World Academics Journal of Management **Research Paper**
Vol.8, Issue.3, pp.25-30, September (2020) **E-ISSN:** 2321-905X

Is Voluntary Third-party Certification Worth It for Corporate Green Bond Issue? –An Investigation of Chinese Green Bond Market

Shaoqian Xu[1], Hao Wu[2], Nan Zhang[3]

[1,2]Faculty of Economics, Thammasat University, Bangkok, 10200, Thailand
[3]School of Politics and Law, Tibet University, Lhasa, Tibet, 850000, China

[*]*Corresponding Author: xushaoqian90@gmail.com, Tel.: +66-0834206156*

Available online at: www.isroset.org

Received: 24/Aug/2020, Accepted: 15/Sept/2020, Online: 30/Sept/2020

***Abstract*—**The Chinese companies may hire a third-party agency in order to assess whether the project implemented "green" or not, when planning to issue the corporate green bond, voluntarily. Previously, the literature on third-party certification of corporate green bonds in China was mostly qualitative analysis with few empirical analysis, this article employed China's corporate green bonds as a sample to examine the impact of third-party certification on the issuance costs of corporate green bonds. Even though it is not mandatory in the bond issuance process, as an extra cost on certification, we found that the certification can enhance the credibility of corporate green bonds and attract more responsible investors, in details, after controlling other influential factors, the issuance cost of a corporate green bond with a third party certification was significantly reduced; however, for a corporate green bond with lower credit rating, the third-party certification cannot function as a credit endorsement and reduce its issuance cost. Furthermore, it is worth noting that there are still some problems in the corporate green bond evaluation and certification business, in terms of agency management, quality of certification reports, and comparability of certification conclusions. And the relevant parties may take some measures to solve the existing problems.

Keywords—Voluntary, Third-party Certification, Issue Cost, Corporate Green Bond, Green Bond Market, China

I. INTRODUCTION

In China, the world's most polluted nation is making a bid to become the global leader in green finance. Since the Chinese government promoted its ambitious policy on green bonds issuance from 2016, China has issued more than $ 30 billion worth of green funds in 2018, making China the second-largest global green-fund issuing nation after the United States. The green bond market is likely to continue to grow over the next decade.

Be that as it may, green bonds are as yet another financing apparatus used to raise assets through the capital market and put the returns in green tasks, for example, vitality preservation, ecological assurance, nature and atmosphere. Before 2016, the total number of corporate green bonds issued in China was small, accounting for a small amount of global issuance. While in 2018, the issuance of corporate green bonds in China showed a blowout growth. At the same time, the voluntary third-party certification of a domestic corporate green bond has also been supported by relevant departments. The number of assessment agencies has continued to increase, and many assessment agencies have formed their own green bond certification methods. However, there are still some shortcomings as a whole, which needs to be further refined and improved. Green bonds certified by the third party will be labeled with green label, which will greatly enhance the credibility of green bonds. Then, will the issue cost of green bonds be affected by the third-party certification?

II. LITERATURE REVIEW

2.1 Green Bond Issuance

Since EIB (European Investment Bank) and World Bank gave first green mindfulness bonds in 2007 and the Climate Bond Initiative propelled the Climate Bond Standard and Certification Scheme in 2010, the green bonds have been a typical concern issue in the green fund field. The green bond with a characterized utilization of continues towards low-carbon or ecological well-disposed exercises, and it is one of the significant examples of overcoming adversity regarding budgetary development supporting green account streams as of late.

Hong (2017) mentioned that green bond is a special financial tool that can help the government use public financial means to introduce idle funds from the society into green industries, which can achieve the goals of industrial policies and public policies and promote the sustainable development of the economy and the transformation of economic structure. Coincidentally, Zhang and Shen (2018) thought about that green bonds allude to security instruments that utilization supports raised when giving bonds, for explicit purposes, or to renegotiate green tasks. Contrasted and normal bonds,

green bonds are more focused in the utilization of security assets and guide assets to put resources into green enterprises [1] - [7].

2.2 Voluntary Third-party Certification of Green Bonds in China

As far as the green bond issuance, the enormous issue is: in what capacity can corporate green bond guarantors make their "green" attributes of the bond solid and influential to financial specialists?

