International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 7, No. 02 Mar-Apr; 2025 Page. No. 68-84

To cite this article: Chenhe Ge (2025). AN EMPIRICAL STUDY ON THE FACTORS INFLUENCING THE ISSUANCE (COUPON) RATE OF GREEN BONDS IN CHINA, International Journal of Research in Commerce and Management Studies (IJRCMS) 7 (2): 68-84 Article No. 348 Sub Id 654

AN EMPIRICAL STUDY ON THE FACTORS INFLUENCING THE ISSUANCE (COUPON) RATE OF GREEN BONDS IN CHINA

Chenhe Ge

· Budapest University of Technology and Economics, Faculty of Economic and Social Science, Department of Finance 1117 Budapest, 2 Magyar tudósok körútja, Bld. Q, wing "A", Hungary

DOI: https://doi.org/10.38193/IJRCMS.2025.7206

ABSTRACT

In recent years, China's green bond market has developed dramatically and is playing an increasingly important role in the global green finance sector. This paper selects all the green bonds that have been issued in mainland China from 2016 to 2022 in the Wind database as the initial sample, and through data screening and organizing, 734 valid samples were finally obtained to be used in the empirical analysis through constructing a multiple regression model, to deeply study which factors will affect the interest rate of the green bond issuance. The empirical results show that: (1) The green bond issuance (coupon) rate will change positively with the changes of the benchmark interest rate and the issuance period. (2) The green bond issuance (coupon) rate will change negatively with the issuance scale, the GDP per capita level of the issuer's region, the debt rating, and the third-party authentication status. (3) Since most green bond issuers in China are state-owned enterprises, the empirical analysis at the current stage could not reveal any significant relationship between the coupon rate of green bonds issued in the form of public offerings with the nature of their issuers.

KEYWORDS: Green bonds, Issuance (Coupon) rate, Influence factors, Empirical analysis

1. INTRODUCTION

The Climate Awareness bond issued by the European Investment Bank (EIB) in 2007 marked the birth of green bonds [1]. Then the World Bank and other Multilateral Banks started to issue green bonds. In 2014, the International Capital Market Association (ICMA) released the Green Bond Principles (GBP), which is the basis of the existing green labels and catalyzed the rapid development of the green bond market. In December 2015, the Interbank Bond Market Green Financial Bond Announcement released by the People's Bank of China, and the Guidelines for Issuing Green Bonds published by China's Development and Reform Commission (NDRC) marked the birth of China's green bond market. According to data from the Climate Bonds Initiative (CBI), China's green-labeled bond issuance in the domestic and foreign markets that meets the CBI's definition was US$85.4 billion in 2022, which has surpassed the United States (US$64.4 billion) and Germany (US$61.2 billion) to

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 7, No. 02 Mar-Apr; 2025 Page. No. 68-84

become the world's largest markets of green bond issuance. It can be seen that China's green bond market, although starting late, is developing rapidly and has become an important part of the global green bond market. However, at present, the exploration of green bonds in China mostly stays at the theoretical level. With the maturation of the green bond market, scholars have increasingly begun to quantify research, aiming to explore how to reduce the financing cost of green industry-related enterprises through green bonds. For instance, Xu examined the influencing factors affecting the interest rate of green bond issuance based on the sample data of green bonds in 2016-2017 using multiple regression and concluded that market interest rates and bond ratings have a significant impact on the interest rate of green bond issuance [2].

This paper selects green bond issuance (coupon) rate as the research object and analyzes which factors may have an impact on it, which not only can promote the overall development of the green financial system, but also can provide a Chinese sample for other countries to take the road of green development, which is of certain guiding significance.

2. LITERATURE REVIEW

This paper is highly relevant to the literature on the study of green bonds, especially the research on the factors influencing the issuance (coupon) rate of green bonds by the previous scholars is more instructive for this paper. B. Scholtens and L. Dam examined whether banks adopt the Equator Principles, found that green bonds play an important role in maintaining the ecological balance, the issuance of green bonds also has a far-reaching impact on the sustainable development of the society [3]. Wood and Grace argue that factors such as the scale of the bond and the intensity of the issuer's project follow-through can affect the development of the green bond market [4]. J. A. Mathews believes that not only are green bonds good for environmental protection and important for building a sustainable society [5]. However, as C. Kaminker and F. Stewart also emphasized it, he believes that green bonds as a kind of innovative bond can also make companies more competitive in the future sustainable development and can attract more investors [6]. Yang and Shi based on the data of green bonds issued by non-financial institutions from April 2016 to March 2019, used linear regression model to analyze the influencing factors of green bond issuance pricing [7]. It is concluded that green bonds issued in the form of public offerings are conducive to the company's reduction of financing costs. Zheng and Hu examined the green premium and concluded that green bonds have a significantly negative green premium in the secondary market, indicating that the issuance of green bonds can significantly reduce the financing cost of the company compared with ordinary bonds [8].

