

Sustainable bond investing

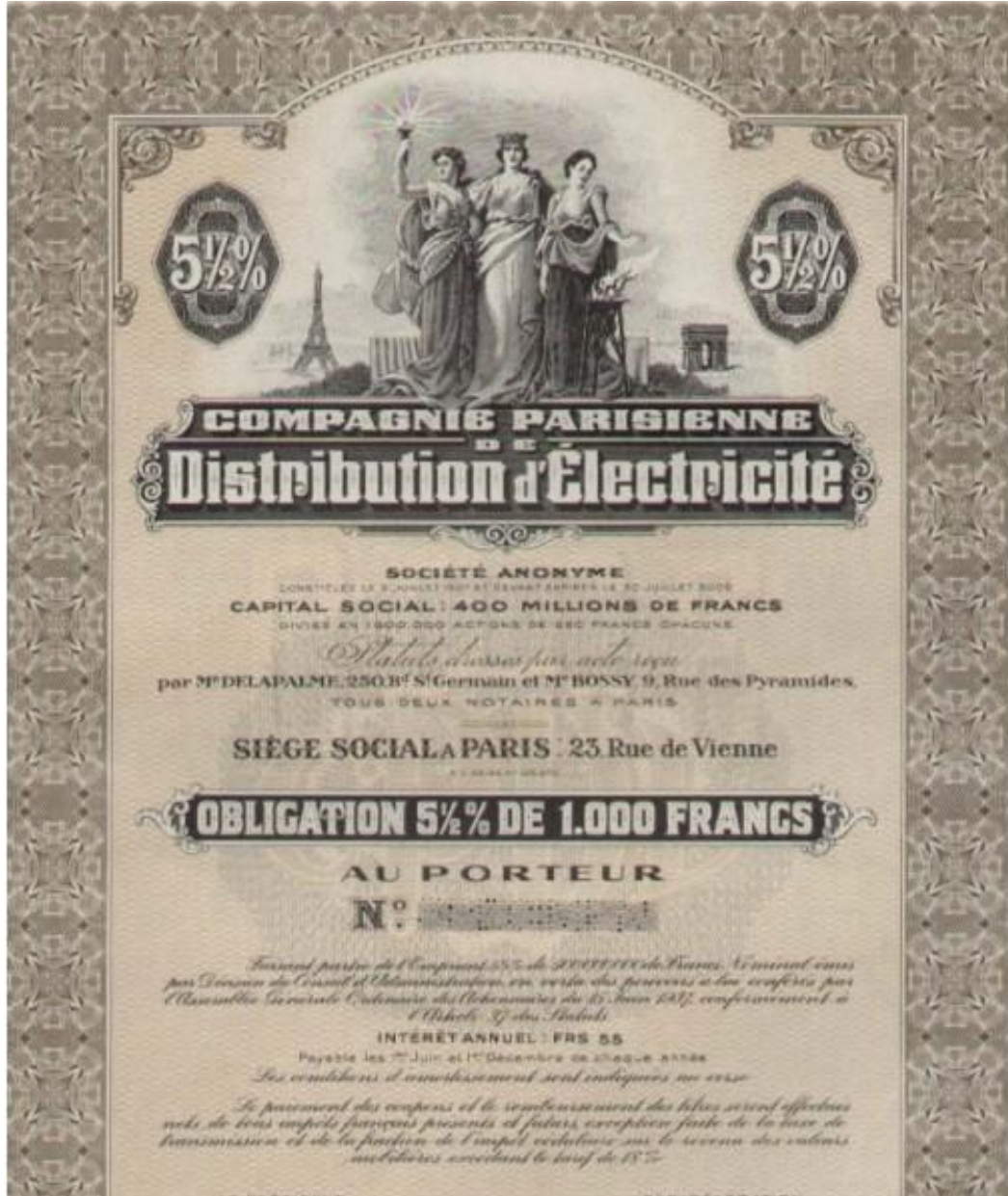
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Sustainable Multi-Asset Solutions

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Marketing materials for professional investors, not for onward distribution.

Overview of my presentation on sustainable bond investing



ABOUT ROBECO

INCENTIVES AND BOND MATURITY

LABELLED SUSTAINABLE BOND MARKETS

THE "GREENIUM"

IDEAS FOR WHAT (NOT) TO RESEARCH IN THE FUTURE

ROBECO – Rotterdam Investment Company

Colleagues passionate about investing

- 1929: Laying the Foundations >
- 1930s: Creating a global reach >
- 1940s: Emerging from war >
- 1950s: Making investing accessible >
- 1960s: Swinging ahead overseas >
- 1970s: From bonds to new businesses >
- 1980s: Turning turmoil into triumph >
- 1990s: Enter quant and sustainability >
- 2000s: New millennium, new milestones >
- 2013: Japan's ORIX buys Robeco >
- 2016: Fit for the future >

Emerging markets

Quant

Sustainability

Multi-asset

Fixed income

Four key takeaways from my talk

- > **Sustainable investing** requires **asset pricing** ('demand'), **corporate finance** ('supply'), and **context** ('practice')
- > Sustainable bonds markets are **large**, but currently only a **small** fraction of the total fixed income market
- > The **greenium** exists, but it is easy to understand why it is **small**
- > If you really want to understand new assets, **DO NOT** blindly apply fancy **econometric** techniques

Portfolio manager incentives to decarbonize and buy long-dated bonds

Takeaway #1: Incentives

- > Context: How are institutional investors in Europe required report the climate risk in their investment portfolio?

$$\text{CarbonFootprint}_{p,t} = \sum_{i=1}^N w_{i,t} \times \text{CarbonFootprint}_{i,t} = \sum_{i=1}^N w_{i,t} \times \frac{\text{Emissions}_{i,t}}{\text{EVIC}_{i,t}}$$

<https://doi.org/10.1108/MF-02-2023-0077>

- > Asset pricing: How do portfolio managers measure the market risk (beta) in their investment portfolios?

$$\text{MarketRisk}_{p,t} = \sum_{i=1}^N w_{i,t} \times \text{MarketRisk}_{i,t} = \sum_{i=1}^N w_{i,t} \times \text{dur}_{i,t} \times \text{CS}_{i,t}$$

<https://doi.org/10.3905/jpm.2007.674795>

- > How can you reduce carbon footprint, but keep carbon market risk the same as in the benchmark index?

