A Note on the yield spread of Russian green bonds

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Abstract. The global market for ESG financial instruments is actively developing. In Russia, this segment is narrow but has significant prospects for growth. Green bonds serve as a classic ESG financial instrument. There is a hypothesis in literature that investors should be aware of sustainable development goals and accept lower yields when investing in green bonds. The authors tested this hypothesis using Sustainable Development Sector bonds on the Moscow Exchange. Bonds of six issuers that had both green and classic bonds were selected as instruments for the study. The research methods employed included statistical observation, measurement, and comparison. The following results were obtained: (1) the hypothesis was not confirmed, possibly due to the limited sample size and the status of the Russian financial market as an emerging one; (2) it is advisable to introduce tax incentives for individual and institutional investors regarding coupon income and discount of green bonds to actively develop the green bond market; (3) it is necessary to evaluate the effectiveness of tax support for issuers and investors from the government's perspective. The authors also identified challenges in the development of the green bond market and proposed future research directions, including analyzing yield spreads of green bonds on Chinese exchanges, studying green stocks, and mutual fund units.

Keywords: green bond, yield, yield spread, sustainable development sector of the Moscow Exchange.

1 Introduction

The premises of this study are explained as follows:
- The segment of ESG-type financial instruments is rapidly developing, with green bonds predominating [1]. In Russia, these instruments are represented in the Sustainable Development Sector of the Moscow Exchange and have significant prospects for development [2].
- 98% of institutional investors track ESG ratings of issuers [3], indicating investors' interest in responsible investing. In general, ESG criteria are widely adopted in investment
practices [4], and ESG ratings are also assigned to mutual funds and ETFs [5].

- The provision of tax benefits to investors in green bonds is widely discussed and remains a subject of debate [6-8].
- In Russia, at the state level, there is a subsidy for coupon payments to issuers of green bonds as part of the national project "Ecology."

The research hypothesis is formulated as follows: the yield of green bonds is lower than the yield of classic bonds due to two reasons:
- Responsible investing, which involves investors understanding the goals of sustainable development and accepting lower returns in exchange for contributing to societal development.
- Potentially lower returns from green projects.

According to the hypothesis, green bonds exhibit a negative yield premium compared to classic bonds.

The objective of this study is to test the formulated hypothesis in relation to the Russian market of green bonds in the Sustainable Development Sector of the Moscow Exchange.

The theoretical basis of the research includes articles on the pricing of green bonds by F. Wulandari, D. Schäfer, A. Stephan & C. Sun, C. [9], J. Caramichael and A. Rapp A. [10], S. Feliciano [11], A. Pietsch and D. Salakhova D. [12], Y. Wu. [13]. Among Russian economists, similar research has been conducted by A. Emets [14-15], A.L. Bulgakov, and S.D. Smirnov [16]. Regarding the study of tax benefits for owners of Russian bonds, the work of O.S. Belomyttseva and L.S. Grinkevich should be noted [17].

2 Materials and Methods

The study utilized statistical data from the Moscow Exchange on trading Russian bonds (both green and non-green) from June 1, 2022, to April 28, 2023, as well as the values of the Moscow Exchange Corporate Bond Index (RUCBITR). Since green bonds are mostly corporate bonds, the values of the Corporate Bond Index were used for the purpose of comparing the yield of green bonds with the average market yield.

The statistical materials for the research were collected by the authors in the Sustainable Development Sector of the Moscow Exchange. As of April 28, 2023, the Sustainable Development Sector included bonds from 15 issuers, comprising 17 issuances of green bonds (total issuance amount - 199.6 billion rubles), 5 issuances of social bonds (total issuance amount - 26.2 billion rubles), and 5 issuances of national and adaptation project bonds (total issuance amount - 50 billion rubles). As a result of analyzing the data on green bond issuances and daily trading volumes, the authors selected 6 issuers who had both green and non-green bonds with similar issuance parameters (Table 1).

While traditional studies by economists compare the yield of a sample of green and non-green bonds, the authors of this article concluded that it is necessary to analyze green and non-green bonds of the same issuer with similar issuance parameters (loan amount, maturity period, coupon rate). This approach to analyzing the yield of green bonds is being applied for the first time. According to the authors, comparing bond issuances of the same issuer is more accurate and conclusive. Furthermore, it is worth noting that the issuer usually enters the market with green bonds already being known on the exchange and having other issuances of classic bonds.
### Table 1. A selection of bonds of the Sustainable Development Sector of the Moscow Exchange.

