Index Insights | Sustainable Investment

Bridging the sustainability gap in fixed income

Introducing the FTSE Blossom Fixed Income Series

May 2025

AUTHORS

Julien Moussavi, Ph.D.
Head of Sustainable Fixed Income Product
Julien.Moussavi@lseg.com

Claire Hugo
Senior Product Specialist, Sustainable Fixed Income Product
Claire.Hugo@lseg.com

Lee Clements
Director, Applied SI Research
Lee.Clements@lseg.com

FTSE RUSSELL
An LSEG Business

Introduction

The global investment landscape is undergoing a structural shift as sustainability becomes the focus of more and more investment strategies. Initially applied primarily within the equity asset class, **sustainable investment approaches are now gaining strong traction within fixed income** as well. This trend is driven by growing regulatory pressure, evolving investor preferences and an acute awareness of the climate transition's funding needs, much of which will be met by bond issuance. With an estimated $9.2 trillion per year required to finance the development of a low-carbon economy over the next two and a half decades, fixed income is emerging as a critical channel for mobilising capital toward sustainable outcomes.

While sustainable investing in fixed income was once seen as a niche approach, in recent years we have seen an acceleration in the uptake of this type of strategy. From 2023 to 2024, sustainability-focused bond funds outpaced their equity counterparts in cumulative flows, and over $800 billion in sustainable bonds were issued in 2024 alone. Investors are increasingly applying Environmental, Social, and Governance (ESG) considerations to fixed income strategies to better manage long-term risks, enhance portfolio resilience and contribute to climate and social goals.

In response to the growing demand for sustainable bond investment strategies, FTSE Russell has expanded its successful **FTSE Blossom equity index approach** into fixed income by means of the launch of the **FTSE Blossom Fixed Income Index Series**. This new suite of indices aims to deliver ESG-aligned exposure in corporate bond markets, starting with Japan and expanding globally.

In this paper we address a key question: does the incorporation of sustainability considerations into fixed income benchmarks—particularly through the Blossom methodology—effectively align portfolios with ESG goals without compromising performance or risk-adjusted returns? In other words, **can sustainable corporate bond indices offer meaningful differentiation and risk mitigation in an asset class historically driven by credit fundamentals?**

Our analysis of the FTSE Blossom Fixed Income indices—both in Japan and globally—demonstrates promising outcomes. **These indices maintain a high correlation with and comparable yield characteristics to their parent benchmarks**, while achieving marginally lower volatility and low tracking error. Sectoral, quality and maturity shifts illustrate a meaningful tilt toward issuers with better ESG credentials. Importantly, ESG-integrated bond portfolios showed resilience during market stress and signs of reduced credit risk, supporting the thesis that **ESG factors enhance long-term bond performance through improved issuer quality and risk management**.

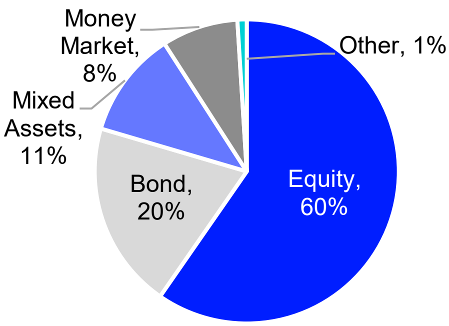
As sustainable finance continues to evolve, fixed income is not just catching up—it is taking a lead role in financing the transition to a sustainable economy. **The FTSE Blossom Fixed Income Index Series is designed to equip investors with tools to pursue ESG goals within their bond allocations**, offering a transparent, rules-based approach grounded in FTSE Russell's well-established equity methodologies. This paper explores the rationale, construction, and performance of these indices, and reflects on what they signal for the future of sustainable fixed income investing.

Contents

Growing demand and penetration of sustainability in fixed income

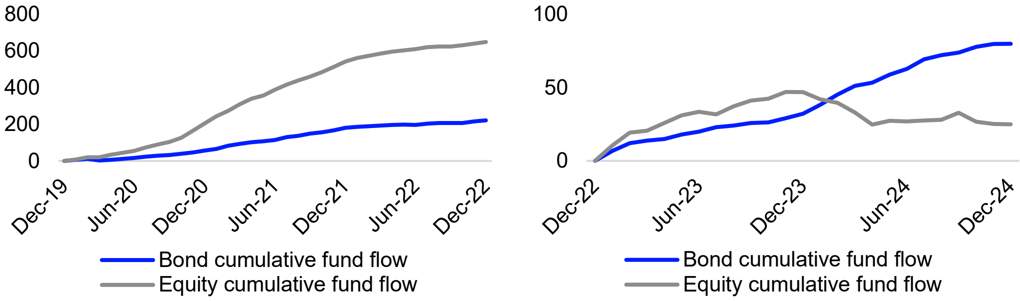
Sustainable investment approaches have seen growing penetration around the world, reflecting pressure both from asset owners/stakeholders and policymakers. Increasingly, investors have incorporated sustainability into their investment processes, both in terms of seeking investment opportunities and managing overall portfolio risk. Whilst up to now sustainable investment (SI) has predominantly been focused on equities, it applies across asset classes and has been growing in fixed income. Asset owners have increasingly been applying their SI philosophy across multi-asset portfolios and investment managers have been developing different types of SI fixed income products, understanding that SI can apply to bonds in a different way to equities. As at end-2024, 60% of SI-focused assets under management (AuM) were in equity funds;[1] however, 20% of the total was in bond funds (representing $541bn). In the 3 years from 2020 to 2022, SI equity fund assets grew much faster than SI bond fund assets. However, market conditions have changed in the last two years: SI bond funds attracted greater flows than SI equity funds from 2023 to 2024.

Exhibit 1: SI-focused fund AUM by asset class



Source: Lipper SI focused ETF and Mutual Fund AuM, December 2024

Exhibit 2: Cumulative fund flows in SI bond and equity funds 2020-22 vs 2023-24 ($bn)



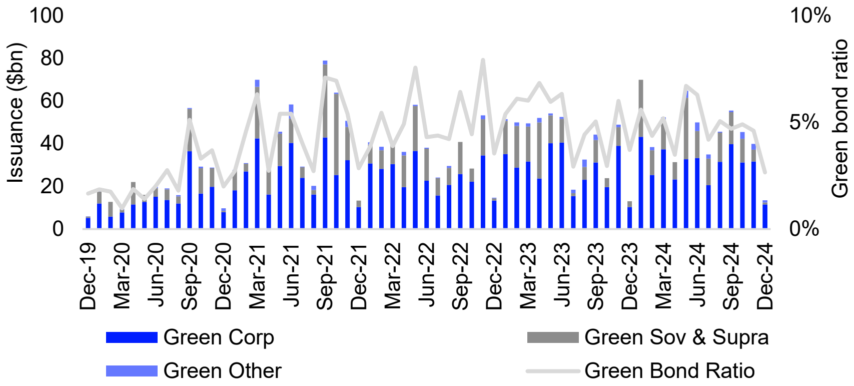
Source: Lipper SI focused ETF and Mutual Fund AuM, December 2024.

Hand in hand with growing investor interest in sustainability in fixed income, there is an increasing interest from issuers in sustainability-linked bonds.[2] In 2024, $800bn of sustainable bonds were issued

[1] Lipper SI Focused ETFs and Mutual Funds
[2] Financing the green transition: sustainable bond issuance remains robust | LSEG

and $765bn of sustainable loans.[3] More specifically, green bonds[4] see ongoing issuance on a regular basis, particularly from corporates but also from certain governments and quasi-governmental organisations. Green bonds represented around 5% of global bond issuance for the four years ending December 2024.

