. Empirical analysis and test

As viewed from the capital demand, the electric power industry belongs to the industry with intensive capitals, and its development needs capital investments from various channels, and the capital structure of the electric power industry directly influences the financing cost and the market value of the company. Since 2003, the electric power shortage in China became more and more severe, and the country begun to strengthen the investment degree to the electric power industry. In 2006, there were 24 provinces pulling brake to be restricted for the electric power in China, and the "electric power shortage" still existed, and in 2007, the electric power supply was still severe, the maximum electric power shortage was about 25 million kilowatt, and the supply and demand conflict in the summer in North China and East China was still severe. So the development task of the electric power industry is still very tough. At present, the increasing capital market in China has offered a good base for the financing demand of the electric power industry, and

the electric power industry only fully utilizes the available resource in the capital market to optimize its own capital structure and enhance the enterprise performance, it can deliver the electric power supply pressure of the whole national economy and quicken the sustainable development of the electric power industry. So, it is very meaningful to study the capital structure of the electric power industry.

2.1 Selection of samples and data source

In the article, we select 25 listed companies in the electric power industry as the example, and the sample period is from 2002 to 2007, and the data mainly root in financial websites.

2.2 Selection of variables

The capital structure means the composing of various capitals and their proportion relationships in the enterprise. The generalized capital structure means the composing of all capitals of the enterprise. And the strict capital structure means the long-term capital structure, and the short-term debt capital is managed as the operation capital. In the article, we mainly study the influences of micro influencing factors on the capital structure, and these micro factors mainly include company scale, profitability, growth, non-debt tax shield, fluidity and assets structure.

2.2.1 Company scale (X1)

The primary business income of the company is used to measure the company scale. Generally, in the balance theory, the company scale increase, the marginal bankruptcy cost decreases progressively, and the company with big scale more easily obtains the debt financing. In addition, the information disclosure of big enterprise is more sufficient, and the asymmetric degree of information is lower, and the anti-risk ability is stronger, and according to the asymmetric information theory, the company with big scale is inclined to debt financing.

2.2.2 Profitability (X2)

The assets profit ratio of the company is used to measure the profitability of the company. According to the sequence financing theory, the enterprise more likes interior financing, and when the exterior financing is imperative under the situation, the company will lean to loan flotation. So under the sequence financing theory, the company should follow the sequence from interior financing to debt financing to equity financing. Therefore, the profitability of the company influences the capital structure.

2.2.3 Growth (X3)

The growth rate of the total assets is used to measure the growth of the company. According to the agent theory, the debt will form certain limitation and supervision for the managers of the enterprise. And according to the sequence financing theory, the industry with high growth always is hard to financing, so the enterprises have to adopt the suboptimal debt financing. Therefore, the growth influences the capital structure.

2.2.4 Non-debt tax shield (X4)

The ratio between the company depreciation amount and the total assets is used to measure the non-debt tax shield of the company. In the model with the tax factor, the non-debt tax shields (such as depreciation, tax loss and delay) can be substitutes of the tax preference of the debt financing, and the company with more non-debt tax shields will possess less debt financing.

2.2.5 Fluidity (X5)

The fluidity ratio (flow assets/ flow debt) is used to measure the fluidity of the company. The high fluidity ratio indicates that the capital turnover speed of the company is quick, and the company can utilize the flow assets to be new investment capitals to reduce the demands of the exterior financing. So the fluidity and capital structure show a negative correlation.

2.2.6 Capital structure (X6)

The value of (fixed assets+ stock-in-trade)/ total assets is used to measure the materiality of the assets and be the substitute variable of the capital structure. The guarantee of material assets can reduce the debt agent cost to certain extent, and according to the agent cost theory, the enterprise with more material assets more easily acquires the debt financing.

2.2.7 Capital structure (Y)

The assets debt ratio is used to measure the capital structure and be the explanation variable.