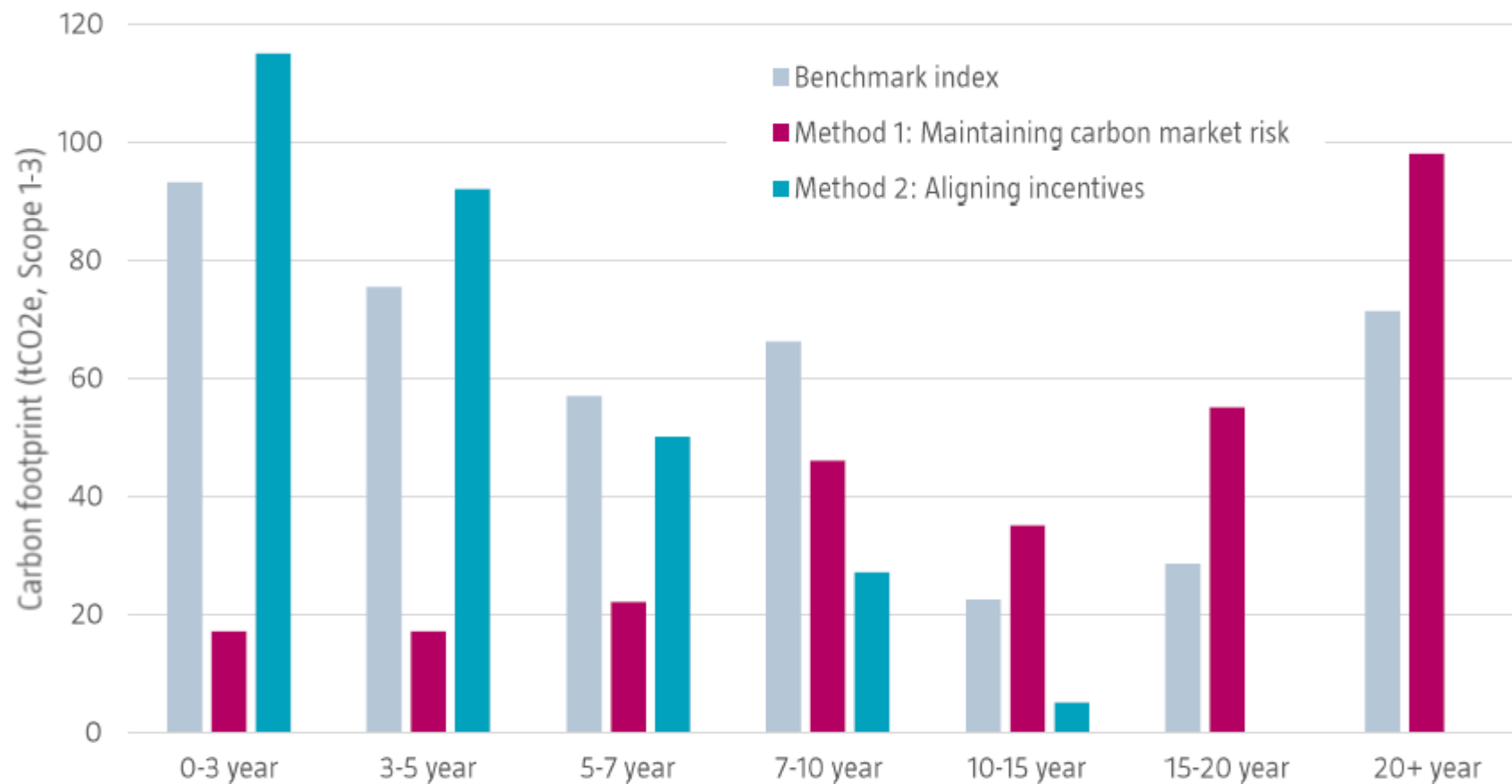
Half the portfolio weight (w) of large emitters and double the duration (dur)!

- > Corporate finance: What disciplines corporate management more, long-dated or short-dated financing?

High emitting companies can more easily obtain long-term financing!

Takeaway #1: Incentives

Figure 1 | Carbon footprint across maturity buckets for investment strategies



Source: Robeco, Bloomberg, Trucost. Stylized example. Displayed are the carbon footprints per maturity segment. Carbon footprint is defined to include Scopes 1, 2, and 3. Total benchmark carbon footprint is 414. Both of the two other strategies have a carbon footprint of 290, which is 30% less than the benchmark. The difference is the bond maturity associated with the carbon footprint.

Table 1 | Impact of investment policy on fixed income investors and debt-issuing companies

