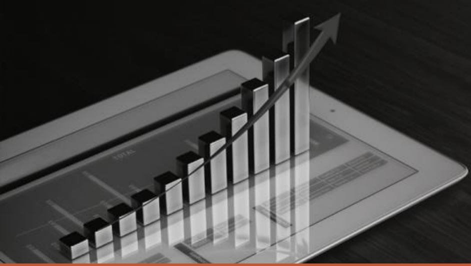

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Green bond indices versus the overall market – what are the performance drivers?

"Green bonds perform better than comparable bonds without a sustainability character." This generalised thesis is heard time and again on the bond market and we have systematically investigated this statement. In doing so, we have gained interesting insights that both confirm and refute it. Due to structural differences between the two bond segments, it simply depends on the timing and the market phase.

We look at the structural differences between a green bond index and the overall market, and show in which market phases the respective index performs better or worse. The aim of this article is to give the reader a concise overview of the past and possible future performance drivers of green bonds.

Green index is an carve out from the overall corporate bond market

At first glance, the two indices are similar in terms of their key performance indicators: Table 1 compares the ICE Euro Corporate Green Bond Index (hereinafter referred to as the "green" index) and the ICE BofA Euro Corporate Bond Index ("overall market"). The overall market also includes all bonds from the green index, whose share as of 30 September 2023 was c13%.

Tab. 1: A comparison of the key figures of both indices

Green index is more susceptible in times of stress, partly due to lower credit rating and higher credit spread sensitivity

		ICE Euro Corporate Green Bond Index ("Green Index")	ICE BofA Euro Corporate Index ("Overall Market")	pct. / abs. change
Number of Bonds		592	4.158	-85,8%
Nominal	EUR bn	385	3.012	-87,2%
Yield to Maturity	in %	4,3	4,3	0,1
Modified Duration	in %	4,7	4,5	0,3
Maturity	in years	5,4	5,1	0,3
Spread Duration	in %	5,1	4,8	0,3
Spread vs. German Bunds	in basispoints	165	155	10,0
Asset Swap Spread	in basispoints	96	87	9,0
Ø-Rating		Baa1 / BBB+	A3 / A-	+ 1 Notch

Source: ICE, Berenberg, As of: 30/09/2023

Differences at the top index level

The green index reacts more sensitively than the overall market due to changing market parameters

In a risk-averse market environment, a weaker performance in the green bond index compared to the overall market may result from the higher sensitivity to changes in spreads[1]. In such a stress phase, there could be partial offsetting effects on performance if risk-free interest rates fall at the same time (see higher modified duration[2]). In a risk-free market environment, on the other hand, the green index would benefit more from falling risk premiums than the market as a whole, due to the higher spread duration even if rising risk-free interest rates could reduce this additional income at

[1] A (credit) spread is the creditworthiness-related yield premium of a corporate bond compared to risk-free securities (eg German government bonds).

[2] Duration refers to the sensitivity of a bond. Bonds react both to changes in risk-free interest rates (key figure: modified duration) and to changes in credit risk premiums (spread duration). The duration measures by how many percentage points the bond price changes when the respective parameter (interest rate or credit risk premium) changes by 1ppt.

the same time. However, the performance comparison in this article shows that this described (classic) interaction between risk-free interest rates and credit spreads has no longer been the rule in recent quarters.

Consequently, a capital market environment of falling risk-free interest rates and falling spreads, as was the case during the extensive monetary policy intervention in the first half of 2020 in response to the consequences of the coronavirus pandemic, is particularly positive for the relative performance of the green index.

The green index has a worse average credit rating than the overall market

Despite a lower average rating and higher interest rate and spread sensitivity, the yield premium of the green index is marginal at 0.1% compared to the overall market. This seems to be due to the still limited supply of green bonds. The green bond market generally appears to be valued higher than the total market.