Wang and Cao (2016) tracked that a common international practice for this is that corporate green bond issuers hire independent professional assessment agencies to evaluate the bonds and obtain a so-called "second opinion" or " third-party certification." In details, through professional assessment methods and processes, the assessment agency would conduct a professional assessment and certification regarding to the terms as follows: usage of raised funds, project screening and evaluation, fund tracking management and project operation, environmental sustainability assessment and so on, in this manner upgrading the straightforwardness of corporate green bond data revelation and pulling in more financial specialists.

In the Chinese case, Ge (2018) considered that third-party certification has been valued and recognized in both relevant policies and the actual issuance process of green bonds. Huang (2019) employed an OLS method and found that in China, the affirmation can upgrade the believability of corporate green bonds and attract more responsible investors. In Chu's (2019) master's degree thesis, he also wrote that in China, the 3rd party certification can significantly lower the green bonds insurance price [8] - [22].

In 2019, cooperated with China Energy Conservation Consulting, the China Bond Valuation Center compiled and launched the first Chinese green bond classification label. For bonds issued and raised in green fields or green industry, that is, the bonds that will be used to raise funds to be used in sustainable development related industries, are all identified as substantial green bonds.

So, does the existence of third-party certification reduce the cost of green bonds? Different scholars have different views. This paper will use data from the China Green bond database to analyze the impact of third-party certification on the issuance cost of green bonds.

III. METHODOLOGY

3.1 Sample

The following research will take all corporate green bonds issued by Chinese enterprises as the research objects from 2016-2019. This article selects 138 corporate green bonds issued by China as of the end of 2019 as the original sample.

Through manual screening, this paper finally obtained a total of 138 observations that were issued by the companies. We collect the securities code for each company, verified or not, the coupon rate, issuance date, bond maturity, bond rating, and risk-free interest rate (hereby, treasury bond yields within the same issuance date, same maturity of the 138 green corporate bonds.) as well as quarterly GDP growth rate, CPI index, SHIBOR index.

The data used in this study are from the China Green Bond Database, and East Money Website. Besides, in the regression analysis, in order to eliminate the influence of extreme values, in this paper, we also performed a 1% Winsorize process on all the continuous variables.

3.2 Model

In order to investigate the impact of voluntary third-party certification on the cost of corporate green bond issuance, we constructed the model (1) and specific as follows:

$$y_{i,t} = a \quad + \beta \quad x_{i,t} + \varepsilon$$
$$i = (1,2,3 \ldots ,138)$$
$$t = (2016,2017,2018,2019) \qquad (1)$$

Among them, Cost represents the issuance cost of the corporate green bond by the issuer i in the t-th year; the specific formula for calculating the credit spread is Cost = R—r.

The Cost of this equation speaks to the credit spread, which is the protection cost of green corporate bonds, and R speaks to the yield to maturity of the green corporate bonds when they are given. At present, China's green corporate bonds are given as 100 Chinese yuan fundamentally, which implies that the yield to maturity of green corporate bonds is equivalent to the coupon rate of green corporate bonds. r speaks to the yield to maturity of government bonds of a similar term gave simultaneously; thusly, we utilize the treasury bond yields.

Certification represents whether the corporate green bond is certified by a third party and issued in the t-th year; if it is certified by a third party, the value is 1, otherwise 0.

While Size and Maturity represent the amount and payment period of each corporate green bond; Rating represents the credit rating by credit assessment agency, in which unrated marked 0, AA marked 1, AA+ marked 2, and AAA marked 3. SHIBOR, GDP, CPI represents the macroeconomic factors of each corporate green bond in the insurance month.

Table 1: Overviews of variables.

Symbol	Description	Unit	Expected Sign	Source
Dependent Variable				
Cost	Issue cost = Coupon rate minus risk - free interest rate	%	/	Own calculation
Independent Variables				
Bond-Specific Factors				
Certification	voluntary 3RD party certification Unverified marked 0, verified marked 1	/	-	China Bond
Size	Issuance Sizes	CNY	-	China Bond
Maturity	Issuance Maturity	year	+	China Bond
Rating	Unrated marked 0, AA marked 1, AA+ marked 2, and AAA marked 3	/	-	China Bond
Macroeconomic Factors				
SHIBOR	Shanghai Interbank Offered Rate	%	+	East Money
GDP	quarterly GDP growth rate	%	+	East Money
CPI	Consumer Price Index	/	+	East Money

IV. RESEARCH RESULT

4.1 Descriptive Statistics

Table 2 shows the descriptive statistics of each variable. It is shown that the average issuance cost for the corporate green bonds is 2.85%, with a median of 2.62%; the highest issuance cost is 5.35%, and the lowest is -2.03%.