Exhibit 3: Growth of Green and Sustainable Bond Issuance



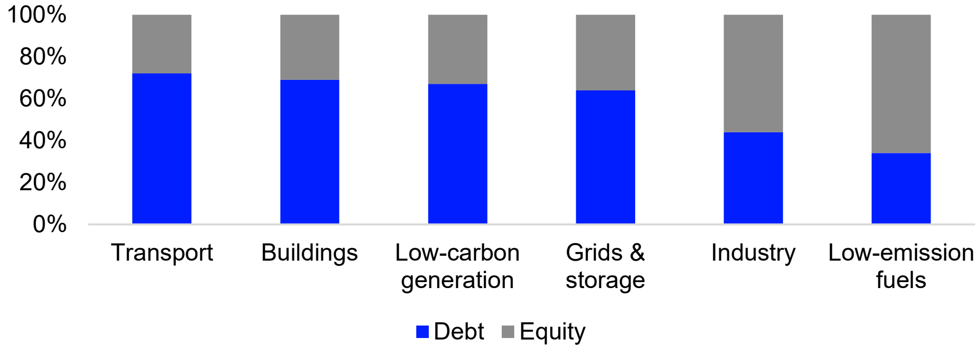
Source: LSEG, data to December 31, 2024.

[3] Sustainable Finance Review Full Year 2024, LSEG Deals Intelligence
[4] Green bonds refer to bonds whose proceeds will be used to finance general climate or environmental projects such as renewable energy, low carbon transport and water management.

Sustainable fixed income and the energy transition

The fixed income market will play a vital role in sustainability. Whilst the institutional owners of equities may influence corporate behaviour through voting and stewardship programmes, it's important to remember that most of the energy transition will be paid for through debt issuance. The estimated cost of the transition to less carbon-intensive energy production and towards a more sustainable economy has been estimated at $9.2 trillion per year over the period to 2050.[5] Meanwhile, debt forms the major part of the capital structure of most clean energy investment projects, particularly in areas such as transport, buildings and low-carbon energy generation. All this creates a large demand for sustainable debt and for sustainability-focused debt investment.

Exhibit 4: Typical capital structure of clean energy investments in advanced economies in IEA climate-driven scenarios (% of funding by asset class)



Source: The Cost of Capital in Clean Energy Transitions – Analysis | IEA, December 2021.

The sustainable bond and loan market, which is already more than $1trn in size, is one example of the debt market already moving to support the energy transition and to address the risks associated with climate change. In addition, research into the cost of capital for energy investment projects shows that solar and wind power projects have seen consistently lower project finance spreads since 2015[6]. Moreover, whilst the rising global interest rates seen since 2022 have been a headwind for the renewable energy sector, they have not slowed the rate of deployment and 2024 was a record year for clean energy installations.[6] The same is true in the financing of corporate transitions, with research into corporate loans to the Energy and Utilities sectors showing that firms with higher net zero transition scores have lower loan spreads.[7]

[5] The net-zero transition: Its cost and benefits | Sustainability | McKinsey & Company
[6] Energy transition well underway despite interest rate setbacks | Smith School of Enterprise and the Environment
[7] Corporate Net Zero Transition and Financing Cost: Evidence of Impact from Global Energy and Utilities Sectors | Oxford Law Blogs

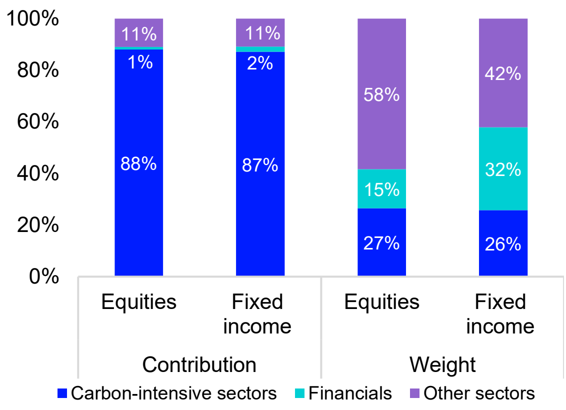
Innovation in sustainable fixed income – understanding climate and sustainability risk

It is important to understand that a sustainable investment approach within the fixed income asset class is likely to have different goals than a sustainable investment approach in equities. In equities, investors are often looking for the potential of sustainable investing methodologies to enhance returns. However, the sustainable investment factors which drive performance in equities are unlikely to have a significant impact in bonds. In fixed income, the benefits of a sustainable approach are likely to come more in terms of risk reduction, the identification of areas of potential long-term risk for a company, the reduced impact of potential regulatory issues and a reduction in overall portfolio volatility. In addition to risk mitigation, the integration of sustainability into fixed income can have a positive impact on stewardship/engagement activities, particularly when bonds are being refinanced.

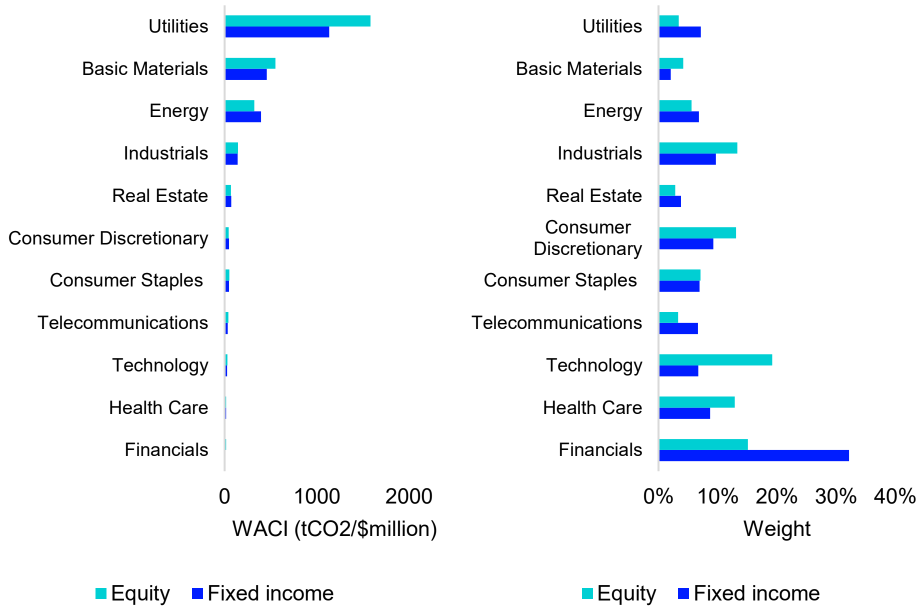
Carbon risk

Despite the sectoral differences between the corporate bond and equity markets—such as the much higher exposure to financials in the former and much higher exposure to technology in the latter—they have similar exposure to carbon-intensive sectors, which account for most scope 1 & 2 carbon emissions. They also have similar carbon intensities, whether calculated on revenues (2022 FTSE All World 137 tonnes per US$ million versus FTSE WBIG Corporate Bond 149 tonnes per US$ million) or enterprise value including cash (2022 FTSE All World 57 tonnes per US$ million versus FTSE WBIG Corporate Bond 60 tonnes per US$ million).[8] Bonds issued by companies in carbon-intensive industries would be the second largest segment of the corporate debt market, after financials.