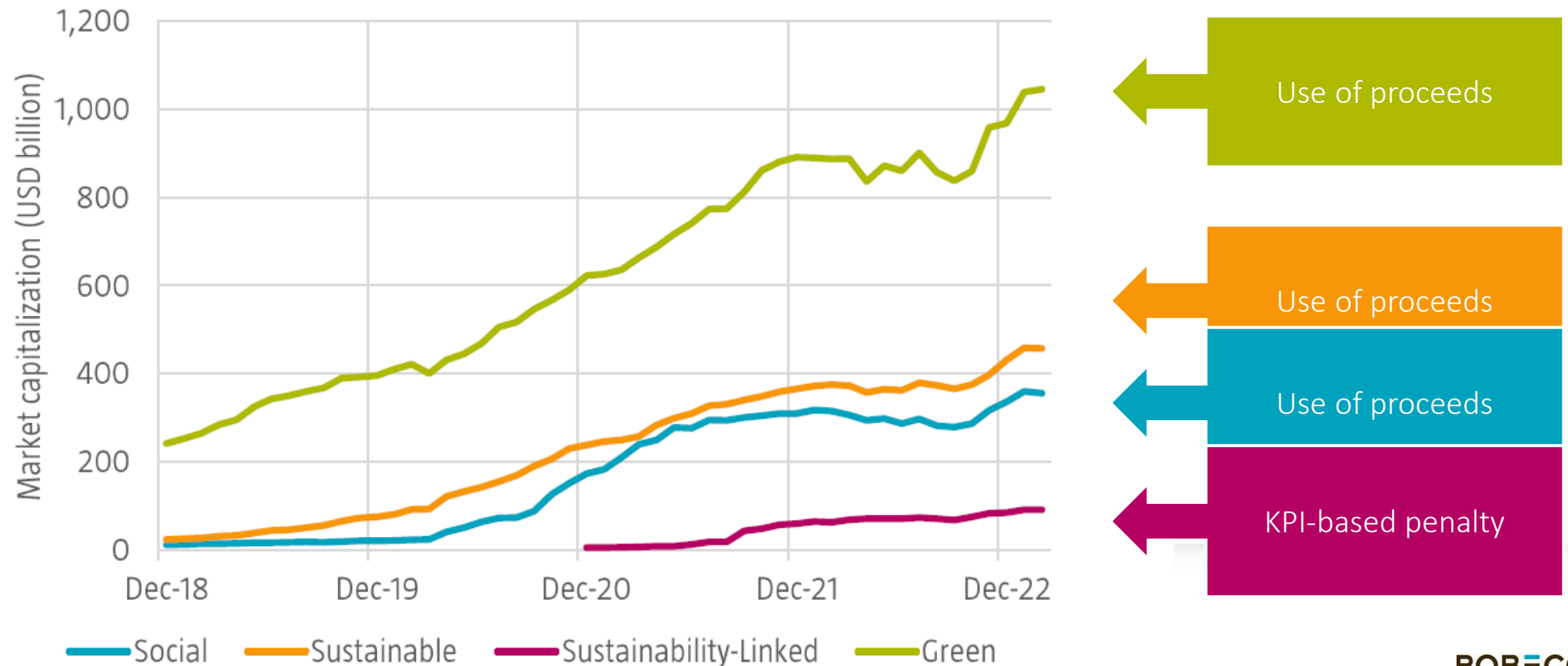
Investment policy for high emitters with a credible plan		Divest	Long-term financing	Short-term financing
Impact on fixed income investor	Risk versus benchmark	High	Low	Medium
	Stranded asset risk	Low	High	Low
Impact on debt issuing company	Incentive to remain Paris aligned	Low	Medium	High
	Cost of capital	High	Medium	Medium

Source: Robeco

Because bonds mature, fixed income investors have lots of power to influence the company

- > Global fixed income market size: USD 57,295 billion, so sustainable bonds < 3.5% of total fixed income market
- > Number of bonds in the index Green ~1500, Sustainable ~500, Social ~300, Sustainability-linked ~200

Figure 1: Development of social, sustainability, and sustainability-linked bond markets



Who issues the bonds? Social bonds are mostly government-related issuers!

