Case study on green bond financing of company B

Yi Ding

School of Economics and Management, Nanjing University of Science and Technology, Nanjing, China

*Corresponding author: dingyi@njust.edu.cn

Abstract. With the development of the new energy vehicle industry, exploring market-oriented financing channels has become an important task for the new energy vehicle industry. Green bonds not only have low-carbon green attributes, but also have strong economic benefits. This paper selects two phases of green bonds issued by company B as the research object, explores the necessity of its issuance, and analyzes the issuance process and financing effect of green bonds. The study found that the green bond financing of company B can reduce the financing cost, improve the financing cashing ability and improve the financing efficiency. Secondly, green bonds have good positive feedback from the market, which optimizes the Green Governance of the company and improves the ESG performance of the enterprise.

Keywords: Green bonds, New energy vehicles, Financing effect.

1. Introduction

The promotion and development of the low-carbon economic model needs the support of relevant financial policies. As an innovative financing tool, green bonds have obvious advantages of financing interest rate and good reputation, and play an important role in the green transformation of the financial market. The new energy vehicle industry is an important industry for the country to deal with climate issues and help green development. After the termination of the subsidy policy for the purchase of new energy vehicles, new energy vehicle enterprises need to expand financing channels and increase financing scale. Green finance can provide new channels for the new energy vehicle industry. However, few domestic new energy vehicle enterprises have issued green bonds. Company B is the first enterprise in the new energy vehicle industry to issue green bonds. Analyzing its green bond financing is of great significance to explore a new and low-cost financing mode for the new energy vehicle industry and promote the green transformation and upgrading of enterprises.

Green bond financing has obvious cost advantages. The study of Zerbib (2018) [1] found that green bonds have lower issuance costs, tax costs and information disclosure costs than other financing methods. Karpf and Mandel (2018) [2] found that the average interest rate of green bonds is lower than that of traditional bonds by studying the US government bond market. As for the financing effect of green bonds, from the perspective of stock price, Baulkaran (2019) [3] found that the stock market responded positively to the issuance of green bonds, and the cumulative excess return rate of green bonds issued by enterprises was significantly positive, indicating that the issuance of green bonds was conducive to improving the value of shareholders. Flammer (2021) [4] further study found that when the green bonds issued are certified by a third party, the environmental importance score of the industry in which the enterprise is located is high, or the initial public offering, it will bring higher cumulative excess returns. Tang and Zhang (2020) [5] found that the stock market gave a positive response to the initial issuance of green bonds, but did not produce a significant positive response to the subsequent re issuance of green bonds. In terms of financial and social effects, Baste and Sanchez (2019) [6] believe that the issuance of green bonds can make the capital structure of enterprises more reasonable to a certain extent, so as to relieve the debt paying pressure of enterprises. Lin et al. (2024) [7] used the three-stage data envelopment model to study and found that issuing green bonds can significantly improve the financing efficiency of enterprises. The mechanism is that green bond financing affects the recognition of investors and financing costs, thus promoting the green transformation of enterprises. Khan and Vismara (2025) [8] used the mate analysis method to

synthesize the estimation of environmental results and financial results and found that the impact of green bonds on financial performance was inconsistent and significant, but had a significant positive impact on environmental performance. After reading the existing literature, it is found that green bonds have significant advantages in financing cost, but there is a lack of specific research on new energy vehicle industry enterprises. The research on the financing effect of green bonds is relatively scattered, and there is no comprehensive analysis on the effects of various aspects after the issuance of green bonds. This paper will make an in-depth analysis of the case of green bond financing of company B.

2. Case study on green bond financing of company B

Company B was established in Guangzhou and Shenzhen in 1995, and listed on the SME Board of Shenzhen Stock Exchange in 2011. At present, it has built a diversified new energy ecosystem, covering four sectors: automobile, rail transit, electronics and photovoltaic energy storage. In 2024, company B's business revenue reached 777.112 billion yuan, its net profit reached 41.59 billion yuan, and the share of passenger cars in the domestic market reached 65.2%. As a scientific and technological innovation enterprise, company B attaches importance to R&D, and becomes the leader of the industry by taking advantage of national policies and first mover advantages, with broad development prospects.