Exhibit 5: Carbon exposure across corporate debt vs equities



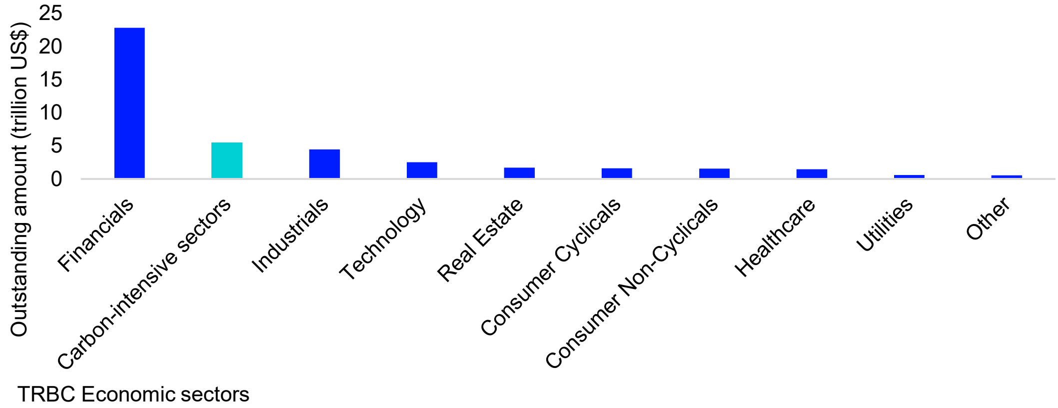
[8] Decarbonisation in portfolio benchmarks 2024 | LSEG



Source: [Decarbonisation in portfolio benchmarks](), LSEG, September 2024.

As such, corporate bond investors face a similar exposure as equity investors to the potential downside risks from these sectors in the event of regulatory actions, energy price or demand shocks (in addition to the rolling impact of the energy transition).

Exhibit 6: Carbon-intensive corporate debt outstanding compared to other sectors

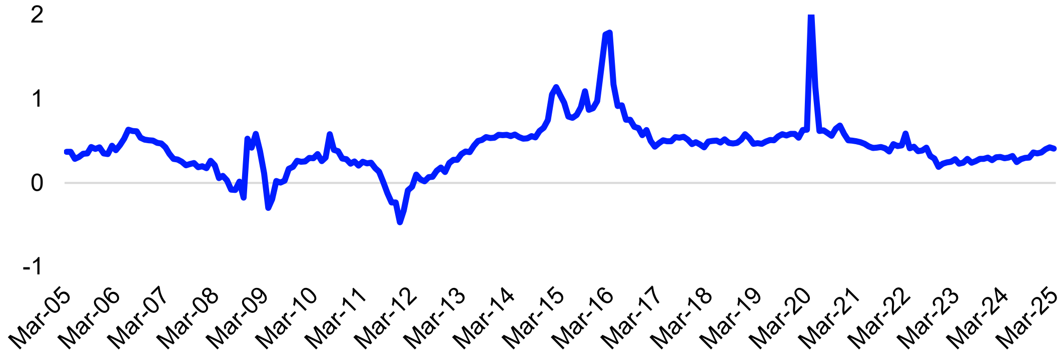


Source: [Tracing carbon-intensive debt in corporate fixed income](), LSEG, March 2024.

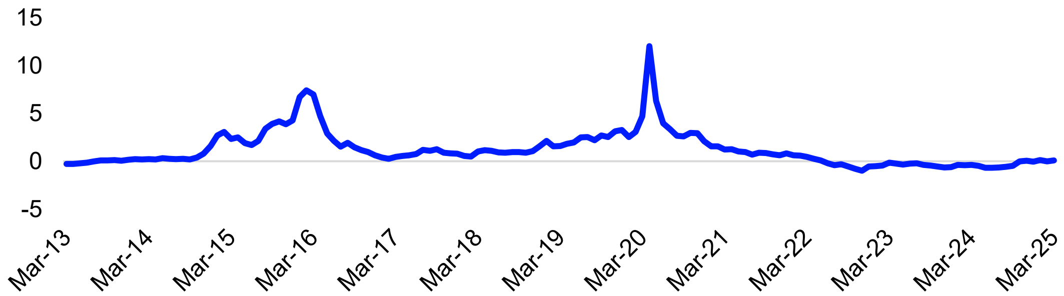
Historically, the spreads of both investment-grade and high-yield corporate bonds from the Energy sector have shown a significant widening in times of falling oil prices (e.g., in 2014) and to macro-economic uncertainty (e.g., in 2020) without showing a significant tightening in periods of rising oil prices to compensate for the risk.

Exhibit 7: Yield spread of Energy sector corporate debt over the broader corporate bond market

Investment grade



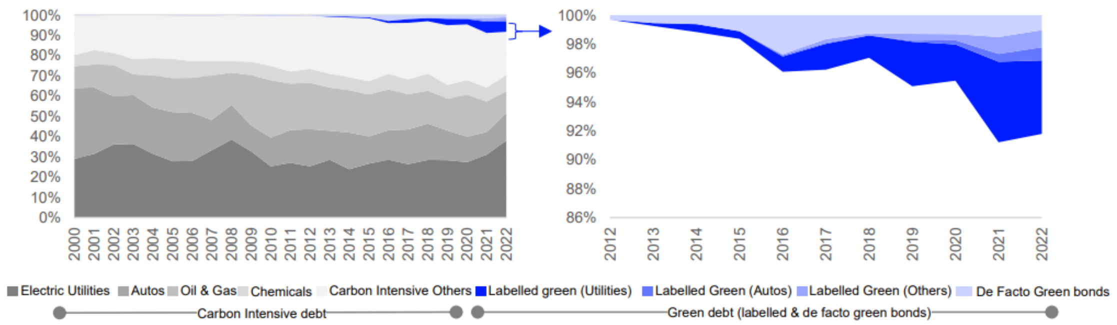
High Yield



Source: LSEG YieldBook Index Module, data as at March 4, 2025.
FTSE WorldBIG Corporate Index and FTSE World High Yield Index, Energy sector = GLIC Industrial - Energy

Only a small proportion of the debt issued by companies in carbon-intensive industries has been replaced by sustainability-focused debt (such as green bonds). An increasingly large reckoning for bond investors is upcoming as $3.2trn of carbon intensive debt is set to mature before the end of the current decade. Investors will face the choice of refinancing this debt or pushing for greater engagement with the energy transition, potentially through the issuance of green bonds. This period gives investors the greatest potential for leverage in engagement,[9] but it also implies higher potential risk on their energy-intensive bond holdings.

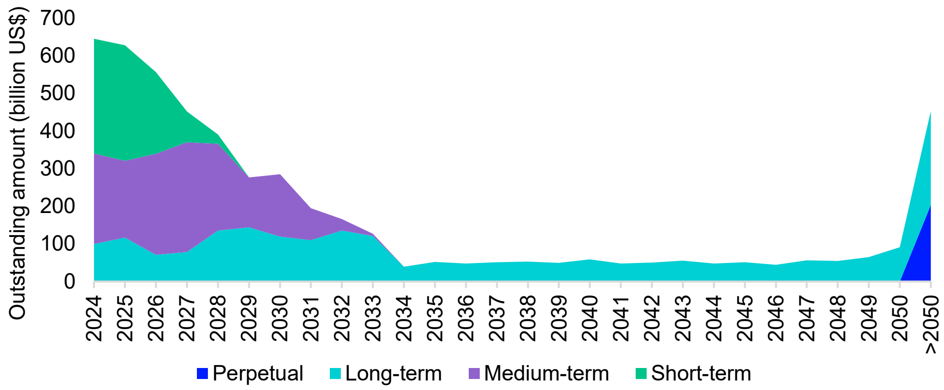
Exhibit 8: Carbon intensive debt vs green debt



Source: Tracing carbon-intensive debt in corporate fixed income, LSEG, March 2024.

[9] It's time for bondholders to take their seat at the stewardship table | Smith School of Enterprise and the Environment

Exhibit 9: Carbon-intensive debt maturity profile



Source: Tracing carbon-intensive debt in corporate fixed income, LSEG, March 2024.

