Research on the Financing of Convertible Bonds in Public Utility Industry: A Case Study of Jiangnan Convertible Bond

Tao Wang[1], Weina Liu[2]

[1,2]School of Economics and Management, XIDIAN University, 266 Xinglong Section of Xifeng Road, Xi'an, Shaanxi 710126, China

Abstract: *With the maturity of China's capital market, the financing tools available are becoming more and more diversified. As an innovative financial instrument, convertible bond has attracted much attention in the market. Based on this, this paper makes a descriptive statistical analysis of 18 convertible bonds of public utilities industry listed on the Shanghai and Shenzhen main board from 2002 to 2018, and takes Jiangnan convertible bond as an example to analyze the financing cost, market response and financial performance. Last, it draws a conclusion and puts forward some suggestions for the financing of convertible bonds, so as to provide reference for the development of Convertible bonds in the future.*

Keywords: Convertible bonds, market effect, financial performance

1. Introduction

Convertible bonds are very popular financial instruments in the international securities market, but they developed relatively late in China. They were developed rapidly after 2001. In February 2017, China issued new rules on refinancing to promote the development of them and usher in large-scale growth of the CB market. Then are all companies fit to issue them?

At present, scholars rarely study the financing of them in the public utility industry, and there are many literature studies on the pricing, announcement effect and clause design of convertible bonds. This paper studies the convertible bonds of the public utility industry in the form of cases, so that people can have a more comprehensive understanding of convertible bonds financing.

2. Literature Review

2.1 Financial Performance of Convertible Bonds

Stein (1992) believed that the issuance of convertible bonds by listed companies could reduce agency costs and thus increase the company's performance. Lewis, Rogalski and Seward(2001) found that the operating performance of the company declined. The research results of Sun Huiling, Xu Lulu and Lin Zhilin (2015) showed that the decline in financial performance and the increase in financial risks after the issuance of convertible bonds by listed companies in China were probably caused by the earnings management behavior of issuing companies before the issuance of convertible bonds.

2.2 Announcement Effect

The study of Smith (1986) believed that the issuance of convertible bonds would have bring negative effects and the stock price would fall by by 2.07% on average. Luo Meijuan et al. (2015) analyzed the announcement effect of convertible bonds issued by listed companies in China from 2010 to 2014

through the event study method, and concluded that the announcement of convertible bonds financing could have a positive impact on the stock price of issuing companies in the short term.

3. Overview of Convertible Bonds in Public Utility Industry

3.1 Listing of Convertible Bonds

The public utility industry refers to the collection of enterprises that provide social and public services for the public. In the narrow sense, the utility industry mainly refers to urban public utilities, including the production and supply of water, electricity and natural gas. This paper adopts this concept. According to the industry classification standards of Shen Wan, 18 public utility convertible bonds issued and listed between January 1, 2002 and December 31, 2018 are still selected. The statistics on its issuance are shown in Figure 1 below.
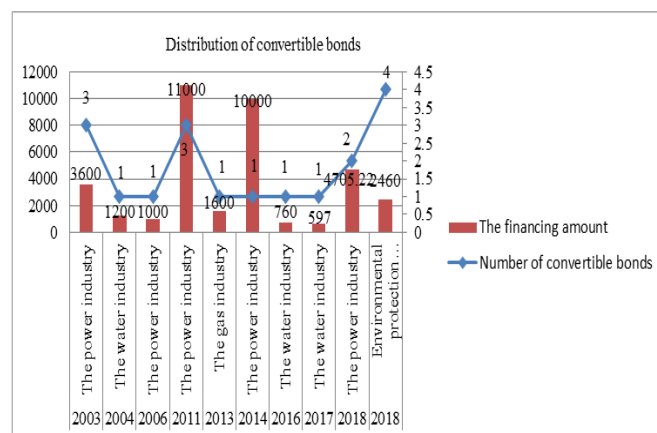

Figure 1: Distribution of convertible bonds in public utilities
In 2011 and before, convertible bonds are mainly power industry. After 2011, the number of convertible bonds issued by the power industry decreased, two convertible bonds are listed in the water industry, and one in the gas industry. In

2018, the issuing subjects are basically environmental protection engineering and service industries.