Green bond coupon rates and its influencing factors have been studied earlier in developed countries, and the risk characteristics of green bonds are basically the same as conventional bonds with regard to the same issuer but there are differences between the coupon rates of green bonds and conventional

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 7, No. 02 Mar-Apr; 2025 Page. No. 68-84

bonds [9]-[10]. Research on the pricing of green bonds can be traced back to Brennan and Schwartz, who introduced natural resource factors in green bonds, quantified the costs, and summarized two first-order option pricing equations for both closed-end and open-end [11]. Zerbib compared green bonds with traditional bond financing methods, and the results show that green bonds have more advantages compared with other financing methods in terms of bond issuance costs, tax costs and extraction costs, while enterprises can greatly reduce the cost of corporate financing through the issuance of green bonds [12]. Flaherty and Gevorkyan construct a three-item model (NMPC) based on the Sachs Model, which demonstrates that the bonds are repayable, the debt is sustainable, and that factors such as low interest rates and low inflation are favorable for the long-term development of green bonds [13]. Park empirically analyzes the factors influencing the yield differential between the green bond market and ordinary corporate bonds, it is found that the spreads are mainly determined by ratings, resale clauses and third-party assessments [14]. In addition, the level of spreads is lower for companies with government guarantees. Hachenberg et al. concluded that the cost of third-party certified bonds increases, leading to higher interest rates, while the government can reduce the cost of corporate issuance through financial support [15]. Britta et al. through a panel data regression found that compared to traditional bonds, issuance maturity and scale do not have a significant effect on the price of green bonds, while the industry in which the issuer operates, and the grading have a significant effect [15]. Chen found that if the green bond issuer is a state-owned enterprise, its issuance (coupon) rate will be lower compared to other issuers [16]. At the same time, the better the credit rating of the enterprise, the more it can maintain the issuance interest rate at a relatively low level. Wang proposed that third-party certification can significantly reduce the issuance interest rate of green bonds through regressivity analysis [17]. Zheng selected the cross-sectional data of green bonds in China from 2016 to 2018[8]. Through linear regression analysis, it is concluded that the result of interest rate marketization is highly positively correlated with the issuance interest rate. The issuance term, issuance scale, degree of third-party certification, and bond rating will affect the issuance rate and show a negative correlation.

As can be seen from the above (but not limited to) relevant literature, with the development of the global green bond market, domestic and foreign scholars' research on it has gradually favored quantitative analysis and practical application from the theoretical level. This paper follows the research trend and seizes the research hotspot. Through the actual data of China's green bond market, it conducts empirical research on the influencing factors of green bond coupon rate, aiming to put forward reasonable suggestions for the healthy development of China's green bond market.

3. Current status of China’s Green Bond Market

3.1 Scale and number of green bond issuance

According to a report on China's sustainable bond market jointly compiled by the Climate Bonds

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 7, No. 02 Mar-Apr; 2025 Page. No. 68-84

Initiative, the CCDC Research and the CIB Research, since China began issuing green bonds in 2016, the country's domestic issuance of green bonds that year grew from almost zero to US$36.2 billion, accounting for 39% of the worldwide issuance. After two successive years of increasing green bond market participation, Chinese issuers issued a total of US$55.8 billion of green bonds in both the domestic and foreign markets in 2019, up 33% year-on-year. Due to the COVID-19 2020 the green bond market witnessed a short setback. China's green bond market achieved a strong rebound in 2021, with total labeled green bond issuance in both the domestic and external markets growing 140% year-on-year to US$109.5 billion which was continued by a 35% year-on-year expansion in 2022.

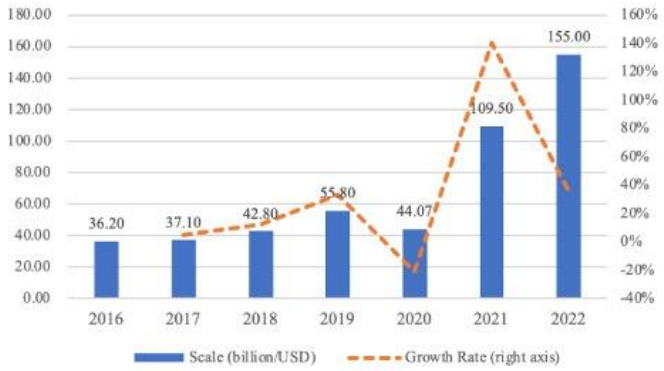

Figure 1: China's green bond issuance scale in 2016 to 2022

In terms of the number of issuances, the total number of green bond issuance for the year 2016 was 79 which jumped to 175 and 210 in 2017 and 2018 respectively. With 415 green bond issuances the upward trend continued in 2019, up about 98% from the previous year. The rapid growth of China's green bond issuance in 2021 was 765 total issuances, an increase of around 60% year-on-year. the number of green bonds in issued in 2022 only increased by 6% over the previous year, totaling 811.