Takeaway #2: Market

Figure 2: Industry composition of the social bond market

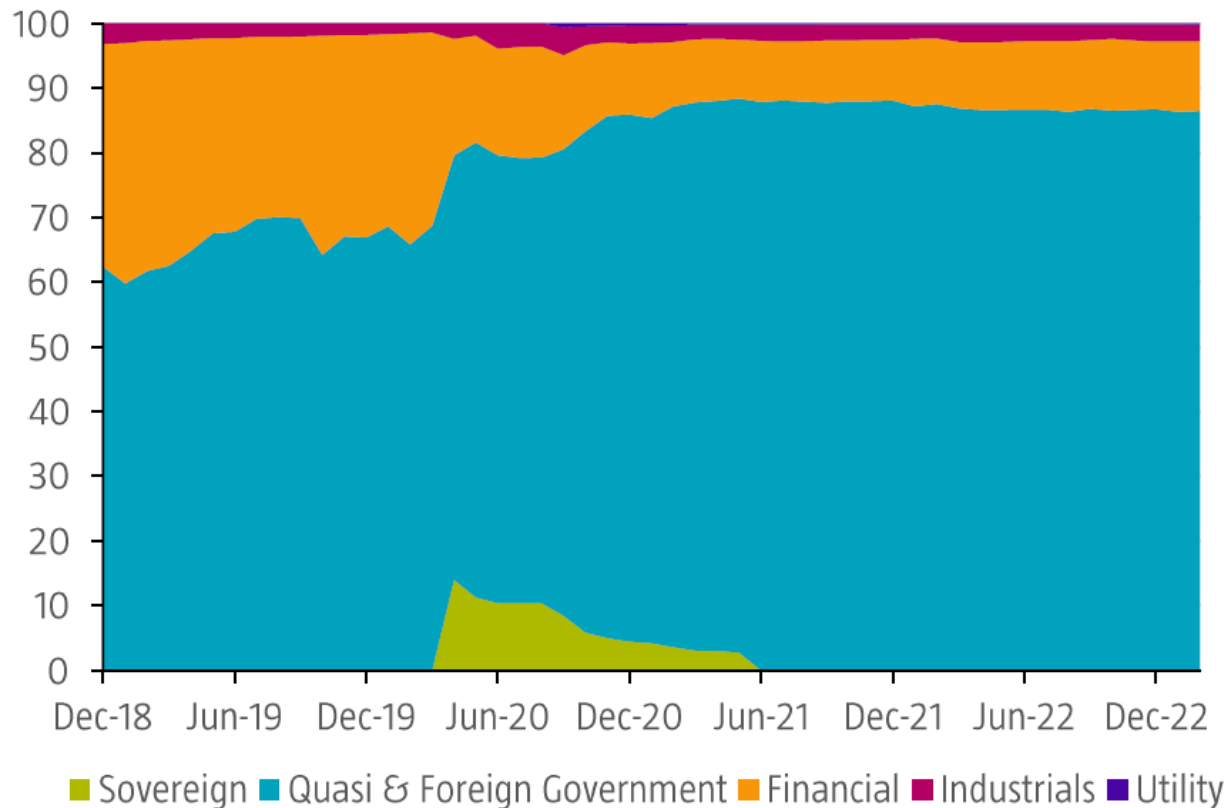
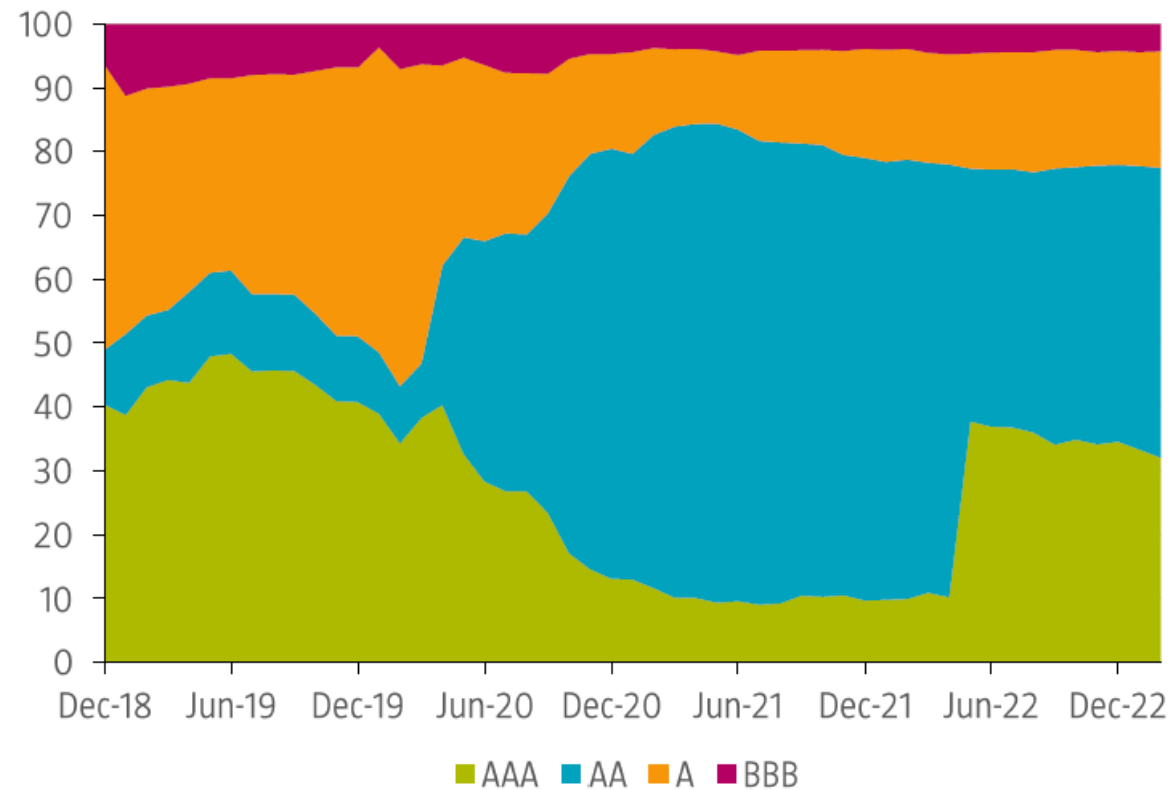


Figure 3: Rating composition of the social bond market



Who issues bonds? Sustainability-linked bonds are mostly corporate issuers!