2.3 Regression test of the model

In the article, we adopt the linear regression model and the EXCEL to analyze and test the data, and the result is seen in Table 1.

Establish the following linear model.

$$Y=0.6699+0.01478*X1-3.2569*X2+0.1828*X3+0.3856*X4-0.1662*X5-0.1242*X6$$

After eliminate the insignificant variables including company scale (X1), non-debt tax shields (X4) and assets structure (X6), the regression result is seen in Table 2.

The residual errors are seen in Figure 1.

Establish the following linear model.

$$Y=0.7761-3.0988*X2+0.2119*X3-0.1571*X5$$

3. Analysis of results

3.1 Company scale, non-debt tax shields and capital structure

The company scale, the non-debt tax shield and the assets structure are not significantly correlative with the capital structure, and the reasons mainly include following aspects.

3.1.1 Companies' behavior emphasizing share but ignoring debt

The imperfection of Chinese securities business makes the sequence financing theory un-adopted in China, so the influences of company scale, non-debt tax shield and assets structure on the capital structure of the company are influenced. At present, the securities business (i.e. the primary market and the placing market which the companies can directly make financing) in China still is a seller's market, so if only the enterprise acquires the listed qualification or the listed company acquires the placing qualification, it can acquire many capitals with low cost. Though part of companies extend the management scale and enhance the profitability by the financed capitals, but there are quit many enterprises which have not the pressure to reward the bonus and distributions, and according to the estimation, the actual cost of the equity financing is about 2.42%, which is far lower than the debt financing cost and makes the factor of non-debt tax shields insignificant. And for the selection of the financing tools, the convertible bond, callable bond and other flexible financing tools have not be utilized effectively, which also induces the behavior emphasizing share but ignoring debt.

3.1.2 Low debt ratio could help the company to establish good management performance

Though the material character of the electric power industrial assets is strong, the proportion of the fixed assets in the total assets is higher, and the profitability of the assets is higher, and comparing with other industries, the electric power enterprise can acquire debt financing by the low debt agent costs, but the practice is not so. Because the electric power industry is influenced by the long-term planned economy, most companies all avoid the debt financing to establish the big status of the electric power industry. The assets guarantee and bonded behaviors of the company must be fully disclosed, which makes the listed company to avoid the debt financing, so the material character of the assets doesn't influence the capital structure of the company significantly.

3.2 Profitability of the company

The profitability of the company and the capital structure shows significant negative correlation, i.e. the profitability is stronger, and the debt ratio is lower. The electric industry is a stable monopolized industry, and it all long possesses better profitability and stable cash flow as the supports, which makes most companies in this industry possess more surpluses and fulfill the capital demands of the company by the interior financing with low costs, and when the interior financing can not fulfill the capital demands, the equity financing, not the debt financing is adopted, so the companies in this industry always has lower debt ratio.

3.3 Fluidity of the capital

The fluidity of the assets is negatively correlative with the capital structure, i.e. the fluidity of the assets is stronger, and the debt ratio is lower. The stable operation of the electric power industry and the stable growth of the primary business make the interior financing of the company possible, and the stock-in-trade of the electric power is few, and the electric power products have not the unmarketable problem, and the fluidity of the assets is strong, which make most companies in the electric power industry can find the capital sources from the flow assets to reduce the demands of the exterior financing. So the fluidity of the assets and the capital structure present negative correlation.

3.4 Growth of the company

The growth of the company is positively correlative with the capital structure, i.e. the growth of the company is stronger, and the debt ratio is higher. The "electric power shortage" in past several years promoted the expansion of the electric power industry, and the capital demands of various companies increased. Up to the late of 2007, the electric installed capacity in China achieved 622 million kilowatt, and increased 20.3% year-on-year. The electricity transmission loop length above 220 kilovolt achieved 281.5 thousand kilometers in China, and increased 10.4% year-on-year, and the power transformation capacity above 220 kilovolt achieved 0.98131 billion kilovolt-ampere, and increased 15.8% year-on-year. In 2006, the generated electrical energy in China achieved 2834.4 billion kilowatt, and increased 13.5%

year-on-year. In 2007, the power consumption of the whole society achieved 2824.8 billion kilowatt, and increased 14.0%, and the amplitude was higher 0.4% than the consumption in 2005. The expansion of the company would induce the growth of the debt financing, but because of the influence of the behavior emphasizing share but ignoring debt, the influence of the growth on the capital structure of the company is significant only when the significant level exceeds 10%, so though the growth is positively correlative with the capital structure, but the correlation is not significant.