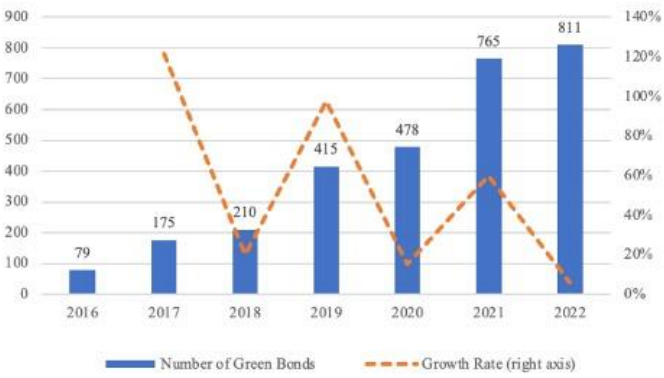

Figure 2: Number of green bonds issued in China from 2016 to 2022

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 7, No. 02 Mar-Apr; 2025 Page. No. 68-84

3.2 Existing type of green bonds

With the development of the green bond market, the types of green bonds are constantly enriched. By organizing the panel data of green bonds during the period of 2016-2022, it is found that, among various types of green bonds, the issuance of green debt financing instruments and green asset-backed securities ranked first and second, with 773 and 753 respectively. The number of green corporate bonds and green local government bonds issued was insignificantly different, with 439 and 523 respectively. The number of green international bonds issued abroad by domestic entities is less, with only 3, and the reason may be related to the difficulty of its issuance.

As Figure 3 shows although the number of green financial bond issues ranked 5th, the overall issuance scale was larger than that of all other types of bonds, accounting for 27.09%, which ranked 1st. Secondly, the issuance scale of green local government bonds and debt financing instruments also accounted for over 20% of the total issuance scale. The issuance scale of green corporate bonds, green asset-backed securities, and green enterprise bonds accounted for 11.71%, 7.09%, and 6.36% of the total issuance scale respectively, while the issuance scale of green international bonds only accounted for 0.17%.

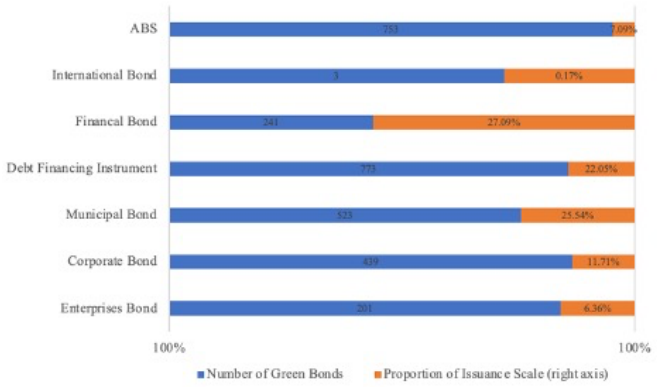

Figure 3: Types of China's green bonds issued in 2016-2022

3.3 Issuance term and grading of green bonds

The overall maturity of green bonds issued in China's domestic market in 2016-2022 is relatively long, and only green bonds issued in whole years were shown in Figure 4. The total number of green bonds with a maturity of 15 years and above only amounted to 372 and 676 were issued with a maturity of less than 3 years, while the 3-year maturity was the most popular. Overall, the term of the green bond issuance in China spanned a wide range of durations, of which the overall green bond market, the 3-year, 5-year, 7-year and 10-year medium- and long-term bonds accounted for a larger proportion.

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 7, No. 02 Mar-Apr; 2025 Page. No. 68-84

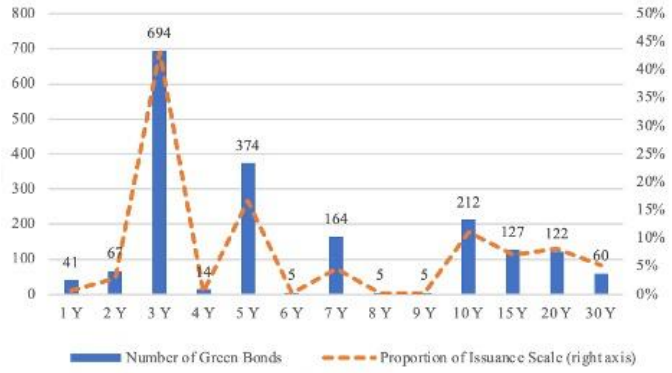

Figure 4: Term of China's green bonds issued in 2016-2022

The enterprises issuing green bonds have been present with a continuous development and maturity in China's green bond market. However, as can be seen in Figure 5 and 6, not only with respect to the number of green bond issues, but also the scale of green bond issues, state-owned enterprises still account for a large proportion, and the participation of private enterprises is relatively weak.