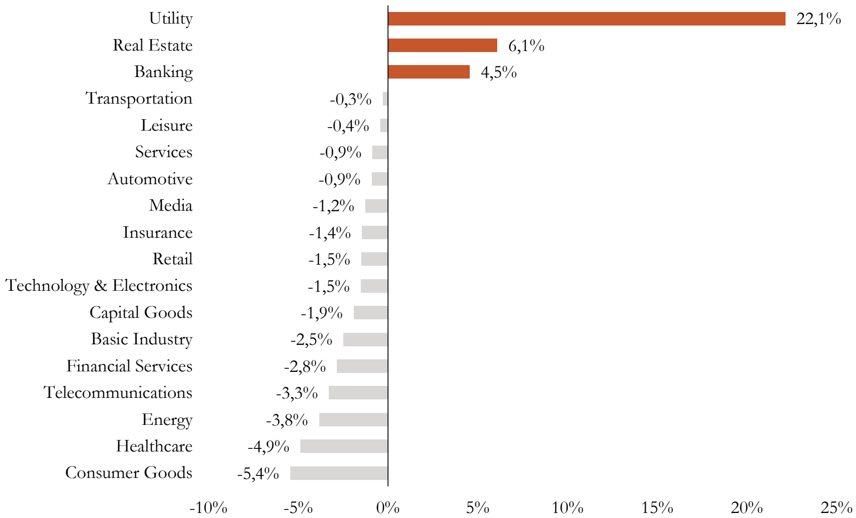
Issuer universe in the green index is more condensed and concentrated

The high concentration of individual issuers in the green index is also striking. The top 10 issuers account for around a quarter of the outstanding issue volume, but only just under a tenth in the overall market. While the weighting of the largest issuers in the overall market is well below 2.5% in each case, issuer weightings of up to 4.3% occur in the green index. Due to the lower diversification, the green index is therefore more susceptible to individual credit risks and any associated spread movements.

Differences in the sector structure

As of 30 September 2023, there is a strong sector concentration in the green index, as shown in Figure 1, in utilities (22ppt overweight compared to the overall market), real estate (6ppt) and banks (5ppt). These three sectors account for more than 75% of the index and therefore have a significant influence on the overall performance of the green index.

Fig. 1: Differences in the sector structure (green index versus overall market) emphasise low diversification



Source: ICE, Berenberg, As of: 30/09/2023

In 2022, for example, the higher share of the real estate sector had a negative impact. The business model of real estate companies has come under pressure due to the rise in interest rates and the associated higher refinancing costs.

The green index is also partially underweighted in defensive (and anti-cyclical) sectors such as consumer goods (5ppt), healthcare (5ppt) and telecoms (3ppt) compared to the market as a whole. This is due to the limited supply of green bonds from these sectors. For example, issuers from the consumer goods sector with strong credit ratings and a prominent presence in the overall market, such as Nestlé and Unilever, are completely absent from the green index. These issuers may not necessarily be dependent on the additional demand effect from green bonds due to their good credit rating.

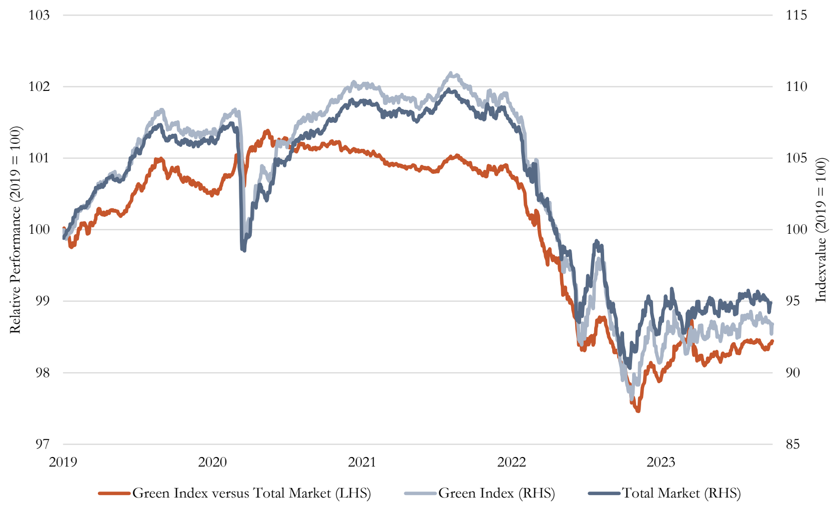
Some heavyweights from the overall market are completely absent from the green index

Performance comparison: it's all about timing

Let us now take a closer look at the relative performance of the two bond markets. Figure 2 shows the performance of green bonds compared to the overall market. It is noticeable that the "outperformance" of the green index in 2019 and 2020 declined noticeably from the first half of 2021. Since the first quarter of 2022, the picture has even changed to a clear underperformance of the green index compared to the overall market.