How sustainability factors influence corporate bond performance and risk

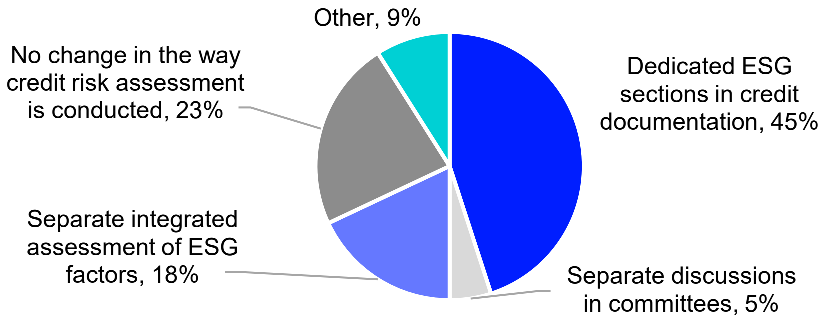
A key question for fixed income investors is how sustainability factors could impact the performance and risk characteristics of bond portfolios. In the past, a lot of attention has been focused on how sustainability affects the performance of companies and specifically their growth, profitability and stock price performance. However, these questions are arguably less relevant for bond holders. Less attention has been devoted to the impact of sustainability on the risk of companies, in particular on credit ratings, yield spreads and the overall volatility of bond portfolios.

Sustainability factors influencing credit risk assessment

An important element for bond investors to consider is the growing impact of ESG and sustainability on credit risk assessments and the credit rating process. There is a potential avenue by which sustainability factors, including extra-financial elements that are often overlooked in traditional credit assessment processes or which fall beyond normal time horizons, can have an impact on bond yields/spreads and hence the performance and volatility of corporate bond portfolios. In a survey, the United Nations PRI found that 68% of investors used ESG in some fashion within their credit risk assessment process.[10,11] S&P Global Ratings found that between April 2020 and December 2023 13% of credit rating actions were driven by ESG factors, more than three quarters of which were negative.[12]

[10] ESG, credit risk and ratings: part 4 - deepening the dialogue between investors, issuers, and CRAs | Discussion paper | PRI
[11] Determinants of corporate credit ratings: Does ESG matter? | International Review of Financial Analysis
[12] ESG in Credit Ratings Deep Dive | S&P Global Ratings | March 13, 2024

Exhibit 10: ESG in credit risk assessment



Source: ESG, credit risk and ratings: part 4 - deepening the dialogue between investors, issuers, and CRAs | Discussion paper | PRI, April 2023

Sustainability factors influencing corporate bond performance and risk

Several studies have looked at the impact of sustainability factors (typically ESG scores) on the performance and risk of portfolios of corporate bonds. These find that the yield of a portfolio of corporate bonds is typically inversely correlated with sustainability performance.[13] However, this lower yield is associated with lower-risk companies and, when combined with a positive impact on the evolution of credit spreads, improved sustainability leads to performance which is in line or slightly ahead of the market.[14] More importantly, the use of sustainability factors reduces the volatility and credit risk of a bond portfolio.[15] These studies also find that, similar to the spread widening impact observed in Energy corporate bonds in periods of weak oil prices and/or macro-economic uncertainty, there was a negative impact of the credit rating and yield spreads of weak sustainability companies versus strong sustainability companies during periods of government action on sustainability (such as the Paris climate change conference).[16]

Diversification Benefits

Investing in sustainable corporate fixed income offers several benefits, such as risk mitigation or improved returns.

Integrating ESG factors into fixed income investing can help reduce the overall risk of the portfolio. By prioritising long-term sustainability, investors are better protected against regulatory changes, environmental disasters and social unrest.[17] For instance, companies that adhere to robust ESG practices are more likely to implement better risk management strategies, leading to lower default rates and more stable returns.[18]

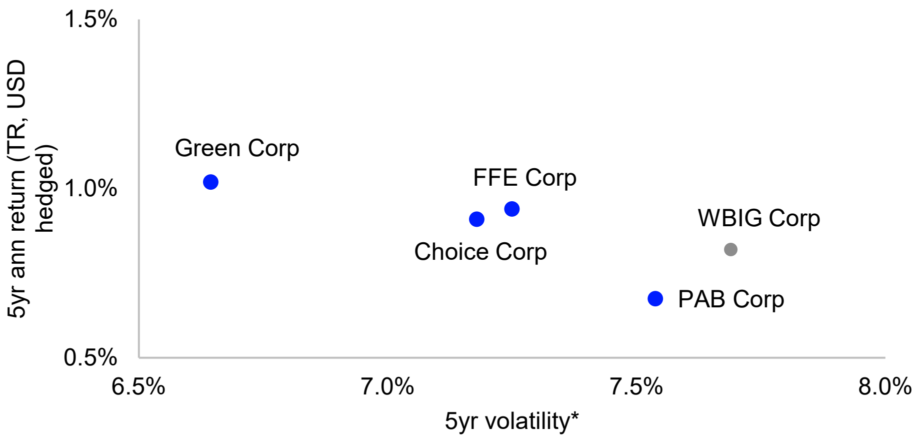
ESG-focused fixed income investments can even lead to improved returns. The World Bank[19] highlights that incorporating ESG criteria into fixed income investment strategies can enhance risk management and potentially improve financial performance by identifying companies with sustainable practices and lower long-term risks. Companies that align their strategies with ESG principles are often better positioned for long-term success, resulting in enhanced financial performance. This trend is supported by the increased prominence of ESG considerations in investor mandates, suggesting that these investments are seen as valuable for generating sustainable returns.[20]

[13] ESG and Corporate Bond: A yield spread approach | Probability & Partners
[14] Assessing the impact of ESG in fixed income | Insight Investment
[15] ESG criteria and the credit risk of corporate bond portfolios | Journal of Asset Management
[16] Climate regulatory risks have strong impacts on corporate bond pricing and credit ratings | Blog post | PRI
[17] Global Outlook on Financing for Sustainable Development 2025 | OECD
[18] Fixed income - making ground in ESG | FTAdviser
[19] Incorporating Environmental, Social and Governance Factors into Fixed Income Investment | World Bank Group
[20] The outlook for sustainable fixed income | FTAdviser

What we observe in FTSE SI corporate bond indices

Looking at a range of global, SI corporate bond indices over the 5 years to December 2024 we find similar results, despite a range of methodologies, from a more concentrated corporate green bond index, a tilted Paris-aligned (PAB) index and simpler exclusionary indices (Ex-fossil fuel enhanced and Choice). These indices' Performance was relatively similar to the reference market index (the FTSE WorldBIG Corporate index), although 3 out of 4 SI indices slightly outperformed. However, all of the SI indices showed lower volatility than the market.

Exhibit 11: FTSE SI corporate bond indices risk/return vs market



Source: FTSE Russell, data as at December 31, 2024
*annualised volatility of monthly returns

What are investors doing?

As observed in the earlier section, SI-focused bond funds have continued to grow, with faster growth than SI equity funds over the last two years. Issuance of corporate green and sustainable bonds has also continued apace and is now an entrenched part of the debt capital markets. Investors' approaches to SI in fixed income are broad, ranging from the exclusion of certain issuers (such as carbon-intensive industries), actively tilting index weights based on issuer SI data (such as ESG scores or carbon intensity), dedicated green bond funds or actively engaging with issuers based on SI data and performance.

