

# Price Differences Between Labeled and Unlabeled Green Bonds

## The Rapid Growth of the Global Green Bond Market

Green bonds refer to bonds that finance investments that can mitigate the adverse effects of economic activity on climate change.<sup>8</sup> As such, they are financing instruments that can contribute greatly to funding the huge amounts of investments that are needed to build an environmentally sustainable world. Global green bond markets have grown rapidly since the first green bonds were issued by the European Investment Bank in 2007 and the World Bank in 2008. Indeed, green bond markets are one of the fastest-growing components of the global financial system.

Green bonds consist of labeled green bonds and unlabeled green bonds. The proceeds from issuing both types of bonds are used for climate-aligned projects and initiatives, but only labeled green bonds receive formal third-party certification. As such, they are generally regarded as being more credible in terms of their greenness. Bolton (2017) offers a more precise definition of the two types of bonds. Labeled green bonds are officially certified as complying with the Green Bond Principles (GBP), which are voluntary best practice guidelines established by a consortium of investment banks in 2014. The GBP are widely viewed as the gold standard of greenness certification. Unlabeled green bonds do not comply with GBP.

The Climate Bonds Initiative estimates that the amount of climate-aligned bonds outstanding worldwide surpassed USD1 trillion in December 2020.<sup>9</sup> Of this amount, labeled and unlabeled bonds accounted for USD240 billion and USD760 billion, respectively. Thus, labeled bonds comprise 24% of the climate-aligned bond universe and unlabeled bonds, which are generally less

investible although they also contribute to a low-carbon economy, comprise the remaining 76%.

As mentioned earlier, the green bond market is not only large, it is also fast-growing. Global green bond issuance more than doubled to USD228 billion during the first half of 2021 from USD92 billion during the first half of 2020, when issuance was notably impacted by the global spread of coronavirus disease (COVID-19).<sup>10</sup> The issuance total in the first 6 months of 2021 marked a record for a half-year period. The Climate Bonds Initiative forecasts that around USD500 billion will be issued during full-year 2021, which would be an annual record. Green bonds were initially issued primarily by advanced economies and select supranational institutions, but issuers now include 67 economies and multiple supranational institutions. Developing economies such as the People's Republic of China, which has the world's second-biggest green bond market after the United States, are now integral parts of the global market.

## Unlabeled versus Labeled Green Bonds

Most unlabeled bonds are issued by pure-play companies focusing on one particular type of business or industry, such as a manufacturer of solar panels or electric cars. While the proceeds of these companies may eventually be used to fund environmentally beneficial projects, proceeds could also be used for routine business activities such as daily operating expenses, management bonuses, or dividend payments. Such bonds are not labeled as green because they do not meet the GBP, which stipulate that the use of proceeds should be linked directly to specific environmental projects.

In addition, clean energy bonds that are used to finance new renewable energy projects with a quantifiable

<sup>8</sup> Suk Hyun, Donghyun Park, and Shu Tian. 2021. "Pricing of Green Labeling: A Comparison of Labeled and Unlabeled Green Bonds." *Finance Research Letters* 41 (2021). <https://doi.org/10.1016/j.frl.2020.101816>.

<sup>9</sup> See <https://www.climatebonds.net/2020/12/1trillion-mark-reached-global-cumulative-green-issuance-climate-bonds-data-intelligence>.

<sup>10</sup> See <https://www.climatebonds.net/resources/press-releases/2021/08/green-bonds-market-track-record-half-trillion-year-usd4961bn-issued>.

mitigation impact on greenhouse gas emissions are not equivalent to green bonds whose proceeds are used to maintain existing transportation or water infrastructure, or to finance a variety of climate projects with an unclearly defined environmental impact. Therefore, besides the issue of whether a bond is green or not, another fundamental issue is the validity of the green labeling. While a bond may be labeled as green, it may in fact be part of a portfolio for a company that produces coal energy and photovoltaic panels simultaneously.

Even in the presence of global standards such as the GBP, some economies have developed their own green bond guidelines. Since more economies are entering the global green bond market, the incompatibility of different national guidelines looms as a major problem. The overarching concern is that national or regional standards are less rigorous than international standards in their assessment of the greenness of a bond. This can reduce the credibility of labeling via national or regional standards relative to labeling via global standards. More broadly, rigorous third-party certification supported by well-defined and systematic evaluation of the environmental benefits of the investments financed by green bonds is vital for inspiring the confidence of investors in green bond markets.

## Price Differences Between Labeled and Unlabeled Green Bonds

Most existing studies that delve into the yields, and thus prices, of green bonds focus on yield differences between green bonds and conventional bonds with similar characteristics. This literature not only empirically analyzes the yield differences between green versus conventional bonds but also the determinants of yield differences. That is, these studies seek to answer the question of whether the yields of green bonds differ significantly from the yields of conventional bonds and if so, why? While this literature is valuable in that it helps to identify differences between green bonds and conventional bonds, it implicitly assumes that all green bonds are equal. But there is, in fact, a great deal of heterogeneity among green bonds. Put simply, some green bonds are greener than others.

In particular, some green bonds are labeled while others are not. Labels matter to investors because labeling reduces the environmental risk of green bonds. In

conventional bond markets, a credit rating signals the level of the issuer's credit risk. A good rating signals that the issuer's credit risk is low whereas a poor credit rating signals that the issuer's credit risk is high. By the same token, labeled green bonds have a lower environmental risk than unlabeled green bonds. This is because labeling requires third-party certification that is supported by external review of the greenness of the projects financed by the bond's proceeds. Such an external assessment reduces the information costs of investors, who can rely on the label rather than undertake costly due diligence. The label is thus a source of valuable information for investors.