<table>
<thead>
<tr>
<th>Type of bonds</th>
<th>Issuer</th>
<th>ISBN</th>
<th>Amount, million rubles.</th>
<th>Maturity in years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Moscow City Government</td>
<td>RU000A1033Z8</td>
<td>70 000</td>
<td>7</td>
</tr>
<tr>
<td>Non-green</td>
<td>Moscow City Government</td>
<td>RU25073MOS0</td>
<td>70 000</td>
<td>5</td>
</tr>
<tr>
<td>Green</td>
<td>JSC &quot;Sinara - Transport Machines&quot;</td>
<td>RU000A103G00</td>
<td>10 000</td>
<td>5</td>
</tr>
<tr>
<td>Non-green</td>
<td>JSC &quot;Sinara - Transport Machines&quot;</td>
<td>RU000A1035D0</td>
<td>10 000</td>
<td>3</td>
</tr>
<tr>
<td>Green</td>
<td>JSC &quot;Sinara - Transport Machines&quot;</td>
<td>RU000A105M91</td>
<td>10 000</td>
<td>5,1</td>
</tr>
<tr>
<td>Green</td>
<td>PJSC &quot;Sberbank of Russia&quot;</td>
<td>RU000A103YM3</td>
<td>25 000</td>
<td>2</td>
</tr>
<tr>
<td>Non-green</td>
<td>PJSC &quot;Sberbank of Russia&quot;</td>
<td>RU000A102RS6</td>
<td>41 000</td>
<td>2,5</td>
</tr>
<tr>
<td></td>
<td>PJSC &quot;Sberbank of Russia&quot;</td>
<td>RU000A101C89</td>
<td>35 000</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>PJSC &quot;Sberbank of Russia&quot;</td>
<td>RU000A1025U5</td>
<td>40 000</td>
<td>3,1</td>
</tr>
<tr>
<td></td>
<td>PJSC &quot;Sberbank of Russia&quot;</td>
<td>RU000A102RQ0</td>
<td>15 000</td>
<td>2</td>
</tr>
<tr>
<td>Green</td>
<td>PJSC &quot;Sberbank of Russia&quot;</td>
<td>RU000A102CU4</td>
<td>18 000</td>
<td>3</td>
</tr>
<tr>
<td>Non-green</td>
<td>KAMAZ PTC</td>
<td>RU000A1043N3</td>
<td>2 000</td>
<td>2</td>
</tr>
<tr>
<td>Non-green</td>
<td>KAMAZ PTC</td>
<td>RU000A101SM9</td>
<td>3 000</td>
<td>3</td>
</tr>
<tr>
<td>Green</td>
<td>KAMAZ PTC</td>
<td>RU000A103DP0</td>
<td>5 000</td>
<td>2</td>
</tr>
<tr>
<td>Non-green</td>
<td>FPK &quot;Garant-Invest&quot;</td>
<td>RU000A102LS9</td>
<td>500</td>
<td>3</td>
</tr>
<tr>
<td>Non-green</td>
<td>FPK &quot;Garant-Invest&quot;</td>
<td>RU000A102DZ1</td>
<td>800</td>
<td>2</td>
</tr>
<tr>
<td>Green</td>
<td>FPK &quot;Garant-Invest&quot;</td>
<td>RU000A1016U4</td>
<td>500</td>
<td>3</td>
</tr>
<tr>
<td>Non-green</td>
<td>State Development Corporation &quot;VEB.RF&quot;</td>
<td>RU000A104Z48</td>
<td>50 000</td>
<td>5</td>
</tr>
<tr>
<td>Non-green</td>
<td>State Development Corporation &quot;VEB.RF&quot;</td>
<td>RU000A100GY1</td>
<td>20 000</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>State Development Corporation &quot;VEB.RF&quot;</td>
<td>RU000A101TB0</td>
<td>15 000</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>State Development Corporation &quot;VEB.RF&quot;</td>
<td>RU000A102FC5</td>
<td>25 000</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: Compiled by the authors.

The authors used the method of statistical observation, measurement and comparison. The authors attempted to apply the regression analysis method, but when processing the results, this method showed spurious regression.

### 3 Results

The visual results of the analysis are selectively presented in Figures 1-3. In terms of the yield of bonds not represented in Figures 1-3, the results from Table 1 are similar. The authors concluded that there is no negative yield premium for green bonds in the Sustainable Development Sector of the Moscow Exchange, as well as in terms of the yield of the Moscow Exchange Corporate Bond Index.
Fig. 1. Comparison of effective yields of green and classic bonds of PJSC Sberbank of Russia (a) and the Government of Moscow (b). Source: Compiled by the authors.

Fig. 2. Comparison of effective yields of green and classic bonds of KAMAZ PTC (a) and VEB.RF Development Group (b). Source: Compiled by the authors.
The results of the conducted research are as follows:
1. The hypothesis put forward by the authors is not confirmed.
2. To stimulate the green bond market, it is advisable to introduce tax incentives for coupon income and discount for individual investors (regarding personal income tax) and institutional investors (regarding corporate income tax).
3. It is necessary to evaluate the effectiveness of tax support for issuers and investors from the state's perspective.

4 Discussion

The hypothesis of lower yields on green bonds compared to classic bonds is not confirmed, likely due to two reasons:
- Limited sample of issuers, which can be explained by the insufficient development of green instruments in the Russian financial market.
- High volatility of the Russian securities market due to significant geopolitical risks.
- Possible existence of disparities and "errors" in emerging capital markets, including the Russian market.

Regarding the provision of tax incentives to investors in green bonds, we are guided by M. Miller's hypothesis [18], which suggests that tax incentives are already embedded in the price of the security itself. Thus, in the case of a negative yield spread on green bonds, it is possible to equalize the positions of "green" and "non-green" investors by granting the former tax incentives.

In addition to the obtained results, the authors identified problems in the development of the green bond market, namely:
- Uncertainty regarding whether green bonds truly contribute to addressing the environmental crisis.
- Investor demands for price parity with classic bonds.
- Frequent use of bonds for refinancing existing projects.
- The existence of "greenwashing" issues aimed at misleading investors.

5 Conclusion

The development of the article's topic seems logical in relation to the research on the profitability of green projects and the market capitalization of green issuers. It also includes an analysis of the impact of subsidizing coupon income for green bond issuers on the development of the green bond market. Furthermore, the study explores yield spreads on green bonds in advanced emerging securities markets, such as the Chinese market. Additionally, it delves into the analysis of green stock markets and shares of green investment funds.

References