Some examples of investors which have applied sustainable investment principles to their bond investments include:

- A large Dutch pension fund aligned its entire multi-asset portfolio to the UN Sustainable Development Goals (SDGs). As part of this initiative, it created a global SDG-aligned credit index.[21]

  Pensioenfonds Detailhandel, Responsible Investment Policy Statement | FTSE Russell

[21] The Case for Integrating ESG into Fixed Income Portfolios | SSRN

The FTSE Blossom Index Approach

Current Trends in Japanese ESG-Related Finance

Japan has seen a significant rise in ESG (Environmental, Social, and Governance) investing, driven by regulatory changes, corporate governance reforms and increasing investor awareness of sustainability issues.[22] The Japanese government has introduced policies such as the Corporate Governance Code and the Stewardship Code, encouraging companies to disclose ESG-related information and adopt sustainable practices.

This has led to a surge in ESG-linked financial products, including green bonds and sustainability-linked bonds, that align with Japan's long-term green finance strategy. Japan's sustainability bond market doubled to ¥6.7 trillion in 2023, driven by the country's pledge to achieve net zero greenhouse gas emissions by 2050. The introduction of sovereign transition bonds in 2024 further supports Japan's net-zero shift. [23]

Key institutional investors have also played a pivotal role in advancing ESG investment by integrating ESG factors into their investment processes, influencing other financial institutions to prioritise ESG considerations. For instance, Japan's Government Pension Investment Fund (GPIF), the world's largest public pension fund, has been one of the early adopters of the integration of ESG into passive mandates.[24]

In contrast with global trends, Japan's commitment to ESG principles remains steadfast, positioning it as a leading market for transition finance in Asia. The Japanese approach focuses on science-based targets and transparency, aligning with the Paris Agreement's goals.[25]

Success of the FTSE Blossom Equity Franchise

Recognising this trend, in 2017 FTSE Russell designed the **FTSE JPX Blossom Japan Index** to help investors and other market participants integrate and promote ESG considerations.[26] This equity index enhances ESG exposure based on FTSE Russell ESG Scores, while maintaining the index characteristics of a broad market benchmark. Since its launch in 2017, the index has shown significant improvements in ESG metrics while maintaining minimal tracking error.[27]

In addition, in 2022, FTSE Russell developed a sector-relative version of the FTSE JPX Blossom Japan Index . The **FTSE JPX Blossom Japan Sector Relative Index** uses a sector-relative approach to reduce the deviation from the base index and identify a company's relative ESG scores in the business sector. The index also aims to address the climate transition by incorporating climate risk management criteria from the perspective of management quality.

The FTSE Blossom Japan Index Series has been a remarkable success, reflecting the performance of companies demonstrating specific ESG practices in Japan. Since 2017, the index series has been adopted by GPIF in Japan as a benchmark for their domestic passive investment portfolio. It has been the top performer, achieving the highest returns among all their mandated Japanese Sustainable equity indices.[28]

[22] Powerful Trends Driving ESG Bonds in Japan's Financial Market 2025 | HayInsights
[23] Japan's Steady Approach to ESG Investing Gains Momentum Amid Global Uncertainty | ESG News
[24] GPIF's ESG strategy: does it work? | PRI
[25] Diverging Paths: Japan Embraces ESG As US Retreats | Global Finance
[26] FTSE Blossom Japan | Integrating ESG Into Core Japanese Benchmarks | FTSE Russell
[27] FTSE Blossom spurs new Japanese sustainable investment fixed income indices | LSEG
[28] 2023 ESG Report | GPIF | Page 42

FTSE Blossom goes global

Building on the success of the FTSE Blossom Japan Indexes, FTSE Russell launched the **FTSE Blossom World Index Series** in 2025. This new series includes global companies that demonstrate specific ESG practices, expanding the Blossom methodology to the US, Europe, and APAC (ex-Japan).[29] The indices are designed to allow investors to evaluate ESG considerations in their investment strategies globally, using a transparent methodology to assess a company's ESG exposure and performance.

FTSE Blossom Fixed Income Index Series

Sustainable fixed income investment in Japan has gained momentum and the increasing issuance of green bonds is expected to generate a steady stream of income with lower risk when compared to equities.[30] This trend is supported by innovations in fintech and sustainable finance, which are shaping the future of fixed income investment in Japan.[31]

The expansion of the FTSE Blossom range to incorporate new Japanese sustainable investment fixed income indices is a significant development. This expansion aims to provide investors with comprehensive tools to incorporate ESG factors into their fixed income portfolios.[32]

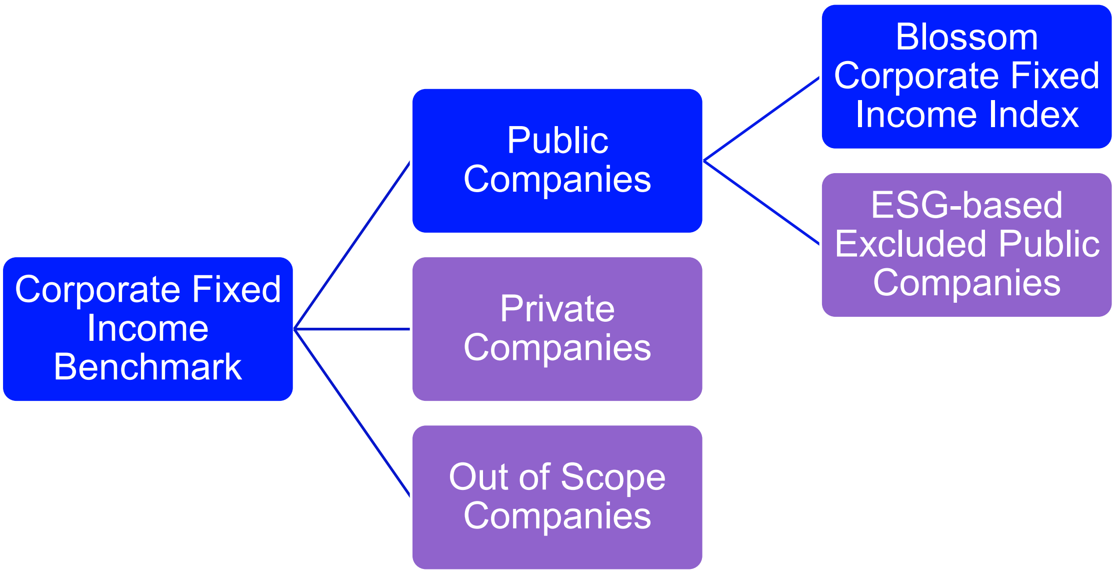
- The **FTSE JPX Blossom Japan Fixed Income Index**, launched in 2024, focuses on Japanese yen-denominated corporate bonds issued by public traded companies in Japan with strong ESG practices. Based on the underlying FTSE Japanese Broad Bond Index (JPBBI), the FTSE JPX Blossom Japan Fixed Income Index selects issuers from the members of the FTSE JPX Blossom Japan Sector Relative Index and their subsidiaries.
- The **FTSE Blossom World Fixed Income Index** is designed to measure the performance of global investment grade corporate bonds issued by public traded companies. Based on the underlying FTSE World Broad Investment-Grade Bond Index (WorldBIG), the FTSE Blossom World Fixed Income Index derives its issuers from the members of the FTSE Blossom World Sector Relative Index.

FTSE JPX Blossom Japan Fixed Income Index construction

Index constituents are defined through a mapping between the stocks of corporate entities tracked by the FTSE Blossom equity indices and the debt of the corporate entities and their subsidiaries, tracked by the FTSE Blossom fixed income indices. Debt that is included in the FTSE JPBBI and issued by corporate entities with stocks eligible for the FTSE JPX Blossom Japan Sector Relative Index and their subsidiaries are included in the FTSE JPX Blossom Japan Fixed Income Index and its corresponding sub-indices. Debt that is included in the FTSE WorldBIG and issued by corporate entities with stocks eligible for the FTSE Blossom World Sector Relative Index and their subsidiaries is included in the FTSE Blossom World Sector Relative Index and its corresponding sub-indices.