Hyun, Park, and Tian (forthcoming) address the gap in the literature by empirically analyzing the yield and thus price differences between labeled and unlabeled green bonds. The study's basic premise is that the price that investors are willing to pay may differ between labeled and unlabeled green bonds because the former is more credible in terms of their greenness. Intuitively, green labels such as those certifying compliance with the GBP are valuable for investors because they lower information costs and environmental risks. The analysis of the study empirically confirms that investors value green labels and are willing to pay for them.

## Data, Methodology, and Empirical Results

Bloomberg Energy Finance (2015) classifies a bond as a green bond if the issuer (i) self-labels its bond as green or (ii) identifies the bond as oriented toward environmental sustainability objectives with clear statements about its commitment to use the proceeds for investments in compliance with the GBP. All proceeds must be used for green activities that are consistent with the GBP. Hyun, Park, and Tian (forthcoming) compiled Bloomberg data for 3,578 green bonds issued between January 2014 and December 2017. Of the green bond total, 282 were unlabeled and 3,296 were labeled. The GBP were launched in 2014, which is why that year was chosen as the beginning of the review period.

**Table 6** shows the key statistical features of labeled and unlabeled green bonds after propensity score matching, which refers to a statistical technique to construct an artificial control group by matching each treated unit (i.e., labeled green bond) with a nontreated

**Table 6: Summary Statistics of Labeled and Unlabeled Green Bonds**

| Variables    | Unlabeled Green Bonds | Labeled Green Bonds | t-value   |
|--------------|-----------------------|---------------------|-----------|
| Yield (bps)  | 3.359                 | 3.218               | 1.186     |
| Tenor        | 3.516                 | 3.565               | -2.713*** |
| Issue Amount | 6.024                 | 6.746               | -9.768*** |
| Liquidity    | 0.198                 | 0.253               | -1.443    |

**Notes:**

1. Yield is the yield to maturity in basis points (bps) of the bonds during the sample period.
2. Tenor is the logarithm of bond maturity measured in number of days on bond issuance.
3. Issuance amount is the logarithm of funds raised by each bond issuance (USD million).
4. Liquidity is the bid-ask spread for each green bond. \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: Hyun, Park, and Tian (forthcoming).

unit (i.e., green bond) with similar characteristics. The technique allows for a more accurate assessment of the impact of an intervention (i.e., labeling). Table 6 shows that relative to unlabeled green bonds, labeled green bonds are characterized by lower yields, longer tenors, larger issue amounts, and less liquidity.

**Table 7** reports the results of the econometric analysis of the impact of labeling on green bond yields. The analysis, which controls for factors other than green labels that affect yields, is based on matching a labeled green bond with an unlabeled green bond with similar characteristics. Models 1 and 2 refer to different ways of matching the two bonds. The results strongly confirm our conjecture that green labels have a visible effect on the yields of green bonds. More precisely, the yields of labeled green bonds are 24–36 basis points lower than the yields of unlabeled green bonds with similar attributes. The results are highly statistically significant at the 1% level and robustly consistent across both models. Bond yield is positively associated with tenor, issue amount, and liquidity.

## Conclusion

Green bonds are not a homogeneous asset class. In particular, labeled green bonds differ substantively from unlabeled green bonds. The former undergo external review and assessment to receive formal certification of greenness, such as compliance with the GBP, whereas the latter do not. From the investor's perspective, a green label is valuable because it lowers information costs and environmental risks. From the issuer's perspective, a green label reduces financing costs. In light of such theoretical effects, there is reason to believe that green labels have

**Table 7: Effects of Green Label on Green Bond Yield**

|                         | Model 1               | Model 2               |
|-------------------------|-----------------------|-----------------------|
| Green Label             | -0.240***<br>(-5.690) | -0.355***<br>(-4.941) |
| Tenor                   | 1.915***<br>(20.216)  | 2.066***<br>(10.408)  |
| Issue Amount            | 0.087***<br>(2.978)   | -0.070<br>(-0.988)    |
| Liquidity               | 0.618***<br>(12.006)  | 1.632***<br>(3.722)   |
| Adjusted R <sup>2</sup> | 0.43                  | 0.37                  |

**Notes:**

1. The dependent variable is the bid yield of a green bond.
2. Green label is a dummy variable indicating whether a green bond has a green label or not.
3. Tenor is the logarithm of bond maturity measured in number of days on bond issuance.
4. Issuance amount is the logarithm of funds raised by each bond issuance (USD million).
5. Liquidity is the bid-ask spread for each green bond. \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: Hyun, Park, and Tian (forthcoming).

an impact on the yields and hence pricing of green bonds. Hyun, Park, and Tian (forthcoming) empirically analyze this possibility. Their analysis strongly confirms a statistically significant effect of green labels on the yield of green bonds: the yields of labeled green bonds are 24–36 basis points lower than the yields of unlabeled green bonds with similar characteristics. The salient implication for policymakers is that it is helpful to introduce widely accepted international labels of greenness that benefit both investors and issuers. In addition, educating issuers about the benefits of green labels, along with guidance on obtaining them, would promote greater use of green labels.

## References

- Bloomberg Energy Finance. 2015. Guide to Green Bonds on the Bloomberg Terminal.
- Bolton, Ross. 2017. *Green Bonds: A Decade of Progress*. Boston: State Street Global Advisors.
- Hyun, Suk, Donghyun Park, and Shu Tian. Forthcoming. "Price of Green Labeling: A Comparison of Labeled and Unlabeled Green Bonds." *Finance Research Letters*.