2.1. Issuance of green bonds of company B

Company B completed the bookkeeping and filing issuance of the first phase of green bonds in 2018 on December 18, 2018, and completed the bookkeeping and filing issuance of the first phase of green bonds in 2019 on June 17, 2019. The amount of issuance was 1billion yuan, the coupon rate was 4.98% and 4.86% respectively, and the term was five years. At the end of the third interest bearing year of the bonds, the issuer's option to adjust the coupon rate and the investor's option to sell back were attached. The purpose of the raised funds of the two phases of green bonds issued by company B is shown in Table 1.

Table 1. Purpose of raised funds from green bonds of company B (million yuan)

Name of bond	Used raised amount	Purpose of raised funds
18 Green Bond 01	250	Qinghai lithium iron phosphate construction project
	80	Shanwei battery pole piece production line expansion project
	170	Wuhan new energy bus parts manufacturing project
	500	Replenish working capital
19 Green Bond 02	70	Baotou energy power battery production project
	150	Taiyuan power battery (4.5GWh) assembly project
	280	Xi'an power battery (10GWh) production project
	500	Replenish working capital

2.2. Analysis on the necessity of green bond financing for company B

Before the issuance of green bonds, the financing of company B was divided into six modules: internal financing, bank loans, corporate bonds, equity financing, government subsidies and ultra short-term financing bonds. The analysis of its financing structure found that company B had the problems of short-term debt and long-term investment and excessive dependence on government subsidies. As shown in Table 2, before the issuance of green bonds, the proportion of short-term borrowings of company B has been close to 85% of the total bank borrowings, and it will not decline until 2019. Short term borrowings are generally used to meet the daily business needs of enterprises,

reflecting the problems of unbalanced debt ratio and short-term debt and long-term investment in company B.

Table 2. Short term and long term borrowings of company B (10 thousand yuan)

Year	2015	2016	2017	2018
Short term borrowing	1,994,380	2,500,961	3,577,492	3,778,898
Proportion	74.70%	73.80%	84.90%	84.70%
Long term borrowings	675,596	484,794	636,924	684,760
Proportion	25.30%	16.20%	15.10%	15.30%

The net profit of company B largely benefits from government subsidies. In the three years before the issuance of green bonds, the proportion of financial subsidies in the net profit has increased year by year. Under this background, the decline of subsidies will bring greater pressure on the company's financing.

Table 3. Government subsidies received by company B before issuing green bonds

Year	Amount of financial subsidies (100 million)	Proportion in net profit
2015	5.81	18.5%
2016	7.11	12.9%
2017	12.76	26.0%
2018	20.72	68.0%

Excessive reliance on government subsidies for operational turnover is the biggest problem for the whole new energy vehicle industry. As an important part of company B's net profit, government subsidies have been rising in the proportion of net profit from 2015 to 2018. The decline of subsidies and the company's expansion strategy have changed in the opposite direction, and company B's cash flow is further under pressure. In this context, company B urgently needs to expand financing channels, optimize the current financing structure, and strive to match the long-term investment in R&D with long-term debt. Therefore, it is necessary for company B to seek solutions from green bonds.

2.3. Analysis on the financing effect of B company's green bonds

2.3.1 Market effect analysis

The two phases of green bonds of company B were announced to be issued on November 23, 2018 and June 17, 2019 respectively. The market model with a window period of [-10, 10] was used to analyze the market effect using the event study method. As shown in Figure 1, the cumulative excess return showed an obvious upward fluctuation trend, with a maximum of 15.68%, indicating that the issuance of green bonds had a positive impact on the share price of company B, making investors pay more attention to the development of company B. For company B, which is trying green bond financing for the first time, it has not only attracted more investors' attention at present, but also laid a foundation for the normalization of green bond financing in the future.