[29] FTSE Blossom goes global | LSEG
[30] Sustaining the future: the ongoing case for sustainable bonds | Nikko Asset Management
[31] Fixed Income Investment Landscape in Japan | HayInsights
[32] How innovation and demand are driving sustainable fixed income | LSEG

Exhibit 12: FTSE Blossom Fixed Income indices' construction process



Source: FTSE Russell

The construction process of the FTSE Blossom Fixed Income indices involves three steps. We start from an existing FTSE Fixed Income benchmark, such as the FTSE Japanese Broad Bond Index or the FTSE World Broad Investment-Grade Bond Index:

i. First, we remove private companies;
ii. Second, we remove public out-of-scope companies, mainly for geographical and/or currency reasons;
iii. Finally, we remove public companies with a low ESG score or those involved in controversies, (i.e., those excluded from the FTSE Blossom Japan or World (Equity) Sector Relative indices).

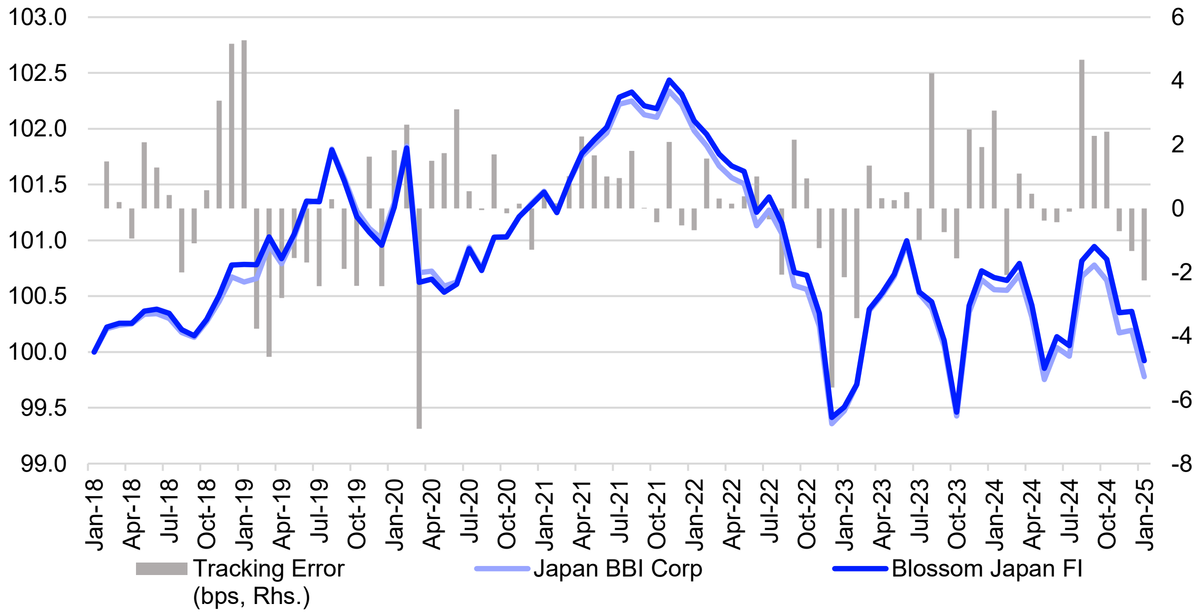
In terms of market value weights and as of early 2025, for the FTSE Japanese Broad Bond Index, this three-step process leads us to remove (i) *c.* 13.7% of private companies (ii) *c.* 7.5% of out-of-scope companies and (iii) *c.* 6.6% of public companies with low ESG scores or controversies.

For the FTSE World Broad Investment-Grade Bond Index, the three-step process leads us to remove (i) *c.* 12.1% of private companies, (ii) *c.* 4.1% of out-of-scope companies, and (iii) *c.* 19.8% of public companies with low ESG scores or controversies.

All in all, the FTSE JPX Blossom Japan Fixed Income Index retains *c.* 72.2% of the market value weight of its parent index while the FTSE Blossom World Fixed Income Index retains *c.* 64.0% of the market value weight of its parent index.

FTSE JPX Blossom Japan Fixed Income Index

Exhibit 13: FTSE JPX Blossom Japan Fixed Income Index vs parent index – Performance



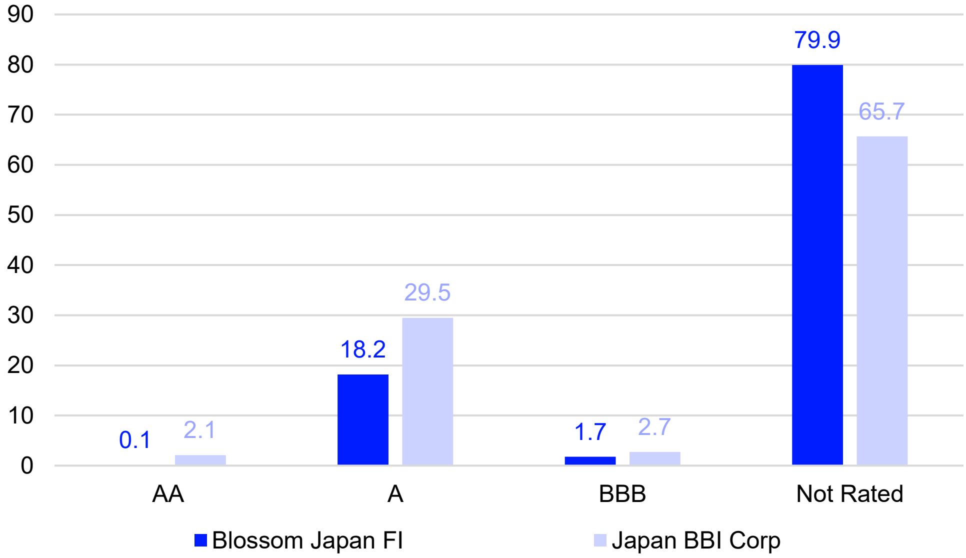
Source: FTSE Russell, data as at January 31, 2025.
The results shown reflect back-tested performance. Please see page 23 for further information.

Metric	Japan BBI Corp	Blossom Japan FI
Annualised Return	-0.03%	-0.01%
Annualised Volatility	1.09%	1.13%
Risk-Adjusted Return	-0.03	-0.01
Annualised Tracking Error		0.08%
Return Correlation		99.82%
Current Yield*	0.83%	0.84%
Yield to Maturity*	1.28%	1.32%
Effective Duration*	4.60	4.70
OAS*	54.96	57.93
Number of Bonds*	1,268	934

Source: FTSE Russell, data from January 2018 to January 2025
The results shown reflect back-tested performance. Please see page 23 for further information.
* January 31, 2025 data.

From a performance perspective, the FTSE JPX Blossom Japan Fixed Income Index has demonstrated returns in line with its parent index for comparable levels of volatility. The very low tracking error, which reflects the index construction process and its affiliation with the FTSE Blossom equity counterpart, as well as the reduction of more than 25% in the number of bonds, make this index suitable for investors wishing to take into account ESG factors in their Japanese fixed income investments.