Table 2: Descriptive Statistics.

Variables	Mean	Medium	Standard Dev.	MIN.	MAX.
Cost	2.8514	2.6192	0.014131	-2.03	5.35
Size	11.25732	6.62	17.90479	0.1	200
Maturity	4.442029	5	1.62673	2	10
SHIBOR	3.496303	3.118205	0.583527	3.026619	4.730705
GDP	6.5015	6.6	0.002877	6.1	6.9
CPI	102.4739	102.3	0.870129	100.9	104.5

About 45% of corporate green bonds have been certified by a third party voluntarily, indicating that no more than half corporate green bonds have introduced a third-party assessment agency to assess the development of the project and its environmental benefits during the issuance process. The average issuance bond size of corporate green bonds is RMB 11.26 billion, but the average maturity is only about 4.44 years. At present, most green bonds in the international market have a maturity of 5 to 10 years. Subsequently, the development of Chinese corporate green bonds can be longer later on, and in this way the corporate green bonds will turn into a significant financing channel for endeavors to create mid-term and long haul green ventures.

Besides, large financing constraints and the fact that most of the energy-saving and environmental-friendly projects have not realized the internalization, which is of the positive environmental externalities, resulting in a relatively low bond return.

4.2 Univariate Analysis

We grouped corporate green bonds according to whether they were certified by a third party during the issuance process and performed univariate difference analysis on their coupon rates. As shown in Table 3, compared with corporate green bonds without third-party certification, the corporate green bond issuance cost within a third-party certification is significantly lower, which indicates that third-party certification can illustrate a positive signal to investors and reduce the issuance costs of corporate green bonds in the market.

Table 3: The coupon rates for different corporate green bonds with/without voluntary third-party certification.
(Unit: %)

	Certified		Uncertified		Difference	
	(N=62)		(N=76)			
	Mean	Medium	Mean	Medium	Mean	Medium
Coupon Rate	4.615	4.821	5.99	5.778	1.345***	0.94***

Note: *, **, and *** significant at 10%, 5%, and 1% levels, respectively

4.3 Correlation Analysis

We also employed the Pearson correlation coefficients of the main variables. It can be seen that the correlation coefficient between the corporate green bond issuance cost and the variable of certification is -0.4138, indicating that third-party certification can reduce the corporate green bond issuance costs. In addition, statistic result shows that the stronger the issuer's credit rating, the lower the issuance cost for corporate green bonds; as the Size/Maturity of the issuer increases, the issuance cost for corporate green bonds is getting lower and lower.

Table 4: Correlation test.

	Cost	Certification	Size	Maturity	Rating	SHIBOR	GDP	CPI
Cost	1.0000							
Certification	-0.4138	1.0000						
Size	-0.3944	0.1728	1.0000					
Maturity	-0.2479	-0.0171	0.0504	1.0000				
Rating	-0.5921	0.3631	0.3359	0.0333	1.0000			
SHIBOR	0.2946	0.0691	-0.0935	-0.1236	0.0488	1.0000		
GDP	0.0152	0.1605	0.0573	-0.0097	0.1663	0.7845	1.0000	
CPI	0.1011	-0.1041	-0.1481	0.0038	-0.2013	-0.4889	-0.8118	1.0000

4.4 Regression Analysis

Table 4 shows the regression results of the above model (1). Column (1) examines the impact of third-party certification on corporate green bond issuance costs without adding control variables. Only the explanatory variable of certification is evolved in the regression; column (2) examines the impact of control variables on corporate green bond issuance costs, which is only evolved other relevant control variables in the regression; Column (3) includes both other explanatory variables and the variable of certification. It shows that the regression coefficient of the variable of certification in column (1) is -1.07, which is significant at the 1% level; the regression coefficient of the variable of certification in column (3) is -0.613, which is significant at the 1% level. The results show that after controlling for other conditions, the third-party certified corporate green bond issuance cost is significantly lower.

Table 5: Regression results.