After slightly outperforming in 2019 and 2020, green bonds significantly underperformed the overall market in 2021 and 2022

Fig. 2: Better performance of green bonds over a longer period of time not proven



Source: ICE, Berenberg As of: 30/09/2023

In our opinion, the outperformance (full year 2019: 50bp) of the green index from the first quarter of 2019 can be explained by the increased demand for green bonds from the growing segment of sustainable investment funds and institutional investors. This was further reinforced by the limited availability of issuance. In March 2019, for example, the green index had an extremely small investment universe with just 114 issues.

The year 2020 was significantly influenced by the outbreak of the coronavirus pandemic. The courageous intervention of the central banks in March 2020 immediately led to falling interest rates and risk premiums, and was particularly favourable for the green index in the first half of 2020 due to its higher interest rate and spread duration (full year 2020: 60bp). At the same time, increasingly intensive discussions about

Excess demand and short supply leads to outperformance of green bonds in 2019 green bonds on the investor side also supported market demand, which in turn met with a good supply of new issues.

New interest rate environment and declining risk appetite weighed on green bonds in 2022

The relative performance of the green index then declined noticeably in the second half of 2021. From March 2022 at the latest, the general conditions for the green index deteriorated further as a result of the war in Ukraine, significantly rising inflation rates and a looming departure from the ultra-expansive monetary policy. Interest rate movements of historic proportions, increased market volatility and, in some cases, significant widening of risk premiums were the main drivers of the underperformance of the green index during this period (full year 2022: -240bp). Overweights in sectors from interest rate-sensitive sectors and/or with negative sector sentiment (especially real estate and utilities as a result of the energy crisis in Europe) added further ballast.

Favourable market environment for green bonds until the end of the third quarter of 2023

The situation has now stabilised and green bonds have outperformed the market as a whole in 2023 to date (by around 60bp). Bonds with a credit risk component (ie spread component) have been very popular since the start of 2023 and continue to be in high demand. Spreads on corporate bonds have been falling across all market segments since the start of the year, which has had a positive effect on bond prices. The effect is amplified for the green index due to its higher sensitivity to changes in spreads compared to the market as a whole.

In addition to the general performance analysis, we have broken down the performance of the two bond indices into a risk-free component and a credit component in order to analyse the two market factors separately.

The two charts work as follows: positive values in the chart show a better performance of the green index compared to the overall market, and negative values show an opposite movement.

Risk-free interest component burdens the green index for the full year 2022

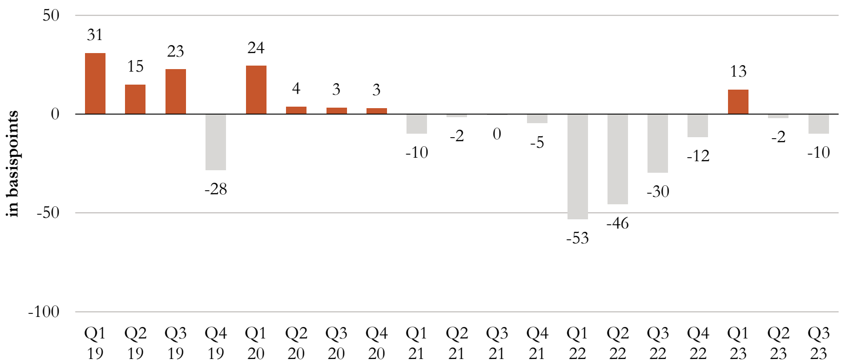
As shown in Figure 3, the higher interest rate duration with declining risk-free market interest rates resulted in an additional return for the green index compared to the overall market in 2019 and 2020. In 2021, the change in risk-free interest rates proved to be a negative factor for the performance of the green index compared to the overall market. However, the full year 2022 is particularly striking: the relative performance of green bonds suffered from rising risk-free interest rates, with a decreasing magnitude from quarter to quarter. In the year to date, the change in risk-free interest rates has resulted in a slightly negative contribution for green bonds. Overall, however, this recovery in value has not yet been sufficient to even come close to offsetting the underperformance from 2022.

Green index would benefit disproportionately to the overall market from interest rate cuts

With the higher interest rate duration compared to the overall market, the green index is predestined to outperform due to falling risk-free interest rates in the medium term. The ECB appears to have reached the end or almost the end of its interest rate hike cycle. Based on current market expectations, bond investors are looking forward to a more favourable bond market environment next year. In such an environment, the green index could benefit disproportionately to the overall market from interest rate cuts. However, due to the high level of inflation uncertainty, there is still a risk that investors' market expectations will not be realised.