Exhibit 14: FTSE JPX Blossom Japan Fixed Income Index vs parent index – Quality breakdown

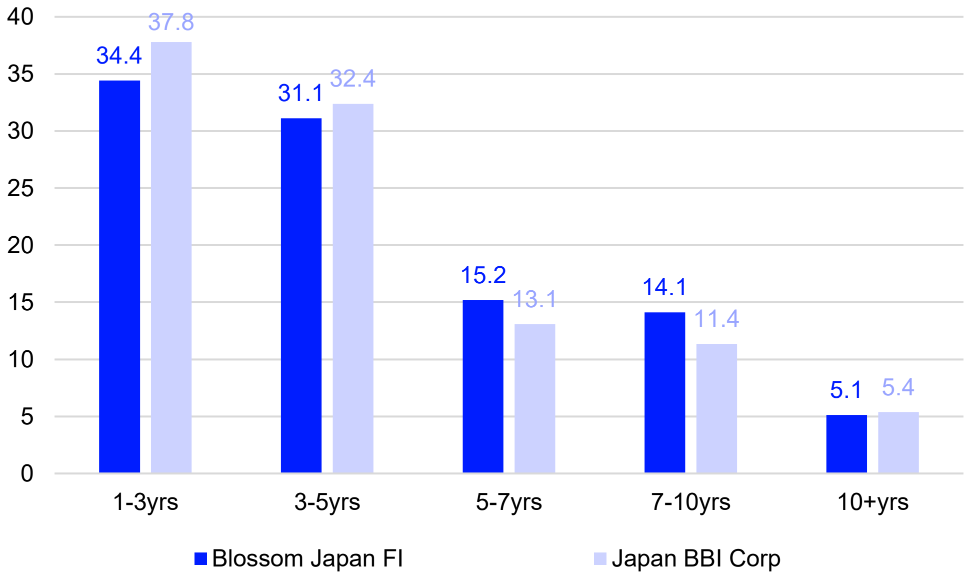


Source: FTSE Russell, data as at January 31, 2025.
The results shown reflect back-tested performance. Please see page 23 for further information.
Notes: The quality buckets reflect ranges of ratings, e.g., bonds rated from AA+ to AA- are in the AA quality bucket.

A quality breakdown comparison between the FTSE JPX Blossom Japan Fixed Income Index and its parent index shows that that the proportion of unrated bonds increases by 14.2 percentage points, mostly at the expense of A rated bonds (-11.3 pp).

The significant share of unrated bonds within the two indices is notably due to the existence of a Japanese credit rating agency, Rating Investment and Information, Inc (R&I), on which the domestic bond market is more dependent in comparison to the main American credit rating agencies. The higher share of unrated bonds in the FTSE JPX Blossom Japan Fixed Income Index is a result of the selection of listed companies that issue bonds with higher ESG scores.

Exhibit 15: FTSE JPX Blossom Japan Fixed Income Index vs parent index – Maturity breakdown

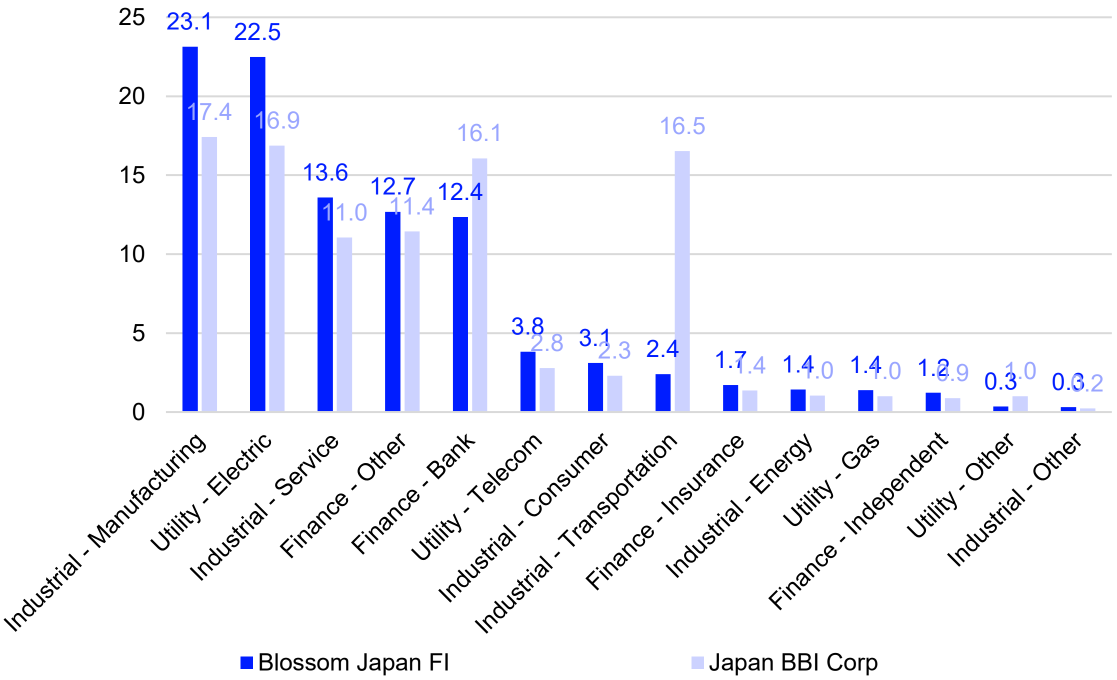


Source: FTSE Russell, data as at January 31, 2025.
The results shown reflect back-tested performance. Please see page 23 for further information.
Notes: The maturity buckets reflect the residual maturity of bonds.

A maturity breakdown comparison between the FTSE JPX Blossom Japan Fixed Income Index and its parent index shows that the share of medium-term (5-10 year) bonds increases by 4.8 percentage points, almost completely at the expense of short-term (1-5 year) bonds.

This maturity drift is quite common in bond indices that take into account sustainable elements. Bonds that meet specific ESG criteria might have longer maturities because they are often issued to fund long-term projects, such as the development of renewable energy infrastructure or social impact initiatives.

Exhibit 16: FTSE JPX Blossom Japan Fixed Income Index vs parent index – Sectoral breakdown



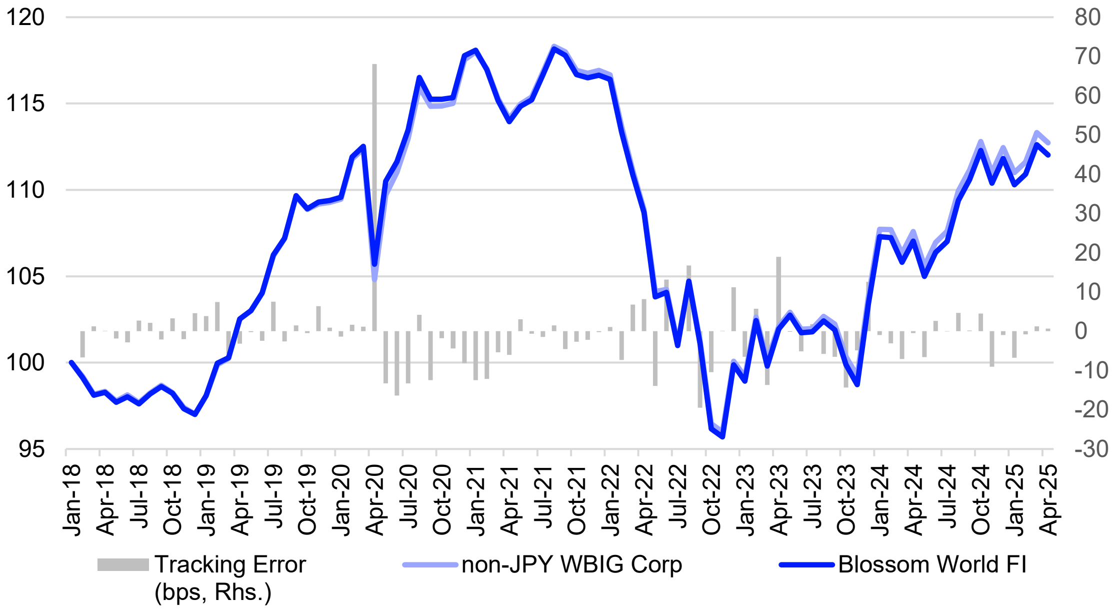
Source: FTSE Russell, data as at January 31, 2025.
The results shown reflect back-tested performance. Please see page 23 for further information.
Notes: To perform this sectoral comparison, the FTSE proprietary Global Industry Code (GLIC) are used. Please see FTSE Fixed Income Guide, Section 4, for further details.