Because of the selections of samples and variables, the conclusions may be different to the foregoing research conclusions. In a word, the capital structure of the electric power listed company is influenced by both the interior factors and the exterior factors, and from the micro view, it is mainly influence by the profitability and the fluidity of the assets. To optimize the capital structure of the listed companies in the electric power industry, we should perfect Chinese securities business, strengthen the bond market and stably implement the share-reform from the view of the market, and we should also enhance the profitability of the enterprise and extend the scale of the company reasonably to realize the maximization of the value.

4. Conclusions

The sample period selected in the article is from 2002 to 2007, and the variance of the equity structure because of the share-reform has not be considered completely, and as the limited circulation stocks gradually circulate in the market in future, the change of the equity structure also will influence the capital structure of the company, which can be further studied. In this article, we analyzed the influencing factors only from the micro view, and didn't introduce the macro influencing factors into the model, so the explanations about the influencing factors of the capital structure are not complete. In the future research, various financial factors and non-financial factors of the company can be brought into the strategic environment formed by these factors, and we can study the influences of the company strategy and other sub-strategies such as competition strategy, market strategy, research and development strategy, and human resource strategy on the capital structure, and analyze the factors influencing the capital structure in a wider and more systematic analysis underground. For same company, because of the variance of the strategic factors in different terms, it will adopt different strategies, which will form different capital structures. And because of the similarity of the interior strategic factors and the exterior strategic factors, different companies will adopt same strategy, which will form same capital structure.

References

- Guo, Pengfei & Sun, Peiyuan. (2003). The Industrial Characteristics of Capital Structure: Empirical Research Based on Chinese Listed Company. *Economic Research Journal*, No. 5.
- He, Xiaoqun. (1999). *Modern Statistical Analysis Method and Application*. Beijing: China Renmin University Press. Nov, 1999.
- Lei, Xinghui & Liu, Wancai. (2007). The Strategy Point to the Influential Factors of Capital Structure: A New Vision. *Journal of Lanzhou Commercial College*, No.1.
- Li, Shanmin & Liu, Zhi. (2003). Review on the Facts Affecting Listed Company Capital Structure. *Accounting Research*, No. 8.
- Li, Zinai. (2005). *Econometrics (Second Edition)*. Beijing: Higher Education Press. April.
- Ma, Xiaoying. (2007). Analysis of Chinese Listed Company Capital Structure Actuality and Its Optimization. *Northern Economy*, No.2.
- Sun, He. (2007). Study on the Optimization of the Capital Structure of Listed Company. *Qi Ye Jia Tian Di*, No.2.

Table 1. Data analysis results ($R^2=0.79$, $F=5.01$ (P is 0.00349), $DW=2.601$, significant level is 5%)

	Coefficients	Standard error
Intercept	0.66995075	0.269822
Company scale (X1)	0.014780602	0.020015
Profitability (X2)	-3.256909965	0.719692
Growth (X3)	0.182790846	0.150702
Non-debt tax shields (X4)	0.385641492	1.012695
Fluidity (X5)	-0.166151508	0.072477
Capital structure (X6)	-0.124248989	0.183028
	t Stat	P-value
Intercept	2.482934	0.023113
Company scale (X1)	0.738487	0.469739
Profitability (X2)	-4.52542	0.000262
Growth (X3)	1.212928	0.240836
Non-debt tax shields (X4)	0.380807	0.707803
Fluidity (X5)	-2.29248	0.034143
Capital structure (X6)	-0.67885	0.505866