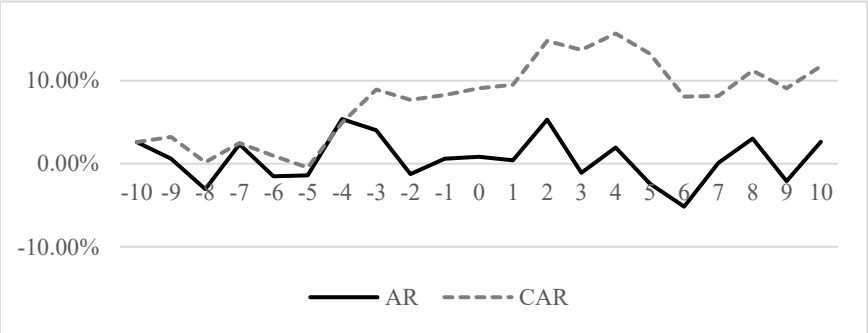

Fig. 1 18 Green Bond 01 market effect chart

However, the excess return rate of 19 Green Bond 01 event day fluctuated slightly around 0, and the cumulative excess return rate did not show an obvious upward trend. It fluctuated slightly around 5%. The time interval between the issuance of two phases of green bonds of company B was short, and the market had enough expectations for the financing of green bonds of company B, and the share price was difficult to peak again.

2.3.2 Financial effect analysis

Firstly, reduce financing costs. For bond financing, the interest rate accounts for the largest proportion in the financing cost. The interest rates of the two phases of green bonds of company B are 4.98% and 4.86% respectively, while the maximum interest rate of ordinary green bonds other than green bonds can reach 6.35%. The interest rate of ordinary bonds fluctuates greatly. By using the weighted average method and taking the issuance scale as the weight, the weighted average bond interest rate for reference is calculated to be 5.17%, and the interest rate difference between the two issues of green bonds is 19bps and 31bps respectively. However, the green bonds have the option to adjust the coupon rate. The coupon rates of the two adjusted green bonds are 2.50% and 2.00% respectively, which makes the green bonds have obvious financing cost advantages in terms of interest rate.

Table 4. Bond financing of company B by the end of 2019 (100 million)

Name	Value date	Year	Total issuance	Rate (%)
11 Company 01	2012/9/23	6	30	6.35
15 Company 01	2015/8/12	3	15	4.1
16 Company MTN001	2016/2/25	5	2	5.1
16 Company MTN002	2016/2/29	5	4	5.1
17 Company 01	2017/6/15	5	15	4.87
18 Company 01	2018/4/12	5	30	5.17
18 Company 02	2018/8/22	4	16	5.75
18 Green Bond 01	**2018/12/21**	5（3+2）	**10**	**4.98**
19 Company 01	2019/2/22	5	25	4.6
19 Green Bond 01	**2019/6/14**	5（3+2）	**10**	**4.86**
19 Company 03	2019/8/9	5	25	4.8

In addition to the interest rate, the issuance of bonds also needs to bear the issuance cost. The issuance cost of green bonds is higher due to the increased certification and evaluation of green attributes. At present, China's policy does not require the issuer to complete the third-party certification, but the regulatory authorities require enterprises to regularly report the capital flow and information data of green projects during the duration of green bonds. In general, green bond issuance has cost advantages over ordinary bonds, but it also needs to bear the necessary internal evaluation costs.

Secondly, improve the financing cashing capacity. From the perspective of short-term financing cashing capacity, the current ratio of the new energy vehicle manufacturing industry reached 3.1 in 2016, and then gradually fell back to normal in the next two years. The data of company B is slightly lower than the average level of the industry, and enterprises still need to pay close attention to the short-term debt repayment risk of enterprises. After the issuance of green bonds, the liquidity ratio of company B has improved slightly, and the financing cashing ability of enterprises has improved. In the long run, from 2016 to 2021, the change of company B's asset liability ratio is almost consistent with the fluctuation of the industry, and its asset liability ratio is slightly higher than the industry average. In a word, company B has great debt paying pressure, but the fluctuation is small. The change is the same as the overall performance of the industry. The cashing ability is OK. Issuing green bonds has a certain effect on improving the short-term debt paying ability, but the long-term effect is very small. The necessity of issuing green bonds has been further verified.