3.2 The Characteristics of Bonds and Stocks

This paper adopts comprehensive index Delta (Δ) to measure the characteristics of stocks of convertible bond. Dutordoir M and Van DE Gucht L (2004) used the concept of Delta in their research. The interval of Delta is (0, 1). The larger the Delta is, the stronger the characteristic of stocks is. The formula (3-1) is as follows.

$$D=e^{-\delta T}N(d)=e^{-\delta T}N\left[\frac{\ln\left(\frac{S}{X}\right)+(r-\delta+\frac{\sigma^2}{2})T}{\sigma\sqrt{T}}\right] \qquad (3\text{-}1)$$

In formula (3-1), δ refers to the after-tax dividend yield of the issuing company in the previous fiscal year; σ refers to the volatility of stock returns announced between the previous 240 days and the first 40 days; S refers to the price of the convertible bond in the week before the announcement date; X means the initial conversion price of convertible bonds. As for r, it refers to the yield on the five-year Treasury note.

Table 1: Delta (Δ) index

Year of the listed	Name of convertible bond	S/X	r	δ	σ	$\triangle$
2003	Huadian CB	1.05	2.45%	0.01	0.02	0.93
2003	Laurel CB	0.92	2.53%	0.02	0.02	0.17
2003	Guodian CB	1.01	2.53%	0.03	0.04	0.47
2004	Chuangye CB	0.95	4.30%	0.09	0.01	0.04
2006	Shangdian CB	0.93	2.48%	0.05	0.03	0.08
2011	Guotou CB	1.00	3.60%	0.00	0.02	0.98
2011	Chuantou CB	0.96	3.60%	0.00	0.02	0.98
2011	Guodian CB	0.94	3.60%	0.29	0.02	0.01
2013	Shenran CB	1.00	4.13%	0.01	0.02	0.92
2016	Jiangnan CB	0.86	2.58%	0.01	0.07	0.39
2017	Guozhen CB	1.00	3.73%	0.00	0.02	0.97
2018	Mengdian CB	0.98	3.81%	0.02	0.01	0.89
2018	Dilong CB	0.98	3.81%	0.00	0.03	0.98
2018	Boshi CB	0.98	3.30%	0.00	0.03	0.98
2018	Gaoneng CB	0.99	3.30%	0.00	0.05	0.9
2018	Funeng CB	0.99	3.29%	0.03	0.02	0.62
2018	Weiming CB	0.98	2.39%	0.01	0.02	0.83

Due to the late launch time of Zhejiang CB, it is impossible to calculate delta, so it will be excluded. The average Delta is 0.6566 and the median is 0.8885. Chinese utility industry CB is more inclined to equity. (Table 1)

Burcalu (2000) divided convertible bonds into three groups according to the size of Delta, among which [0, 0.33] was the debt-oriented group, [0.33, 0.66] was the mixed group, and [0.66, 1] was the equity group. According to this standard, there are three hybrid convertible bonds, namely Funeng CB, Jiangnan CB and Guodian CB listed in 2003.

4. Problem Definition

This paper finds that Jiangnan CB presents the characteristics of mixed type, while the conversion rate of Jiangnan CB to the later stage is extremely small. Then in the case study, we mainly analyze the impact of convertible bond financing on Jiangnan.

5. Methodology

This paper adopts case analysis method. In the case study, the index calculation and case comparison are carried out for the problems raised, and the regression model is derived by SPSS in the event study method of the case.

6. Results and Discussion

6.1 Objective

On March 18, 2016, Jiangnan issued 760 million yuan of convertible bond. The coupon interest rate was 0.3%, 0.5%, 1.0%, 1.5%, 1.8% and 2.0% respectively. The corporate income tax rate was 25%. Jiangnan CB went through 5 times of selling back during the third interest calculation period, and the amount of it was 757,965,200 RMB. By February 13, 2019, a total of 242,251,171.84 RMB had been paid for redemption. The transaction fee ratio of Jiangnan CB was 2.84%, and the survival time was 2.91 years.

6.2 Analysis of financing cost

In the first two years of interest-bearing period, the conversion value of Jiangnan CB was 73,218 RMB and 23,373 RMB respectively. In the 2.91 year, the conversion value was 16,229 RMB. The formula for calculating the financing cost is as follows.

$$CO_t = FV \times I_t \times (1-T), \ (1 \le t < n) \qquad (6\text{-}1)$$
$$CO_t = FV \times (1+I_t) \times (1-T), \ (t=n) \qquad (6\text{-}2)$$
$$\sum_{t=1}^{n} \frac{CO_t}{(1+i)^t} = FV \times (1-h) \qquad (6\text{-}3)$$

In these formulas, FV means the face value of CB; h refers to the transaction fee ratio; It refers to the coupon rate; T refers to the income tax rate, and i means the capital cost.