Variables	(1)	(2)	(3)
Certification	-1.07*** (0.00213)		-0.613*** (0.00169)
Size		-0.0262** (0.000113)	-0.0239** (0.000108)
Maturity		-0.133*** (0.000506)	-0.142*** (0.000484)
Rating		-0.514*** (0.000643)	-0.439*** (0.000648)
SHIBOR		1.27*** (0.00255)	1.19*** (0.00245)
GDP		-169.7** (0.755)	-125.9* (0.731)
CPI		-0.0780 (0.00178)	2.92e-03 (0.00172)
Constant	3.35*** (0.00143)	19.2 (0.219)	8.53 (0.211)
N	136	133	133
R^2	0.157	0.552	0.595

Note: *, **, and *** significant at 10%, 5%, and 1% levels, respectively

4.5 Regulatory effect of the Credit Rating

In order to investigate the impact of a credit rating behavior on the relationship between third-party certification and corporate green bond issuance cost, we also introduce the variable of certification in the model (1), crossover the term with a credit rating of the corresponding bond.

The Rating of a bond measures the debt rating of a corporate green bond. The debt rating is AAA, AA+, AA, which in turn corresponds to the credit rating values of 3, 2, 1; if the debt rating is "AA-" or the bond is not rated, we mark the dummy variable of Rating “0”.

The regression results are shown in Table 5. Among them, the control variable is not added to the regression in column (1), and the coefficient of the certification is -0.579, which is significant at the level of 10%, and the coefficient of the Rating is -0.516, which is significant at the level of 1%; the control variable is added to the regression in the (2) column, and also the crossover term is added. The variable of certification coefficient is -0.828, which is significant at the 1% level and the coefficient of the Rating is -0.481, which is significant at the level of 1%. However, the variable of crossover term Certification × Rating shows a positive related with insurance cost but not significant, the results show that when the credit rating of a corporate green bond is low, the third-party certification cannot function as a credit endorsement for the corporate green bond on reducing the issuance cost of corresponding corporate green bond.

Table 6: Regression result based on different Bond rating.

Variables	(1)		(2)	
	Coefficient	P-Value	Coefficient	P-Value
Certification	-0.579*	0.094	-0.828***	0.007
Rating	-0.516***	0.000	-0.481***	0.000
Certification ×Rating	4.59e-02	0.998	0.110	0.392
Size			-0.0239**	0.029
Maturity			-0.147***	0.003
SHIBOR			1.19***	0.000
GDP			-130.5*	0.078
CPI			-0.0106	0.951
Constant	4.03***	0.000	10.3	0.629
N	136		133	
R^2	0.392		0.597	

Note: *, **, and *** significant at 10%, 5%, and 1% levels, respectively

V. CONCLUSION AND POLICY SUGGESTION

5.1 Conclusion

In our examination, we locate that outsider confirmation can assume the job of credit underwriting of corporate green bonds, fundamentally diminishing the issuance cost of corporate green bonds, nonetheless, for a corporate green security with a low assessment, the outsider accreditation can't work as a credit support for the corporate green security on lessening the issuance cost of comparing corporate green security.

5.2 Policy Suggestion

At present, in spite of the fact that the important Chinese guidelines have moderately free necessities for third-party certification, and for the most part support and don't make obligatory prerequisites, most the corporate green bond financing ventures host executed its third-gathering certification. It is worth noting that there are still some problems in the corporate green bond evaluation and certification business, in terms of agency management, quality of certification reports, and comparability of certification conclusions.

Learned from international experience, it is possible to set up a self-regulatory organization, such as the third-party certification associations, which will issue related assessment and management methods to regulate the business development of third-party certification agencies.
Also, it is the responsibility of the relevant department to establish a third-party certification filing and screening system, to evolve some third-party certification agencies that are credible, objective and fair, into the list of socially recognized green bond certification agencies, in order to reduce the moral risk in the green bond certification process and increase the issuance efficiency of green bond. Besides, drawing on the certification experience from the Climate Bonds Initiative and other research institutes, it is recommended that the regulatory authorities should lead the third-party certification agencies together, participating in the formulation of green bond assessment and certification standards in combination with China's actual conditions to provide theoretical support for the development of green bond professional assessment and certification business.

Finally, as to certification report gave, the administrative authority may specify the base prerequisites for the exposure of data by third-party certification organizations, such as the basic information of green bond investment projects, the evaluation methods, and evaluation standards adopted, the calculation results of major quantitative indicators, and the qualitative analysis. As a result, and environmental benefits are also expected in the certification report.