Table 2. Regression results ($R^2=0.87$, $F=10.72$ (P is 0.0000176), $DW=2.508$, significant level is 5%)

	Coefficients	Standard error
Intercept	0.776057	0.062306
Profitability (X2)	-3.0988	0.574984
Growth (X3)	0.211897	0.123284
Fluidity (X5)	-0.15711	0.052639
	t Stat	P-value
Intercept	12.45556	3.65E-11
Profitability (X2)	-5.38936	2.4E-05
Growth (X3)	1.718767	0.100366
Fluidity (X5)	-2.98465	0.007065

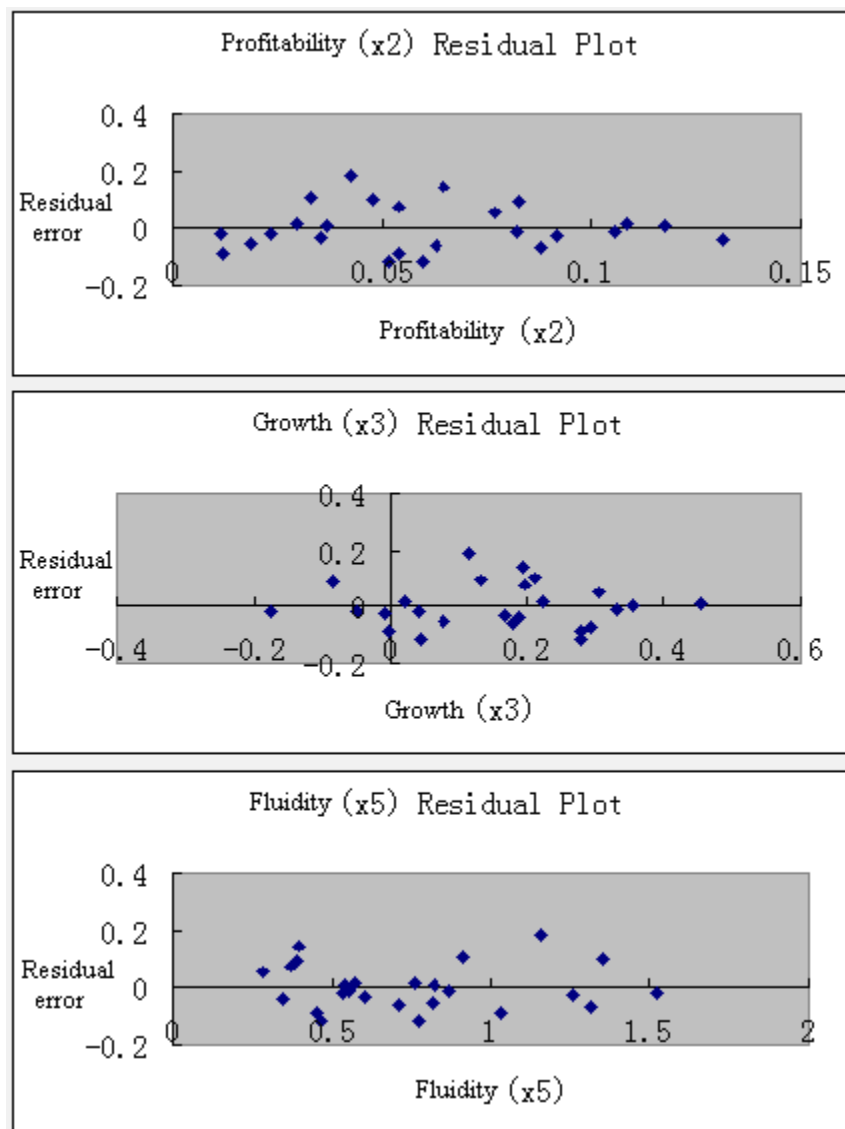


Figure 1. Residual Errors