After the above data is substituted into the above formula, the cash flow of each period is shown in the following table 2 and formula (6-4).

Table 2: Cash flow of Jiangnan convertible bond

t	I	Calculation process	COt
1	0.30%	76000×0.30%×0.75+7.3218	1,783,218 RMB
2	0.50%	76000×0.50%×0.75+0.2373	2,852,373 RMB
2.91	1.00%	76000×1.00%×0.75×0.91+1.6229+2425.1172+75796.052	787,414,921 RMB

$$\frac{178.3218}{(1+i)}+\frac{285.2373}{(1+i)^2}+\frac{78741.4921}{(1+i)^{2.91}}=76000\times(1-2.84\%) \quad (6\text{-}4)$$

The financing cost of Jiangnan CB is 2.45%. Similarly, the financing costs of Chuangye CB and Shenran CB are 12.48%

and 16.98% respectively. The buyback ratio of Jiangnan CB is as high as 96.83%, and the conversion ratio is only 0.01%. Although Chuangye CB is also sold back, the conversion ratio is 99.90%. Therefore, its conversion will enable the holder to obtain premium income from the stock and greatly increase the financing cost. As for Shenran CB, its conversion rate is 99.79%. In the long run, convertible bonds and shares reduce the company's long-term debt repayment pressure and achieve the purpose of financing. In the long run, the conversion of convertible bonds reduces their long-term debt repayment pressure and achieves the purpose of financing.

6.3 Analysis of the market reaction

In this paper, the event study method is used to analyze the market response of CB issuance in a short period of time, and estimate the AR and CAR within the period of the event, so as to analyze the impact on the company's value. AR represents the difference between actual and expected returns, while CAR represents the accumulated AR.

On March 16, 2016, Jiangnan released the issuance announcement of CB, so this paper records March 16, 2016 as the event date (T=0), set the value range of event window as (-10, 10), and set the estimation window as (-130, -11).

The market model is used to calculate the expected normal rate of return. The specific formula is as follows.

$$R_h = \alpha \times R_m + \beta \qquad (6\text{-}5)$$

In the formula, Rh is the return rate of the stock, while Rm is the rise and fall of the Shanghai or Shenzhen Composite Index.

By using SPSS software, it is concluded that the regression model during the estimation period of Jiangnan is as follows, and R squared =0.3877.

$$R_h = 0.002398 + 1.040391 R_m \qquad (6\text{-}6)$$
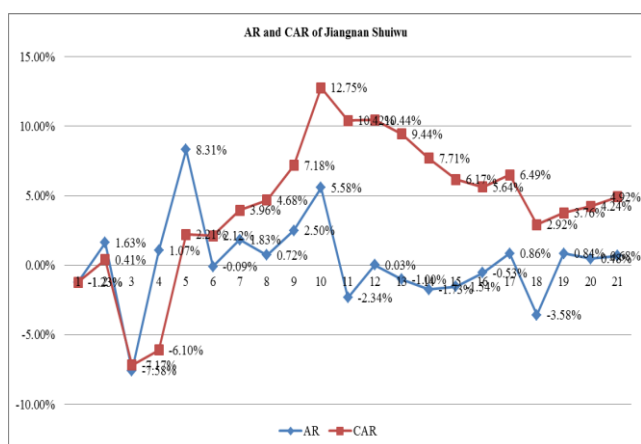

Figure 2: AR and CAR of Jiangnan Shuiwu

During (-10, -1), AR reaches the maximum and minimum value of the window period, and the fluctuation degree is relatively large. However, CAR is basically positive and showed an obvious upward trend. When T=-1, CAR reaches the peak of 12.75%. When T=0, AR decreases by a large margin and becomes negative, after which AR fluctuated by a small amplitude. In addition, CAR also decreases significantly during (0, 7), but the value of CAR is still positive. It can be

seen that although the issuance of CB by Jiangnan brought positive excess returns, the overall CAR fluctuates greatly in the later period. (Figure 2)
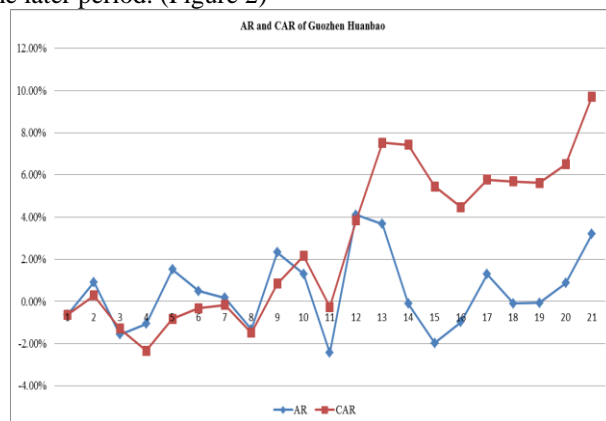