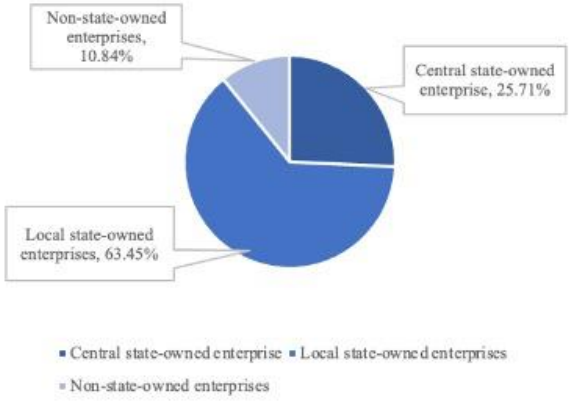

Figure 5: Type of issuer- by number of deals

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 7, No. 02 Mar-Apr; 2025 Page. No. 68-84

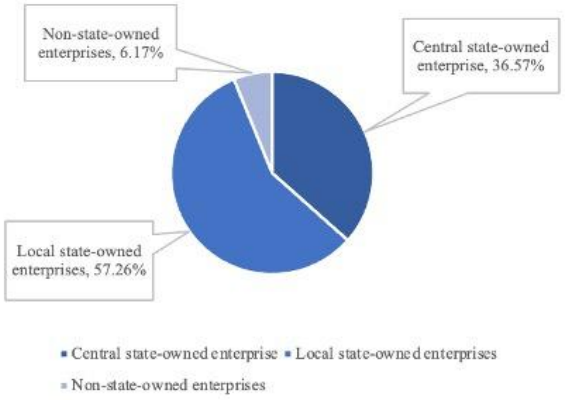

Figure 6: Type of issuer- by number of amounts

Green bond ratings in China are maintained at a high level from 2016 to 2022 with a total of 1730 AAA-rated, 313 AA+-rated, 102 AA-rated, in addition 9, 9 and 3 AA-, A+ and A- bonds, respectively. It can be seen that the rating of China's green bonds is basically above AA, which is mainly due to the fact that most of the enterprises issuing green bonds are state-owned enterprises, and their solvency is endorsed by the government, resulting in a low degree of rating differentiation.

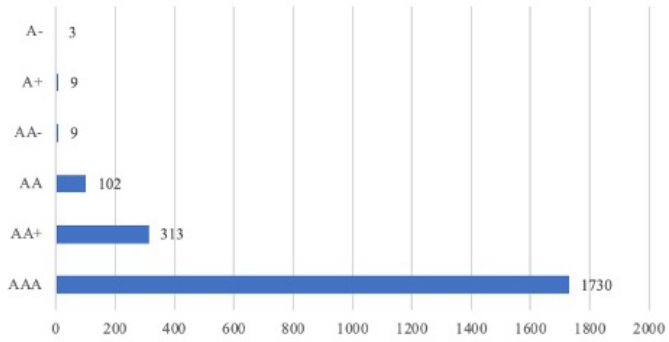

Figure 7: Grade of China's Green bonds in 2016-2022, number of bonds outstanding

3.4 Coupon rate of green bonds

The following figure (Figure 8) illustrates the overall coupon rate trend of green bonds in China during the 2016-2022 period. Since there were a large number of data, the average value of the coupon rate of green bonds issued in each month of the past seven years was selected for statistical purposes when analyzing its overall trend. At the same time, the average monthly treasury bond interest rate with the same issuance duration was selected as the base rate for comparison. It can be seen that in 2016-2022, the overall coupon rate trend of green bonds is roughly the same as the overall trend of the benchmark

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 7, No. 02 Mar-Apr; 2025 Page. No. 68-84

interest rate, and the overall average coupon rate of green bonds was 0.94% higher than the benchmark interest rate. Since 2016 was the first year of issuance of green bonds in China, in addition to no green bonds issued in February, the overall fluctuation of the green bond coupon rate remained large. During 2017-2018, the coupon rates on green bonds were higher overall, remaining above 5% and with a peak rate of 6.09% in December 2017. With the development of the green bond market, the volatility of the green bond interest rate gradually decreases, and it can be seen that the green bond interest rate gradually converges to the average coupon rate of 3.98% over the 7-year horizon from 2019 onwards.