Takeaway #2: Market

Figure 10: Industry composition of the sustainability-linked bond market

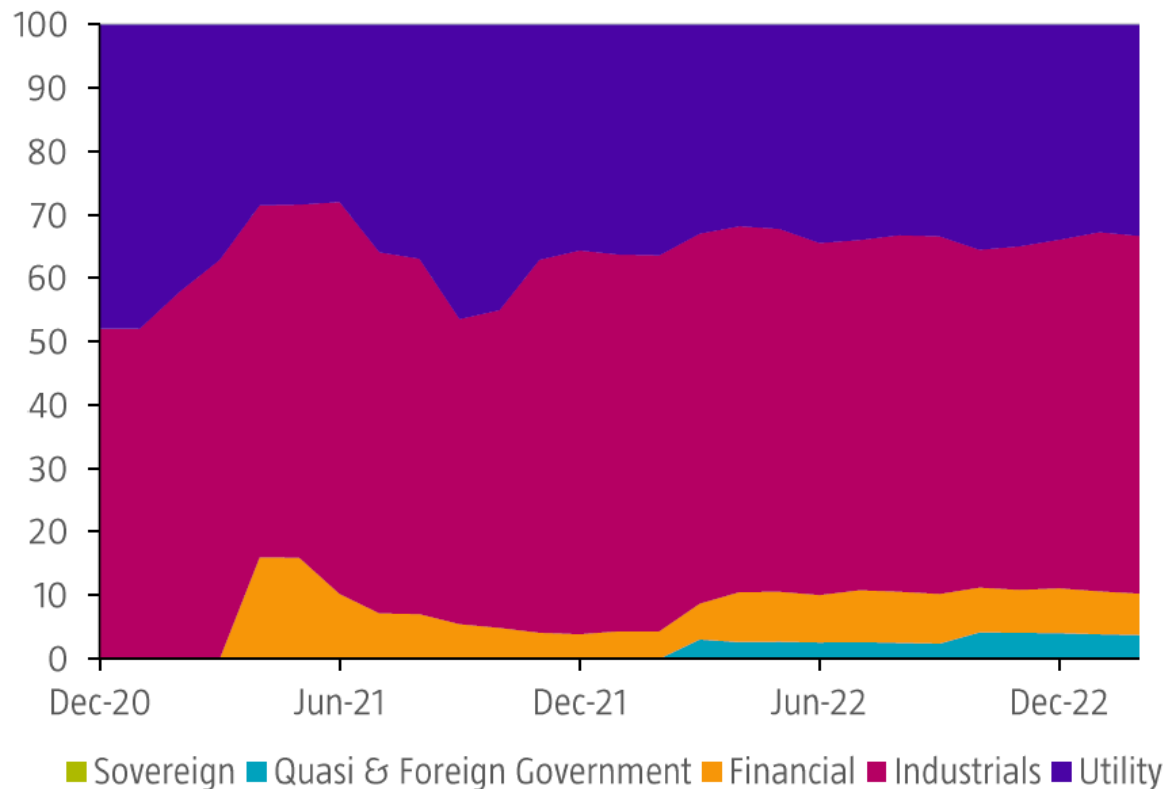
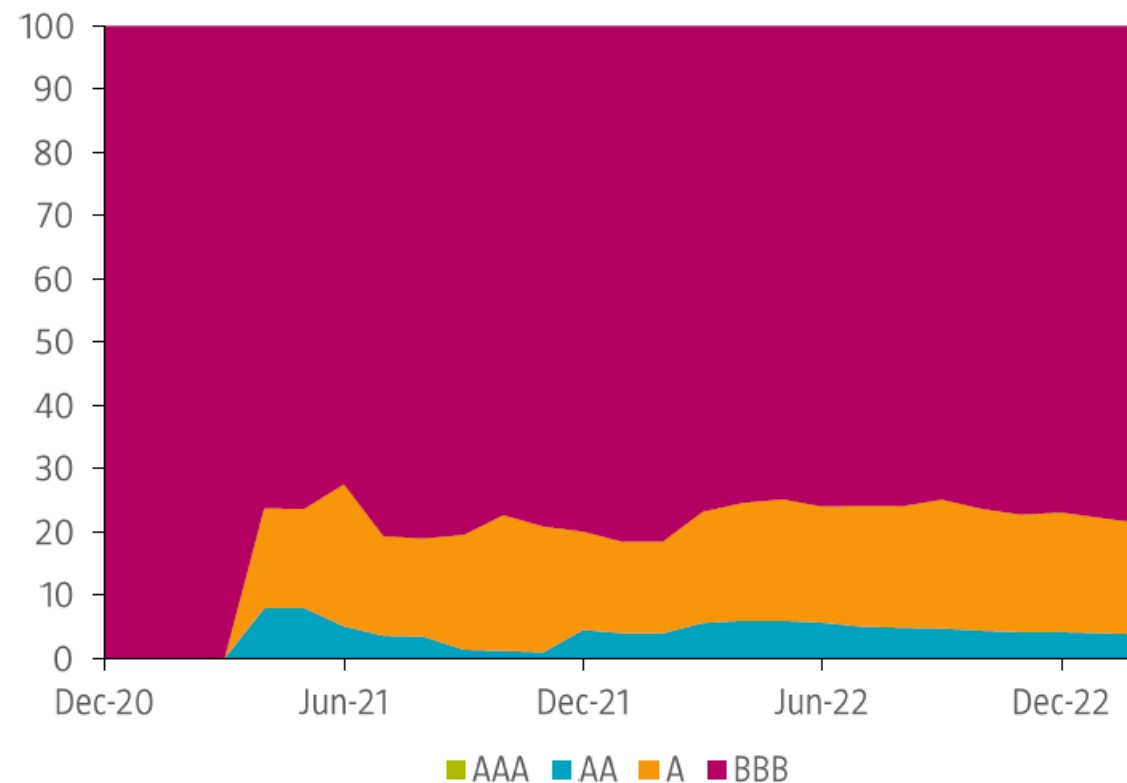