REFERENCES

[1] Carter, R., & Manaster, S. Initial public offerings and underwriter reputation. The Journal of Finance, **45(4),** pp. **1045-1067**, **1990**.
[2] Chao Huang. Analysis of the impact of third-party certification on green bond issuance costs. Bonds, **(4), 17**, **2019**.
[3] Chen Wan. State-owned enterprises have obvious advantages in financing costs in the green bond market. Environmental economy, **3**, **2018**.

[4] Chen Xia, & Xu Songtao. Research on Characteristics and Enlightenment of Foreign Sovereign Green Bonds. Financial Development Research, (1), pp. **42-47, 2018.**

[5] Chu Yiqin, "Research on the Factors Affecting the Green Bond Issuance Price." Master's Thesis. Zhejiang University. Hangzhou, China, **2019**

[6] Dunbar, C. G. Factors affecting investment bank initial public offering market share. Journal of Financial Economics, 55(1), pp. **3-41**, **2000**

[7] Ehlers, T., & Packer, F. Green bond finance and certification. BIS Quarterly Review September, **2017**

[8] Foran, T., Resurreccion, B., Kansantisukmongkul, C., Wirutskulshai, U., Leeruttanawisut, K., & Lazarus, K. Sustainability assessment of Thailand's electricity planning: Using section 1 of the 2009 hydropower sustainability assessment protocol. **2010**

[9] Ge Xinfeng. Third-party certification status and development suggestions of China's green bonds. Financial Review, (8), pp. **77-82**, 2017.

[10] H. Wu, N. Zhang, "Willingness to Pay for Carbon Reduction Against Climate Change: A Social Survey in Beijing, China," International Journal of Scientific Research in Multidisciplinary Studies, Vol.**6**, Issue.**4**, pp.**46-50**, April **2020**.

[11] H. Wu and C. Kansuntisukmongkol, "What Drives the Carbon Price? -An Empirical Analysis of Chinese Emission Trading Scheme," presented at International Conference on Resources and Environment Sciences, Bangkok, Thailand, June 5-7, **2020**.

[12] Hao Wu, "What Drives the Carbon Price? -An Empirical Analysis of Chinese Emissions Trading Schemes," M.A. thesis, Faculty of Economics, Thammasat University, Bangkok, Thailand, **2020**.

[13] Hongyan Rong. International Rules and Enlightenment of Green Bond Operation Mechanism. Law, (2), pp. **124-134**, **2017**.

[14] Huang Jialing, Luan Xiaoli, Liang Yang, & Cao Anni. Research on the Influencing Factors of Green Corporate Bond Financing Costs: Based on Empirical Tests of Listed Companies in China. Contemporary Economy, (9), **13**. **2019**.

[15] Krishnasamy Tharsika, "Exploring the Nexus between Exchange Rate and Stock Price: A Case of Sri Lanka," World Academics Journal of Management, Vol.**8**, Issue.**2**, pp.**1-5**, **2020**

[16] Liu Pengfei, "Research on the pricing of Green Bond in China." Master's Thesis. Shandong Agricultural University. Xi'an, China, **2019**.

[17] Sutummakid, N., Kansantisukmongkol, C., & Sukhaparamate, S. Economic Growth and Environmental Degradation in Thailand: Linkage and Implications. In the International Conference on Agriculture, Environment, Food Security and Cooperation of Countries in Asian Sub-region . **2009**.

[18] Tang, A., Chiara, N., & Taylor, J. E. Financing renewable energy infrastructure: Formulation, pricing and impact of a carbon revenue bond. Energy Policy, 45, pp. **691-703**, **2012**.

[19] Warga, A., & Welch, I. Bondholder losses in leveraged buyouts. The Review of Financial Studies, 6(4), pp. **959-982**, **1993**.

[20] Yu, F. Accounting transparency and the term structure of credit spreads. Journal of financial economics, 75(1), pp. **53-84**. **2005**.

[21] Zhang Yan, & Shen Weiwei. Investigation and Analysis of Green Finance Development: A Case Study of Tongling City, Anhui Province. Journal of Chongqing University of Science and Technology (Social Science Edition), (2018 04), pp. **51-54**. **2018**

[22] Zhu Jiaming, & Zhu Jingyuan. Empirical Analysis on the Influencing Factors of Green Bond Coupon Interest Rate Based on Linear Regression. Journal of Liaoning University of Chemical Technology, **39 (4),** pp. **87-92**, **2019**.