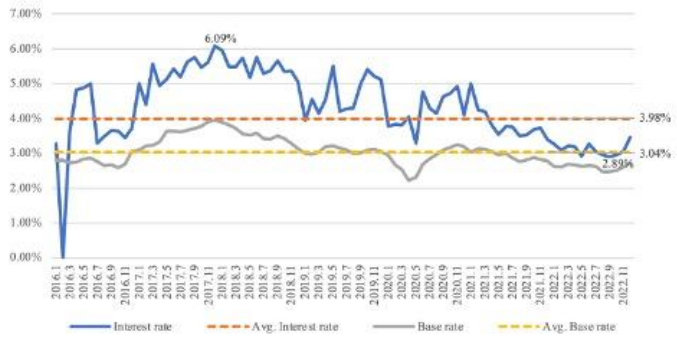

Figure 8: Interest rate trend of China's Green bonds from 2016 to 2022

4. Empirical Analysis of Influencing Factors of the Coupon Rate of Green Bonds

4.1 Coupon rate of green bonds

In this paper, 2,933 green bonds issued by Chinese domestic entities from 1 Jan 2016 to 31 Dec 2022 in the Wind database were selected as the initial sample. From the overall data, 327 green bonds with missing primary data due to data availability, 459 green bonds with missing debt ratings, and 8 green bonds issued by domestic entities outside China were excluded. A total of 177 sub-species of green bonds with a single use of proceeds, such as blue bonds, "carbon neutral" bonds and epidemic prevention and control bonds, were also excluded. Since government bonds are backed by the government's tax capacity and characterized by income tax exemption on interest earnings, which has a certain impact on the issuance rate, therefore 523 local government bonds were excluded. Due to the differences between private bonds and public bonds in terms of issuance targets, collection methods, issuance objects, information disclosure requirements, investment restrictions, etc., 677 green private bonds were excluded. In addition, the empirical study of green bonds in this paper excludes 28 subordinated bonds from the overall sample due to the low interest rate of subordinated bonds compared to ordinary bonds and the higher risk they face. Finally, 734 valid samples were obtained, including 173 green enterprises bonds, 174 green corporate bonds, 197 green financial bonds, 159 green debt financing instruments and 31 green asset-backed securities.

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 7, No. 02 Mar-Apr; 2025 Page. No. 68-84

4.2 Variable selection

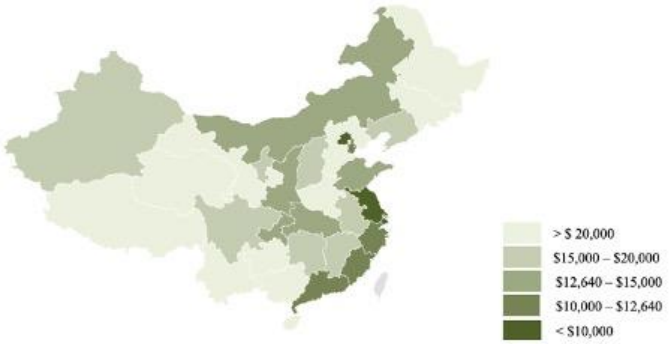

Figure 9: GDP per capita by province-level divisions of Mainland China in 2022

In this paper, the issuance interest rate (that is, coupon rate) of green bond issuance was selected as dependent variable, and the benchmark interest rate, the level of GDP per capita in the region where the bond issuer is located, the scale of issuance, the issuance term, the rating of the bonds, the nature of the issuer, as well as whether the green bond is authorized by the independent third party to be green were used as the explanatory variables together.

The specific information of the variables is shown in the following table.

Table 1: Interpretation of relevant variables

Variate	Name	Symbol	Definition
Explained Variable	Coupon rate	CouponRate	Issuing interest rate of green bonds
	Base rate	Baserate	The interest rate of government bonds with the same month and the same or similar maturity as green bonds
Explanatory Variables	GDP per capita	GDPpercapita	Dummy variable, (+∞,$20000)=5 [$15000, 20000]=4 [$12640, $15000)=3 [$10000, $12640)=2 ($10000, +∞)=1
	Issuing scale	Scale	Bond issuance scale, unit: 100 million RMB

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 7, No. 02 Mar-Apr; 2025 Page. No. 68-84

Issuing term	Term	Bond issuance period, unit: year
Rating of bonds	Grade	Dummy variable, AAA=6 AA+=5 AA=4 AA-=3 A+=2 A-=1
Nature of issuing entity	SOE	Dummy variable, State-owned enterprise=1 Non-state-owned enterprise=0
Third party Certification	Authentication	Dummy variable, Certified=1 Non-certified=0

4.3 Descriptive statistics

Table 2 provides the descriptive statistics of the variables of the green bond sample selected in this paper. The maximum value of green bond issuance interest rate is 7.8%, the minimum value is 0.1%, the average value is 4.06%, and the standard deviation is 1.1165, which indicates that the fluctuation of green bond issuance interest rate is small. In this paper, according to the level of per capita GDP of each provincial-level administrative region in mainland China in 2022 released by the National Bureau of Statistics, the issuer's location is distinguished into 5 categories and attributed a value of 1-5. The analysis results displayed that the average value is 3.46, indicating that the level of GDP per capita of the bond issuers' location is over the national level of GDP per capita ($12,640). The average issuance scale was 1.907 billion USD and the average maturity 4.46 years. The sample data were selected from AAA, AA+, AA, AA-, A+, and A- rated bonds and were assigned values 1-6 respectively. The analysis results show a mean value of 5.54, indicating that there are more AAA rated bonds and the overall rating status is better in the selected sample of 734 green bonds. The mean value of the dummy variable for whether it has been certified by an independent third-party assessment is 0.57, indicating that nearly half of the green bonds in the full sample have been certified by an independent third party. The mean value of the dummy variable for whether or not it is a state-owned enterprise is 0.87, indicating that the vast majority of enterprises currently issuing green bonds are state-owned enterprises.