Figure 11: Rating composition of the sustainability-linked bond market

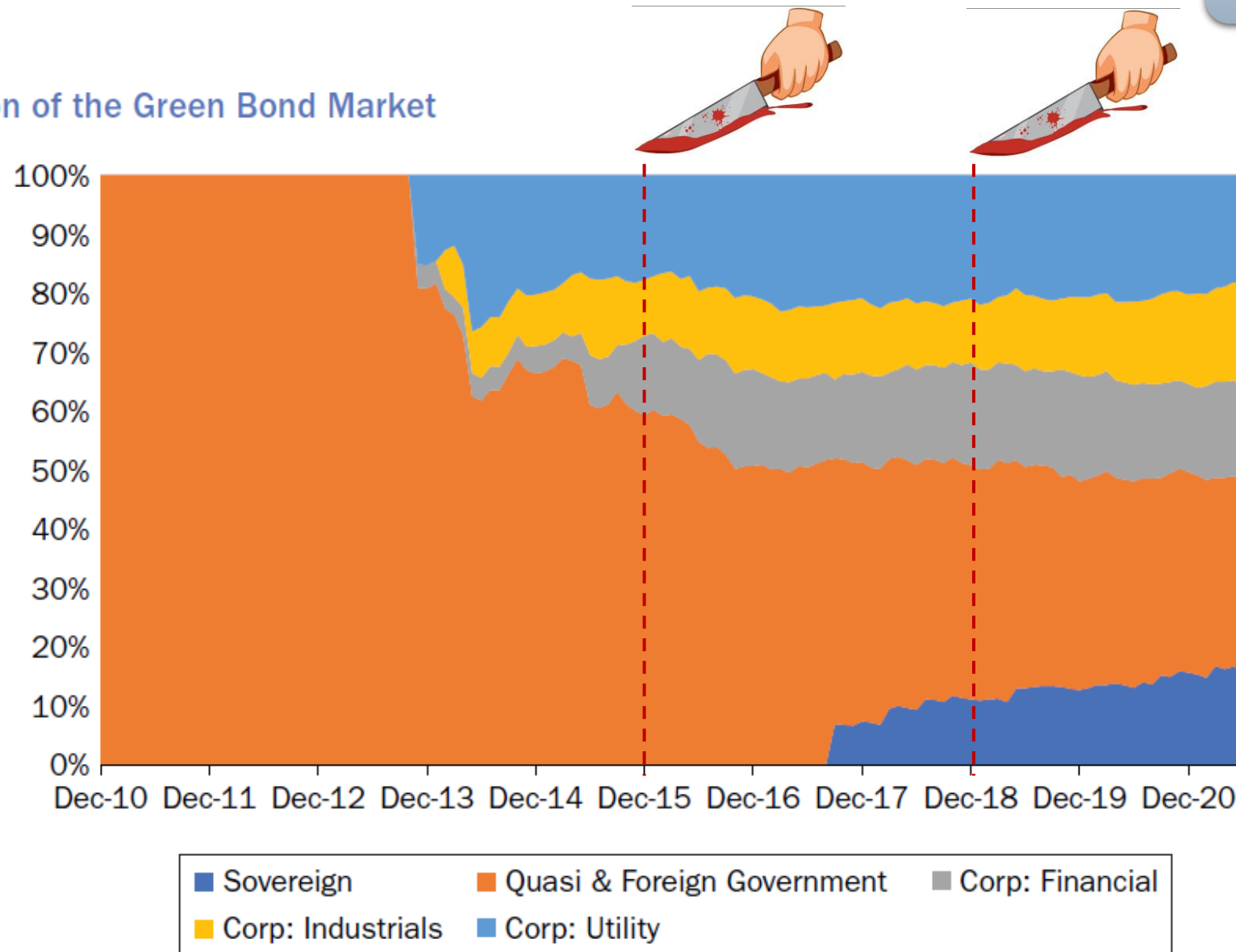


Source: Robeco, ICE. Level 2 industry classification. Index name: ICE FX-G10 Sustainability-Linked Bond Index. Index code: SLBF. Sample period 31 December 2020 to February 2023.

Is using more data better? The evolution of the green bond market

Takeaway #2: Market

Sector Composition of the Green Bond Market

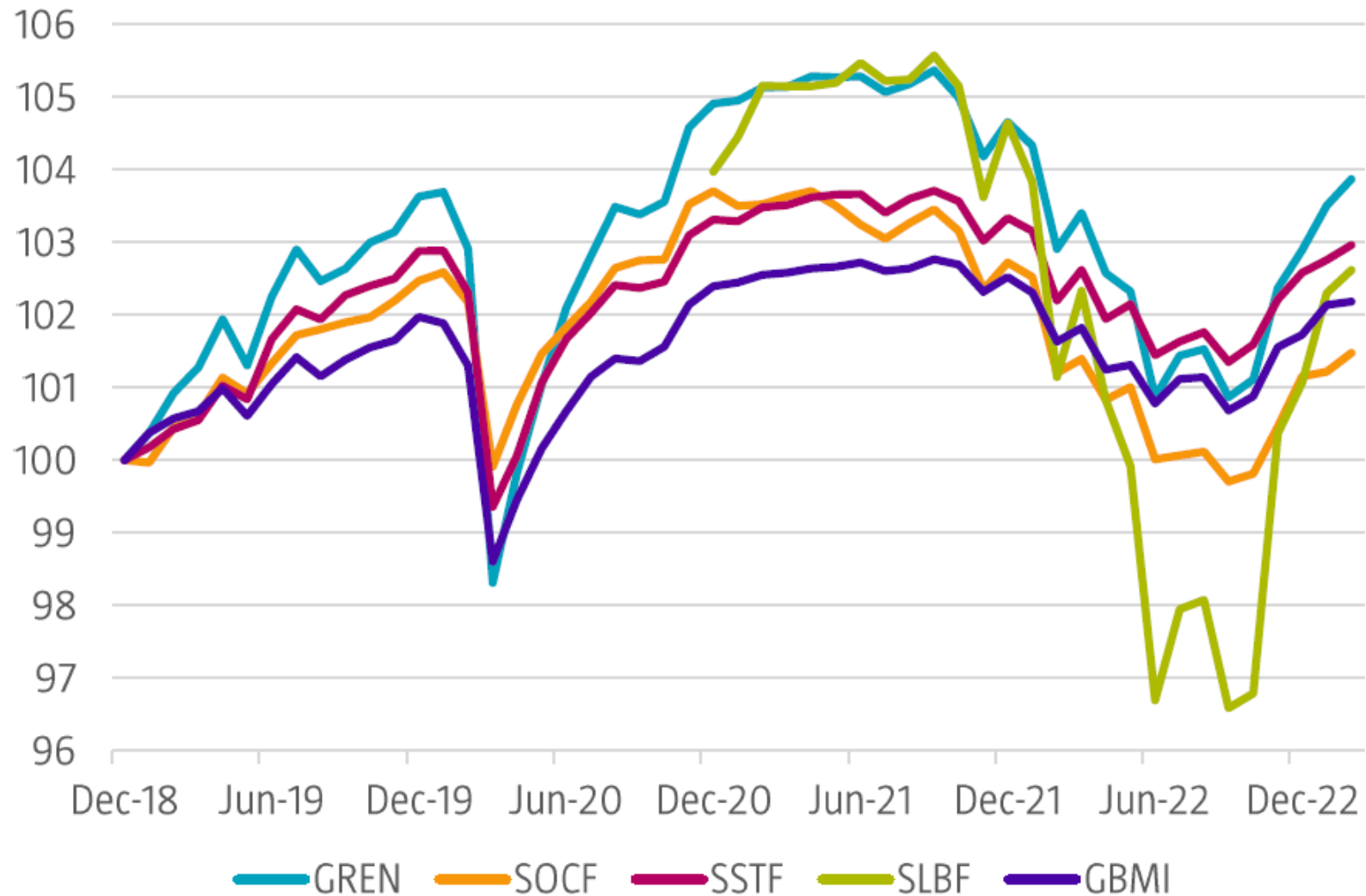


SOURCE: ICE BofA Green Bond Index. Index code: GREN. Sample period: December 31, 2010, to July 31, 2021.