Table 5. Financing cashing capacity of company B before and after green bond financing

Project	2016	2017	2018	2019	2020	2021
Industry average	3.103	2.151	1.149	1.384	1.229	1.165
Current ratio of B	1.016	0.992	1.004	1.007	1.068	0.970
Industry average	61.567	66.105	68.371	67.183	67.456	64.687
Asset liability ratio of B	61.805	66.335	68.806	68.002	67.936	64.756

Thirdly, improve financing efficiency. Data Envelopment Analysis (DEA) can analyze the efficiency of fund raising and allocation in financing problems. In order to evaluate the financing efficiency of the two phases of green bonds issued by company B, Zou et al. (2008) [9] were used as input indicators to express the cost of debt financing. Two indicators, the growth rate of net cash flow after financing and the interest rate of green bond issuance, were selected to measure the debt repayment risk after borrowing; In terms of output indicators, the growth rate of operating income, the return on net assets and the turnover rate of total assets are selected to reflect the allocation of funds after financing from three aspects: the development ability, profitability and operating ability of the enterprise. Take the green bonds issued at the same time as the green bonds of company B as the sample for analysis. All the output and input indicators of DEA method are positive, and the dimensionless method is adopted to map the negative indicators to the positive range. In this paper, dea-bcc and dea-ccr models are used for data envelopment analysis, and the evaluation focuses on TE (technical efficiency), PTE (pure technical efficiency), SE (scale efficiency) and RTS (return to scale) of each DMU. When the efficiency value is 1, it indicates that the efficiency has reached the effective state, there is no input redundancy and insufficient output, and when the efficiency value is less than 1, it indicates that it is not fully effective, so the enterprise needs to adjust the output input value.

Table 6. DEA results of two phases of green bonds of company B

Project	Name	Efficiency value	Mean	Difference	Rank
TE	18 Green Bond 01	0.839	0.637	0.202	4
	19 Green Bond 01	0.492	0.637	-0.145	9
PTE	18 Green Bond 01	0.859	0.854	0.005	7
	19 Green Bond 01	0.771	0.854	-0.083	9
SE	18 Green Bond 01	0.977	0.719	0.258	3
	19 Green Bond 01	0.638	0.719	-0.081	10

Comprehensive technical efficiency is to evaluate the integrity of DMU production efficiency and reflect the capital allocation efficiency of enterprises. It can be seen from table 6 that the comprehensive technical efficiency of the first phase of green bonds issued by company B in 2018 ranked high in all samples, higher than the average of the samples, while the comprehensive technical efficiency of the green bonds issued in 2019 declined. From the performance of pure technical efficiency and scale efficiency, the high comprehensive technical performance of the first phase of green bonds issued by company B in 2018 mainly comes from the scale efficiency of green bond financing, that is, green bond financing timely matches the company's capital gap, replenishes working capital, and supports the implementation of the company's strategy. The pure technical efficiency of the two green bonds remained at a relatively stable level, indicating that the capital management ability of the enterprise remained stable and maintained at an average level in multiple green bond financing samples. It can be seen that the key to improving the financing efficiency of company B's two green bond financing is the matching of financing scale. When there is a capital gap, the enterprise will immediately carry out targeted financing, timely supplement working capital, and support the implementation of the company's strategy, which will show high financing efficiency.

2.3.3 Social effect analysis

Issuing green bonds will attract investors' attention to the issuer in the field of green sustainability, make the issuer pay attention to its own environmental protection posture, and promote the Green Governance of enterprises. Social effects include environmental effects and reputation effects. The social responsibility report of company B disclosed the energy conservation and emission reduction effects achieved by two green bonds. Company B has made many efforts to reduce its energy consumption and pollution, including the promotion of energy audit projects and internal audit projects, as well as the low nitrogen transformation of boilers in Beijing, Taiyuan, Xi'an and other places. Wind ESG rated company B as a dark green enterprise, as shown in Table 7. After the issuance of 18 Green Bond 01 and 19 Green Bond 01, the comprehensive ESG score of company B reached 8.55, significantly better than that in 2021 and 2022. The comprehensive score of its management practice is 5.62, indicating that the issuance of green bonds not only improves the operation and management of enterprises in terms of financing, but also plays a significant positive role in corporate governance and green project R&D innovation.