Table 2: Interpretation of relevant variables

Variable	Obs	Mean	Std. dev.	Min	Max
Rate	734	4.056117	1.11654	0.1	7.8
Baserate	734	2.8235	0.4271571	1.4052	4.06
GDPpercapita	734	3.463215	1.348288	1	5
Scale	734	19.06637	34.58258	0.3	300
Term	734	4.46232	2.492049	0.1918	20
Grade	734	5.542234	0.7974984	1	6
Authentication	734	0.5735695	0.4948952	0	1
SOE	734	0.8678474	0.3388875	0	1

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 7, No. 02 Mar-Apr; 2025 Page. No. 68-84

4.4 Correlation test

Table 3 represents the results of the correlation test. According to the correlation matrix of the variables, it can be concluded that the green bond coupon rate presents a strong positive correlation with the base rate. The coupon rate of green bonds has a negative and strong correlation with the bond issuance scale, issuance term, debt rating, and whether it has been certified by an independent third party. The correlation test results show that there is no significant relationship between the coupon rate of green bonds issued in the form of public offerings with the nature of their issuers.

Table 3: Variable correlation test

	CouponRate	BaseRate	GDPpercapita	Scale	Term	Grade	Authentication	SOE
CouponRate	1.0000							
BaseRate	0.652***	1.0000						
GDPpercapita	-0.292***	-0.123***	1.0000					
Scale	-0.243***	-0.068*	0.0138***	1.0000				
Term	0.367***	0.387***	-0.073**	-0.098***	1.0000			
Grade	-0.437***	-0.117***	0.225***	0.190***	0.025	1.0000		
Authentication	-0.322***	-0.152***	-0.023	0.187***	-0.402***	-0.029	1.0000	
SOE	0.048	0.082**	-0.000	-0.004	0.208***	0.215***	-0.223***	1.0000

4.5 Model establishment

Since the time of development of the green bond market in China has been relatively short, the corresponding market supervision as well as risk evaluation methods have not yet been perfected, and the green bond guidance mechanism is not sound enough, the green bond issuance interest rate may be affected by a variety of factors. Through a large number of literature studies, this paper refers to Wang (2018), Zhu (2019) on the study of the impact factors of green bond coupon rates and Yao (2017) on the analysis of spreads, and finds that they all use linear regression methods to conduct empirical analyses, so this paper also chooses to utilize multivariate linear regression to study the impact factors of the interest rate of green bond issuance, eliminating the non-significantly correlated SOE , the model reference formula is as follows:

$$CouponRate = C + \beta_1 BaseRate + \beta_2 GDPpercapita + \beta_3 Scale + \beta_4 Term + \beta_5 Grade + \beta_6 Auth + \mu \quad (1)$$

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 7, No. 02 Mar-Apr; 2025 Page. No. 68-84

where C means the constant term, β_i means the coefficients of the explanatory variables, and μ means the random error.

According to the discriminant of the VIF test, the larger the VIF value, the more serious the multicollinearity. It is generally considered that when VIF is greater than 10 (strictly 5), it represents that the model has serious covariance problems. Or the tolerance value as a criterion, the tolerance value = 1/VIF, so the tolerance value is greater than 0.1 (strictly is greater than 0.2) means there is no covariance. After removing the irrelevant factor SOE, it can be seen through Table 000 that the model passes the VIF test, which indicates that the correlation between the explanatory variables is low, and it can be assumed that there is no significant multicollinearity.

Table 4: VIF test

Variable	VIF	1/VIF
Term	1.38	0.723951
Authentication	1.23	0.809839
BaseRate	1.20	0.830002
Grade	1.10	0.906989
Scale	1.09	0.916293
GDPpercapita	1.08	0.925115
Mean VIF	1.18	

4.6 Regression analysis and results

In this paper, stata17 was selected for regression analysis and the results were shown in the table below. The model adjusted R2 is 0.6465, the significance level is 0.000, so, the model fit is good.

Table 5: Regression analysis

Variable	Coefficient	Std.err.	t	P>|t|
Baserate	1.391362	0.0632637	21.99	0.000***
GDPpercapita	-0.1156707	0.0189846	-6.09	0.000***
Scale	-0.002496	0.0007437	-3.36	0.001***
Term	0.0296646	0.011611	2.55	0.011**
Grade	-0.4711275	0.0324154	-14.53	0.000***
Authentication	-0.4806035	0.0552802	-8.69	0.000***
_conS	3.330176	0.2658506	12.53	0.000***
R2	0.6465	Adj-R2	0.6436	
F Value	221.63	Sig	0.000	

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

The base interest rate is the interest rate with universal reference in the financial market, which is one of the important prerequisites for the marketization of interest rates. The national debt is the debt issued by the central government of our country based on its taxing power as a guarantee, and it has the characteristics of the highest credibility and the lowest risk among all the financial products, so

the selection of the national debt interest rate as China's base rate can not only satisfy the basic requirements of the prime rate, but also effectively transmit the market signals and regulatory signals. In the empirical analysis, the regression coefficient of quasi-interest rate is 1.391, P=0.000<0.01, which is significant at the 1% level, indicating that the interest rate of green bond issuance is positively correlated with the yield of treasury bonds with the same issuance time and the same or similar issuance period, which means that the interest rate of green bond issuance will increase with the growth of base rate.

GDP per capita, as one of the most important macroeconomic indicators, reflects the affluence and economic development level of a country or region. The results of the regression analysis show a strong negative correlation between the interest rates on green bond issues and GDP per capita, indicating that investor confidence in environmental protection and sustainable development is affected by the level of GDP per capita. In relatively affluent regions, investors may be more inclined to support green bond projects, thus lowering the interest rates on these bonds.