Fig. 3: Rise in risk-free interest rates weighs on green index, especially in 2022

Difference in the performance of the risk-free component (government bonds) of EUR IG Corporate Green Bonds compared with EUR IG Corporates as a wholeSource: ICE, Berenberg, As of: 30/09/2023



Positive relative value contribution from the credit component of green bonds since the beginning of 2023

The relative performance between the green index and the overall market from the credit component follows the intra-year pattern from the risk-free interest rates in most quarters of the period under review (Fig. 4). Positive outliers for the green index are the first two quarters of 2020 and the current year. In the former period, the central banks' support measures in response to the coronavirus pandemic led to a rapid recovery in market sentiment. In contrast, the year to date has been characterised by investor-driven risk appetite.

Ukraine war and dampened risk appetite weighed disproportionately on green bonds in 2022

This contrasts with a significant underperformance for green bonds in 2022 (and especially in the first half of the year) as a result of the credit component. The outbreak of the war in Ukraine resulted in a general deterioration in investor risk appetite. As a result, the credit spreads of corporate bonds increased significantly. For the green index, this development was further intensified by the higher sensitivity compared to the overall market.

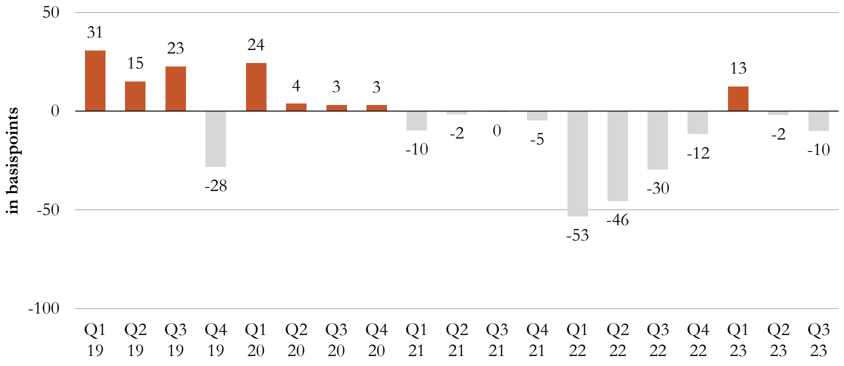
The unfavourable sector composition of the green index also had a negative impact. Overweighted real estate companies in particular recorded some of the highest spread widening as a result of the restrictive central bank policy introduced in mid-2022. The risk premiums of real estate companies remain at historically high levels, even if strong differences between issuers and, in some cases, countries of domicile (the real estate sector in Scandinavia is the most affected) are recognisable.

The overweighting in the real estate sector also offers the green index opportunities in the medium term

Due to the high overweighting in the real estate sector, the green index has the opportunity to benefit disproportionately from a relief of this sector compared to the overall market in the medium term. On the other hand, the credit component could potentially underperform if a real estate company defaults for the first time, which could affect the entire sector.

Fig. 4: The green index has benefited since the beginning of 2023 from declining risk premiums

Difference in the performance of the credit component of EUR IG Corporate Green Bonds compared to EUR IG Corporates as a whole



Source: ICE, Berenberg, As of: 30/09/2023

Outlook

In recent months, the changed interest rate and yield environment has significantly increased the attractiveness of bonds as an asset class: high, attractive, decent interest income underpins the importance of corporate bonds with strong credit ratings in the investment portfolio of every investor.

New yield environment leads to a resurgence of bonds in the portfolio context

Utilities are likely to remain the largest non-financial sector within the green index for the next few years. Due to its business models and the transformation of the energy industry, this sector benefits from an intuitive use of green funds, meaning that green bonds should continue to be the dominant refinancing instrument for these companies in the future.

Utilities and banks are likely to remain the largest issuers of green bonds in the future

The same applies to banks: this is also understandable in the refinancing of the lending business for energy-efficient renovations and sustainable public transport, for example.

The new interest rate environment remains challenging for real estate companies. They are currently increasingly seeking access to the traditional credit market again. The share of real estate companies in the green index has therefore already fallen and is likely to fall even further.

Berenberg not only offers the opportunity to participate in the positive aspects of green bonds via a dedicated mutual fund. In addition to achieving an attractive return, the aim is also to promote ecological and/or social added value for society. With our experience and knowledge of fundamental issuer analysis, we select exciting and sustainable impact-orientated investment opportunities from the green bond universe. In addition, we actively utilise the knowledge gained from this article (including sector weights and sensitivities to market parameters) with the aim of generating an excess return compared to a benchmark index.

Using findings from the performance comparison profitably for bond investors

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