Table 7. Wind ESG rating of company B from 2020 to 2022

Project	2020	2021	2022
ESG comprehensive	8.55	7.60	7.93
Management practice	5.62	4.98	5.31
Disputed events	2.92	2.63	2.62

In terms of reputation effect, the issuance of green bonds by company B highlighted its green qualification and created a good social image. On the one hand, company B took the lead in issuing green bonds and actively responded to the "market led" industrial policy of the new energy vehicle industry, which not only promoted the solution of the capital demand for green projects, but also explored diversified financing channels for other new energy vehicle enterprises. On the other hand, green bonds can help company B get good positive feedback. The company will raise funds to promote the development and utilization of new energy technologies, promote the production of power batteries, and effectively achieve energy conservation and emission reduction. It not only improves the utilization rate of social capital, but also meets the dual requirements of investors for economy and green. In recent years, company B has made various achievements in the field of power batteries, new energy and enterprise innovation, and has been widely recognized at the social level.

3. Summary

This paper analyzes the case of green bond financing of company B and finds that green bond financing has its cost advantage, which is more significant under the support of policies; As a medium and long-term financing method, green bonds can optimize the financing structure, which is conducive to the long-term development of enterprises. Issued under appropriate conditions, green bond financing has better financing efficiency, can promote green governance of enterprises, enhance the reputation of enterprises, and also has better performance in the short-term market effect. The issuance of green bonds can enhance the sustainable environmental protection degree of issuers, and promote enterprises to pay attention to energy conservation and emission reduction in production and operation. It has a significant positive effect on enterprises to fulfill social responsibility, improve ESG performance and enhance corporate image.

In the process of analysis, it can also be found that the current green bond financing is insufficient. Enterprises should give full play to the advantages of green bond policy and strictly control the cost of green bond issuance. The government should strengthen supervision and evaluation, cooperate with industrial policies, and ensure the harmonious and healthy development of the green bond market.

Issuing green bonds is company B's deep insight into industrial policies. Issuing green bonds is the first step of market-oriented financing taken by company B on behalf of new energy vehicle

enterprises. From this perspective, issuing green bonds has far-reaching significance beyond the creation of individual profits and getting out of financing difficulties.

References

[1] Zerbib D O. The Effect of Pro-environmental Preferences on Bond Prices: Evidence from Green Bonds[J]. Journal of Banking and Finance, 2018, 42(01): 39-60.

[2] Karpf A, Mandel A, Battiston S. Price and Network Dynamics in the European Carbon Market[J]. Journal of Economic Behavior and Organization, 2018, 39(09): 103-122.

[3] Baulkaran V. Stock Market Reaction to Green Bond Issuance. [J]. Journal of Asset Management, 2019, 20(5): 331-340.

[4] Flammer C. Corporate Green Bonds[J]. Journal of Financial Economics, 2021, 142(2): 499-516.

[5] Tang D Y, Zhang Y. Do Shareholders Benefit from Green Bonds?[J]. Journal of Corporate Finance, 2020, 27(2): 1-15.

[6] Basten M, Serrano S A. European Banks After the Global Financial Crisis: A New Landscape[J]. Journal of Banking Regulation, 2019, 20(1): 51-73.

[7] Lin R, Ma G, Cao J. Do Green Bonds Help to Improve Enterprises' Financing Efficiency? Empirical Evidence Based on Chinese A-Share Listed Enterprises[J]. Sustainability, 2024, 16(17): 7472-7472.

[8] Khan A M, Vismara S. Green Bond Issuance and Corporate Environmental and Financial Performance: A Meta-analysis[J]. International Review of Economics and Finance, 2025, 35(2): 104313-104313.

[9] Zou H, Adams B M.Debt Capacity, Cost of Debt, and Corporate Insurance[J]. Journal of Financial and Quantitative Analysis, 2008, 43(2): 433-466.