Since green bonds are bonds dedicated to supporting environmental protection and sustainable development projects with certain social responsibility and sustainability characteristics, the scale of green bond issuance reflects from the side the extent to which a company can enhance its environmental image. The results of regression analysis show that the scale of green bond issuance was negatively correlated with its coupon rate, indicating that the larger the scale of issuance, the stronger the environmental protection image of its issuer, and investors may be more willing to accept a lower coupon rate in order to demonstrate its commitment to sustainable development.

The regression coefficient of issue term was 0.0297, P=0.011<0.05, which is significant at the 5% level, in line with the liquidity preference theory and interest rate term theory. That is, investors are more inclined to choose short-term bonds with higher liquidity in the process of investment, and because of the better liquidity of such bonds, their risk is relatively low, and their yield is also low. The longer the maturity of the bond, the worse the liquidity, the corresponding interest rate risk is also higher, investors need a higher risk premium as compensation.

In the mature bond market, credit rating is one of the necessary conditions for bond issuance and the key for investors to carry out investment activities, and theoretically the bond rating will directly affect the bond issuance rate. The regression coefficient of bond rating was -0.471, P=0.000<0.01, which was significant at the 1% level. It indicates that the higher the green bond rating is, the lower the associated credit risk is, and thus the lower the coupon rate is.

The core of green bonds, as a special kind of bond, lies in its unique green attributes. Third-party

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 7, No. 02 Mar-Apr; 2025 Page. No. 68-84

certification requires an independent third-party certification organization to evaluate the green projects invested in green bonds, investigate the authenticity of the use of the raised funds and continuously track their subsequent flow, etc. The regression analysis shows that the regression coefficient of the independent third-party certification status is -0.481, P=0.000<0.01, which is significant at the 1% level. Thus, it can be shown that the third-party certification agency certification can endorse the green attributes of green bonds to a certain extent, reduce the problem of information asymmetry between market investors and issuers, and thus reduce the risk of green bond investment. According to the relationship between risk and return, the coupon rate of green bonds certified by third-party certification is lower.

The final regression model obtained is as follows:

$$CouponRate = 3.330 + 1.391BaseRate - 0.116GDPpercapita - 0.002Scale + 0.030Term - 0.471Grade - 0.481Auth \quad (2)$$

5. CONCLUSIONS AND SUGGESTIONS

5.1 Conclusions

This paper selects all green bonds issued in China from 2016 to 2022 as panel data to summarize the development status of China's green bond market. Meanwhile, literature analysis, comprehensive analysis, statistical analysis, comparative analysis and empirical analysis are used to explore the factors affecting the interest rate of green bond issuance. In the process of empirical analysis, this paper mainly selects benchmark rate, the GDP per capita level of the region where the issuer is located, bond issuance scale and issuance term, bond rating, the nature of the issuer, and third-party certification status as the research indicators. By constructing a multiple regression model, the correlation between these indicators and the green bond coupon rate is analyzed. The model fitted well in general and was able to explain the correlation between the relevant variables on the coupon rate of green bond issuance better. The following conclusions are drawn:

1. The coupon rate of green bonds will change positively with the benchmark rate as well as the term of the bond issue.
2. The more, the higher or the better the level of GDP per capita of the issuer's region, the scale of bond issuance, the bond rating, and the status of third-party certification, the lower the coupon rate of the green bond.
3. There is no significant relationship between the interest rate of green bonds issued in the form of public offerings with the nature of their issuers.

The conclusion is basically consistent with Zheng (2021), Xu (2019), etc., that is, the issuance period, issuance scale, third-party certification and bond rating of bonds will have an impact on the issuance interest rate and show a negative correlation.

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 7, No. 02 Mar-Apr; 2025 Page. No. 68-84

5.2 Suggestions

A. The government should broaden guidance channels and increase enterprise support for the issuance of green bonds. In order to achieve a healthy and sustainable development of China's green bond market, in addition to standardizing the policy guidelines related to green bonds, the government should also actively guide issuers, financial institutions and investors simultaneously. This seemingly virtuous circle of the dominance of state-owned enterprises may lead to other issuing bodies will gradually withdraw from the field of green bonds. Therefore, the government should further standardize the issuance conditions of green bonds for state-owned enterprises. Meanwhile, increase policy support for non-state-owned enterprise issuers which do not have the advantage to create convenience for their issuance of green bonds.

Establishment of comprehensive credit rating standards and strengthening of independent third-party certification of green bonds. Through empirical research, this paper concludes that there is a more significant relationship between green bond coupon rates and bond ratings, that is, the higher the credit rating, the lower the bond issuance rate. Therefore, a comprehensive credit rating standard system should be established, and indicators such as the degree of greenness of companies, green construction and green systems should be introduced to strengthen the "greenness" of green bond ratings.