“Sustainability-linked bonds have more downside risk than conventional bonds”



Figure 15: Excess credit returns of ESG bonds and conventional bond market



What is the greenium?

Takeaway #3: Greenium is small

- > The **green** (prem)**ium** is the difference in yield between a green bond and a **similar** but not green conventional bond
- > What determines the price of a bond?
 - > Counterparty (and seniority) risk: What is the expected loss due to default?
 - > Maturity: How long does it take before the investors gets the cash flows from the bond?
 - > Market risk: What is the appropriate credit market risk premium?
 - > Greenness of the bond: **WHERE?? HOW??**

$$Price_0 = \sum_{t=1}^T \frac{Coupon_t}{(1 + R_t)^t} + \frac{Principal_T}{(1 + R_T)^T}$$

- > Ideal candidate to determine the **greenium**: Same issuer, same maturity, same coupon, same size, same seniority!
- > NB: Green bonds are not paid back from revenues from green projects, but pari-passu with conventional bonds

Evidence on the greenium by German 'twin bonds'

Takeaway #3: Greenium is small

The price of being green

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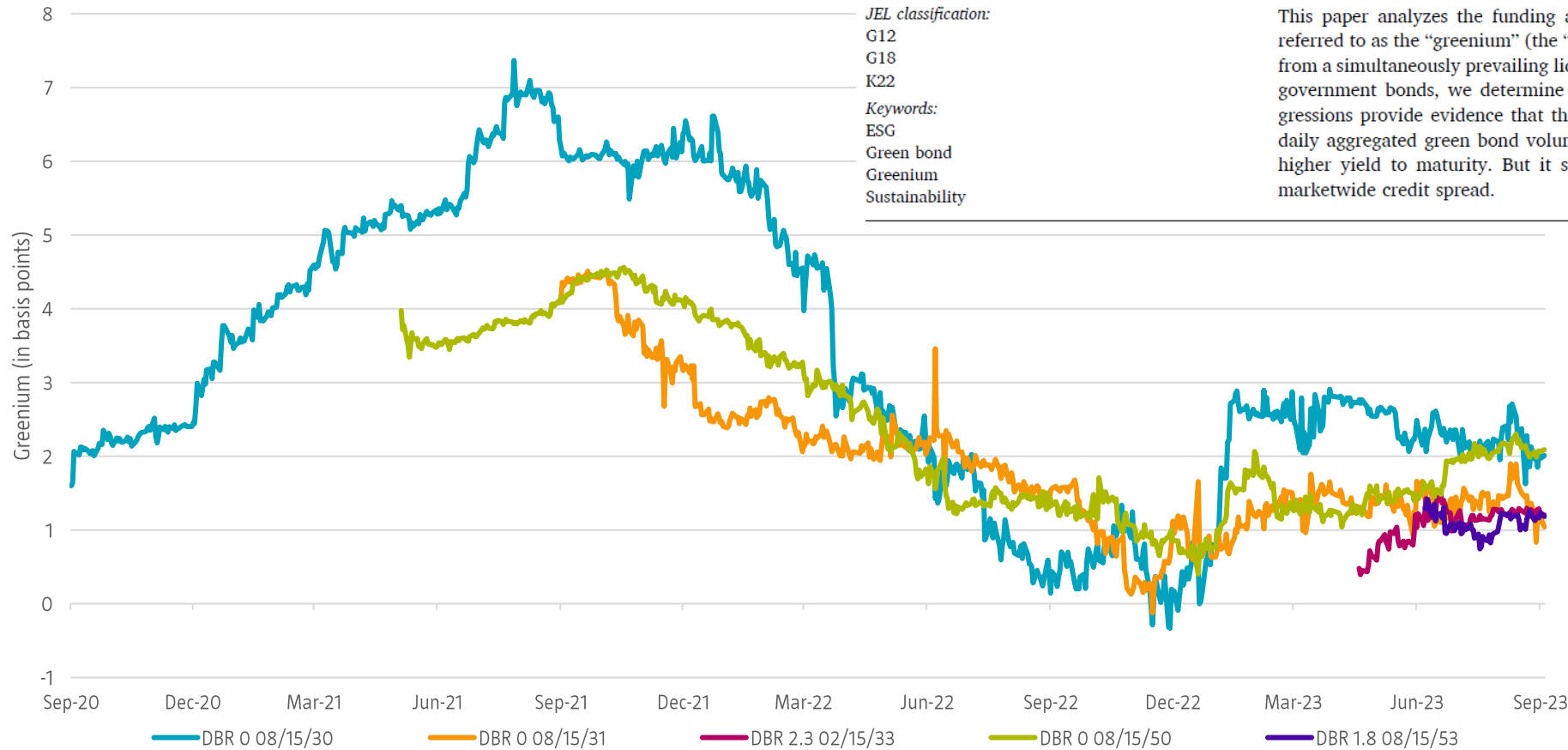
Green bond

Greenium

Sustainability

ABSTRACT

This paper analyzes the funding advantage of green bonds and the determinants of what is referred to as the "greenium" (the "green" premium). To this end, we first separate the greenium from a simultaneously prevailing liquidity premium in empirical yield spreads. For green German government bonds, we determine a greenium of 68.0 to 81.2 basis points. Further panel regressions provide evidence that the greenium is positively related to market awareness (such as daily aggregated green bond volume, higher yield to maturity. But it suffers from a negative relationship as measured by the marketwide credit spread.