Figure 3: AR and CAR of Guozhen Huanbao

It can be seen from figure 3 that the market effect of Jiangnan is poor. In figure 2, CAR and AR are in a rising trend of fluctuation. This shows that Guozhen's issuance of CB has a positive impact on its share price. Compared with Jiangnan, the majority of investors are more optimistic about Guozhen Huanbao.

6.4 Analysis of financial Performance

Financial performance indicators include profitability indicators, solvency indicators, growth capacity indicators and cash flow indicators. In this paper, the representative financial indicators are selected. We use accounts receivable turnover, current asset turnover to measure operating capacity; current ratio, quick ratio to measure solvency; ROE, ROA, EPS to measure profitability; OIGR, NAGR is used to measure growth capacity; OCFPS is used to measure cash flow. The performance of Jiangnan is as follows.

Table 3: Financial performance comparison

Financial index	The difference between the previous year and the year of issue	The difference between the year of issue and the second year
Current ratio	0.82	-0.26
quick ratio	0.88	-0.21
receivable turnover	-27.69	-16.86
current asset turnover	0.04	-0.07
ROE	0.84%	-4.40%
ROA	0.69%	-3.67%
EPS	-0.23	-0.09
OCFPS	6.00%	50.42%
NAGR	4.59%	-9.70%
OIGR	15.12%	-29.85%

Generally speaking, most of the financial indicators after the issuance of Jiangnan CB are in a state of decline, and the financial indicators that picked up in the year of issuance shows a sharp decline in the second year of issuance, indicating that the issuance of convertible bond brings a short-term increase in the financial capacity of Jiangnan, but this increase is not sustainable. In the short term, the financing of CB doesn't improve Jiangnan's performance.

7. Conclusion

The public utility industry tends to issue equity convertible bonds, but there are also hybrid convertible bonds such as Jiangnan CB. The company doesn't clearly express its intention to issue CB when designing the terms of it, and the final conversion ratio is especially low. Although the financing cost is relatively low, the amount of concentrated resale in Jiangnan is relatively large, which will bear great financial pressure in the later stage. In addition, the company's market effect and financial performance are not good, so Jiangnan is not very successful in issuing convertible bond.

8. Suggestions

First, when making financing decisions, enterprises need to consider factors such as economic environment, financial situation, industry development, financing cost and strategic objectives, so as to choose the most suitable financing tools for enterprises. When choosing financing instruments, enterprises should not take convertible bonds as substitutes for equity financing instruments, but should pay attention to whether convertible bonds are applicable to enterprises.

Second, when the company determines the conversion price, it needs to consider various factors comprehensively. The transfer price of Jiangnan is set high, it is difficult to meet the transfer conditions, resulting in the failure of the transfer.

Last, China should strengthen the tracking and investigation of the capital flow and use of enterprises after convertible bond financing, so as to effectively promote the improvement of corporate performance and corporate value.

References

[1] Stein Jeremy C. Convertible Bonds as Backdoor Equity Financing [J].Journal of Financial Economics, 1992, 32(1).
[2] Craig M Lewis, Richard J Rogalski, James K Seward. The Long-run Performance of Firms that Issue Convertible Debt: An Empirical Analysis of Operating Characteristics and Analyst Forecasts [J].Journal of Corporate Finance, 2001(4): 447-474.
[3] Masahiko E. A Game Options Approach to the Investment Problem with Convertible Debt Financing [J].Journal of Economic Dynamics & Control, 2010(34):1456-1470.
[4] Huiling Sun, Lulu Xu, Zhilin Lin. A Study on the Business Performance of Listed Companies after Issuing Convertible Bonds [J]. Enterprise Economic.2015.
[5] Guo Li. Motivation and Consequences of Issuing Convertible Bonds by Listed Companies in China [J]. Modern Enterprise, 2016(7):30-35.

Volume 8 Issue 9, September 2019
www.ijsr.net
Licensed Under Creative Commons Attribution CC BY
Paper ID: 23091903   10.21275/23091903   1384