In the issuance and project operation of green bonds, a certain degree of information transparency should be guaranteed. It aims to protect the right to know and the right to choose of market investors, reduce the investment risk of investors, so as to reduce the financing cost of the issuer. Therefore, the relevant departments should improve the green bond information disclosure system. However, at present, there are controversies over the information disclosure of private placement green bonds in China, as information disclosure is not mandatory for bonds issued in private placement. Therefore, China's government, financial institutions, regulatory authorities and others should conduct further research on the information disclosure mechanism of private placement green bonds and formulate a reasonable information disclosure policy for private placement green bonds.

Enriching the main participants of green bonds and enhancing the activity of the market. To promote the smooth, healthy, and sustainable development of the green bond market and reduce the information mismatch between green bond issuers and investors. Meanwhile, the cultivation of professionals in the field of green bonds should also be strengthened. Development of green finance involves two major fields of economy and environmental science, green bonds as a branch of green finance is also a cross-field and in-depth professional discipline, therefore, there is an urgent need for talents with professional knowledge to promote its development.

Strengthening international cooperation in China's green bond market is key to realizing the

sustainable development goals. Through interaction with the international market, China's green bond market can better integrate into the global green financial system and enhance international competitiveness. Climate change is a global challenge, China should join hands with other countries to explore how to better promote low-carbon economy and sustainable development through green financial means.

In general, the future development of China's green bond market is full of great potential. By enhancing market transparency and standardization, strengthening policy support, investor education, financial innovation, and international cooperation, it is believed that China can build a healthier and more sustainable green bond market and contribute to the promotion of sustainable development.

REFERENCES

[1] Y. Chen and Z. J. Zhao, "The rise of green bonds for sustainable finance: global standards and issues with the expanding Chinese market," Current Opinion in Environmental Sustainability, LII, pp. 54–57, 2021.

[2] X. Xu, "Empirical analysis of factors influencing interest rates of green bond issuance in China - based on the loanable funds model", Operation and Management, VI, pp. 21-23, 2019.

[3] B. Scholtens and L. Dam, "Banking on the Equator. Are Banks that Adopted the Equator Principles Different from Non-Adopters?" World Development, XXXV (8), pp. 1307–1328, 2007.

[4] D. Wood and K. Grace, "A Brief Note on the Global Green Bond Market," Initiative for Responsible Investment at Harvard University. 2011. Available: https://iri.hks.harvard.edu/files/iri/files/iri_note_on_the_global_green_bonds_market.pdf

[5] J. A. Mathews, "Green growth strategies: Korean and Chinese initiatives," Carbon Management, III (4), pp. 353–356, 2012.

[6] C. Kaminker and F. Stewart, "The Role of Institutional Investors in Financing Clean Energy," OECD Working Papers on Finance, Insurance and Private Pensions, XXIII, 2012.

[7] X. Yang and B. Shi, "Factors affecting the pricing of green bonds", Financial Forum, XXV (1), pp. 72-80, 2020.

[8] L. Zheng and X. Hu, "Analysis of the main factors affecting the interest rate of green bonds in China", Journal of Huainan Normal University, XXIII (1), pp. 24-30+48, 2021.

[9] T. Ehlers and F. Packer, "Green bond finance and certification." BIS Quarterly Review, 2017. Available: https://ssrn.com/abstract=3042378

[10] H. Tuhkanen, "Green bonds: a mechanism for bridging the adaptation gap?", Stockholm Environment Institute, 2020. [Online]. Available: https://www.sei.org/wp-content/uploads/2020/02/sei-working-paper-green-bonds-tuhkanen.pdf

[11] M. J. Brennan and E. S. Schwartz, "Evaluating Natural Resource Investments," The Journal of Business, LVIII (2), pp. 135–157, 1985.

[12] O. D. Zerbib, "The green bond premium", 2017. Available: https://doi.org/10.2139/ssrn.2890316

[13] M. Flaherty, A. Gevorkyan, S. Radpour, and W. Semmler, "Financing climate policies through climate bonds – A three stage model and empirics," Research in International Business and Finance, XLII, pp. 468–479, 2017.

[14] S. Park and J.-K. Kim, "Analysis of inaccurate data with mixture measurement error models," Journal of the Korean Statistical Society, XLVII (1), pp. 1–12, 2018.

[15] B. Hachenberg and D. Schiereck, "Are green bonds priced differently from conventional bonds?" Journal of Asset Management, XIX (6), pp. 371–383, 2018.

[16] J. Chen, "Research on China's green bond issuance pricing", Central China Normal University, 2018. Available: https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD201802&filename=1018236200.nh

[17] X. Wang, "Empirical analysis of factors affecting the interest rate of green bond issuance in China", Times Finance, XXVII, pp. 223-224, 2018.

Author Profile

Chenhe Ge received a B.Sc. degree in Engineering from Inner Mongolia Agricultural University, China, in 2020, and a M.Sc. degree in Finance from the University of Technology and Economics, Budapest, Hungary, in January 2023. In September of the same year, he pursues a PhD at the same university in financial economics with a focus on green finance and monetary policy. He is currently interning in the Corporate Banking Department of Bank of China (Central and Eastern Europe) Ltd.