The greenium is small (and perhaps over-researched)

Takeaway #3: Greenium is small

- > Yes, 'sustainability taste' (or implicit market segmentation) can affect market prices. Question is how much is realistic.
 - > Pastor, Stambaugh & Taylor (2021), Pedersen, Fitzgibbons & Pomorski (2021), Zerbib (2022), Cornell (2021) and more...
- > What is a good comparable bond to measure the greenium?
 - > Suppose issuance of a green bond is a commitment signal from the company to reduce climate change risk
 - > Suppose investors in aggregate expect that less climate risk increases expected cashflows or reduces systematic risk
 - > Both the **GREEN AND CONVENTIONAL** bond of the same company see the yield go down by about the same amount
 - > The greenium may be better defined compared to a very similar company that did not issue a green bond
- > The best researched “<10 basis points” ever!
 - > Hachenberg & Schiereck (2018), Zerbib (2019), Tang & Zhang (2020), Larcker & Watts (2020), Partridge & Medda (2020), Deng, Tang, & Zhang (2020), Bhanot, Combs, & Patel (2022), Jabłocki (2023), Benincasa, Fu, Mishra & Paranjape (2023), etcetera...
 - > The greenium is even smaller when the green bond smells like greenwashing (as market participants are not totally crazy)

Robeco selection process: Green bond eligibility

In-house Green bond analysis framework to ensure bonds adhere to internationally accepted principles



1. Eligibility – Green bond framework in line with green bond principles

- > Review of the issuer's Green Bond Framework and verification by external party (ex-ante), if available



2. Allocation of proceeds – project evaluation

- > Contribution to environmental objectives, eligible with EU Taxonomy on environmental sustainability



3. Impact reporting – lower carbon footprint

- > At least annually, the issuer needs to report on the use of proceeds and the contribution to the environmental objective. Best practice is for this impact report to be externally audited (ex-post)



4. Environmental strategy

- > Assessment of the wider strategy of the company, country or government related entity



5. Conduct – Adherence to international norms

- > Social safeguards (International Human and Labor Rights), Controversial behavior (UN Global Compact not violated), Sanctions linked to exclusion lists



Sustainable bonds are regular bonds (except < 10 bp)



Energy Economics
Volume 88, May 2020

Takeaway #4: Aim to understand

Publish fancy **econometric** techniques, but learn anything????



Energy Economics
Volume 86, February 2020, 104629



Network connectedness of green bonds and asset classes



Journal of Cleaner Production
Volume 292, 10 April 2021, 125988



Are green bonds a different asset class? Evidence from time-frequency connectedness analysis



Economic Modelling
Volume 88, June 2020, Pages 25-38



Price connectedness between green bond and financial markets



Energy Economics
Volume 92, October 2020, 104941



Finance Research Letters
Volume 40, May 2021, 101739



Relationship between green bonds and financial and environmental variables: A novel time-varying causality

Time-frequency comovement among green bonds, stocks, commodities, clean energy, and conventional bonds

Are green bonds environmentally friendly and good performing assets? ☆



Journal of Environmental Management
Volume 305, 1 March 2022, 114358



Green bonds and other assets: Evidence from extreme risk transmission



Journal of Cleaner Production
Volume 314, 10 September 2021, 128100



Areas for future research in this field focus on real-world impact

Takeaway #4: Aim to understand

- > Quantify the **real-world** impact of sustainable investing (exclusions, engagement, decarbonization, etc...)
- > Design new financial instruments that improve **real-world** outcomes even more
- > Design policies that improves **real-world** outcomes even more
- > Determine the main **obstructions** for effective climate policies and find mechanisms that **solve** these
- > Gather new or better sustainability **DATA** to better inform the sustainability investing debate

Today's presentation:

- > Swinkels (2022) Allocating to Green Bonds. [Journal of Alternative Investments](#) or [SSRN Working Paper](#).
- > Beteta Vejarano and Swinkels (2023) Social, Sustainability, and Sustainability-Linked Bonds. *J. Impact and ESG Investing* or [SSRN Working Paper](#).
- > Koekkoek and Swinkels (2023) Increasing incentives to decrease carbon emissions in corporate bonds. [Robeco Web Article](#). Full note upon request.

My other recent sustainability investing research:

- > Van Zanten, Swinkels, Scholten and Schieler (2023) Integrating the Sustainable Development Goals in Government Bond Investment Strategies. [SSRN Working Paper](#).
- > Markwat and Swinkels (2023) Corporate Carbon Emissions Data for Equity and Bond Portfolios. [Managerial Finance](#) or [SSRN Working Paper](#).
- > Swinkels (2023) Trading Carbon Credit Tokens on the Blockchain. [SSRN Working Paper](#).
- > Swinkels and Yang (2022). Investing in Carbon Credits. [Journal of Alternative Investments](#) or [SSRN Working Paper](#).
- > Blitz and Swinkels (2021). Does Excluding Sin Stocks Cost Performance? [J. of Sustainable Finance and Investments](#) or [SSRN Working Paper](#).
- > Blitz and Swinkels (2021). Who owns tobacco stocks? [Journal of Asset Management](#) or [SSRN Working Paper](#).
- > Blitz, Swinkels, and Van Zanten (2021). Does Sustainable Investing Deprive Unsustainable Firms from Fresh Capital? [Journal of Impact and ESG Investing](#) or [SSRN Working Paper](#).
- > Blitz and Swinkels (2020). Do Tobacco Share Owners Finance the Tobacco Business? [Journal of Impact and ESG Investing](#) or [SSRN Working Paper](#).
- > Blitz and Swinkels (2020). Is Exclusion Effective? [Journal of Portfolio Management](#) or [SSRN Working Paper](#).



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