A sectoral breakdown comparison between the FTSE JPX Blossom Japan Fixed Income Index and its parent index shows that certain sectors are overweighted: for example, Industrial – Manufacturing (+5.7 percentage points), Utility – Electric (+5.6 pp), and to a lesser extent Industrial – Service (+2.6 pp) gain increased weights at the expense of the Finance – Banking (-3.7 pp) and especially the Industrial – Transportation (-14.1 pp) sectors.

The Industrial - Transportation sector is an important corporate bond sector in Japan, with a significant number of railway companies. Given the construction of the FTSE JPX Blossom Japan Sector Relative Index, which excludes 50% of each sector based on the companies' ESG scores, it appears that the largest bond issuers have been excluded.

FTSE Blossom World Fixed Income Index

Exhibit 17: FTSE Blossom World Fixed Income Index vs parent index – Performance



Source: FTSE Russell, data as at April 30, 2025.
The results shown reflect back-tested performance. Please see page 23 for further information.

Metric	non-JPY WBIG Corp	Blossom World FI
Annualised Return	1.67%	1.58%
Annualised Volatility	6.68%	6.70%
Risk-Adjusted Return	0.25	0.24
Annualised Tracking Error		0.36%
Return Correlation		99.86%
Current Yield*	3.98%	3.97%
Yield to Maturity*	4.48%	4.48%
Effective Duration*	6.02	6.15
OAS*	85.62	83.14
Number of Bonds*	11,361	6,702

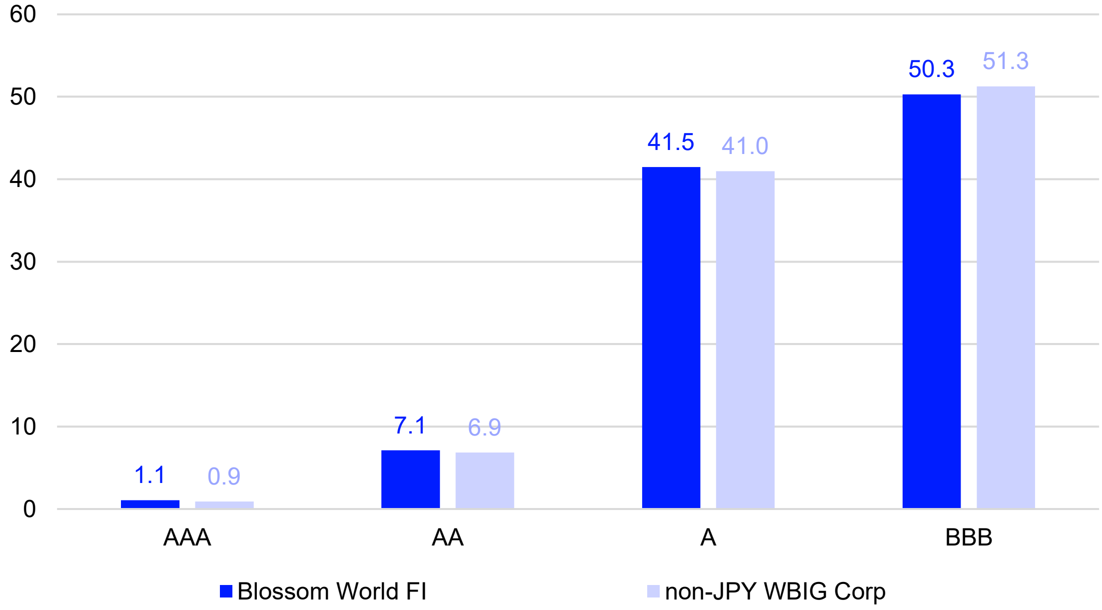
Source: FTSE Russell, data from January 2018 to April 2025.
The results shown reflect back-tested performance. Please see page 23 for further information.
* March 31 2025 data.

From a performance perspective, the FTSE Blossom World Fixed Income Index has demonstrated returns slightly below those of its parent index for comparable levels of volatility. The tracking error remained low, while the effective duration was slightly higher than that of the parent index.

The first lockdown period linked to the Covid-19 pandemic led to a bond crash of 6% in April 2020, with tracking error peaking at nearly 70 bps. If we smooth out this very singular period, annualised volatility also fell by around 70 bps and annualised tracking error fell by 7 bps.

With a reduction of more than 40% in the number of bonds, this index offers a suitable exposure to global markets for investors wishing to take into account ESG factors in their fixed income investments.

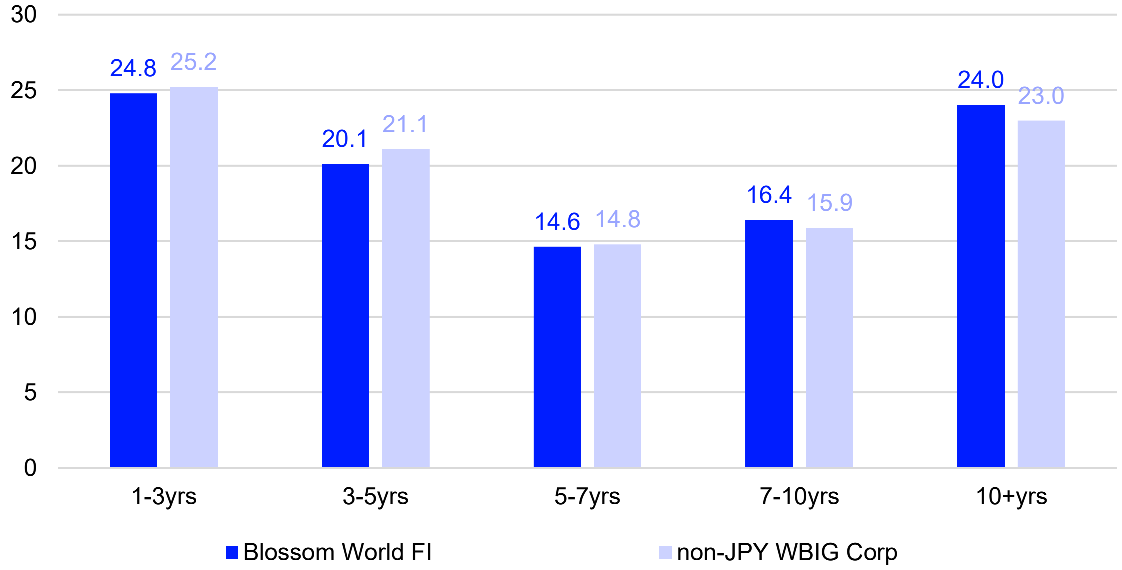
Exhibit 18: FTSE Blossom World Fixed Income Index vs parent index – Quality breakdown



Source: FTSE Russell, data as at March 31 2025.
The results shown reflect back-tested performance. Please see page 23 for further information.
Notes: The quality buckets reflect ranges of ratings, e.g., bonds rated from AA+ to AA- are in the AA quality bucket.

Given that global corporate bond universes are broader and deeper than their Japanese counterparts, the quality differences between the FTSE Blossom World Fixed Income Index and its parent index are relatively small, with the average quality of the FTSE Blossom World Fixed Income Index being slightly higher. Indeed, AAA-, AA-, and A-rated corporate bonds are more represented in the index than BBB-rated corporate bonds.

Exhibit 19: FTSE Blossom World Fixed Income Index vs parent index – Maturity breakdown

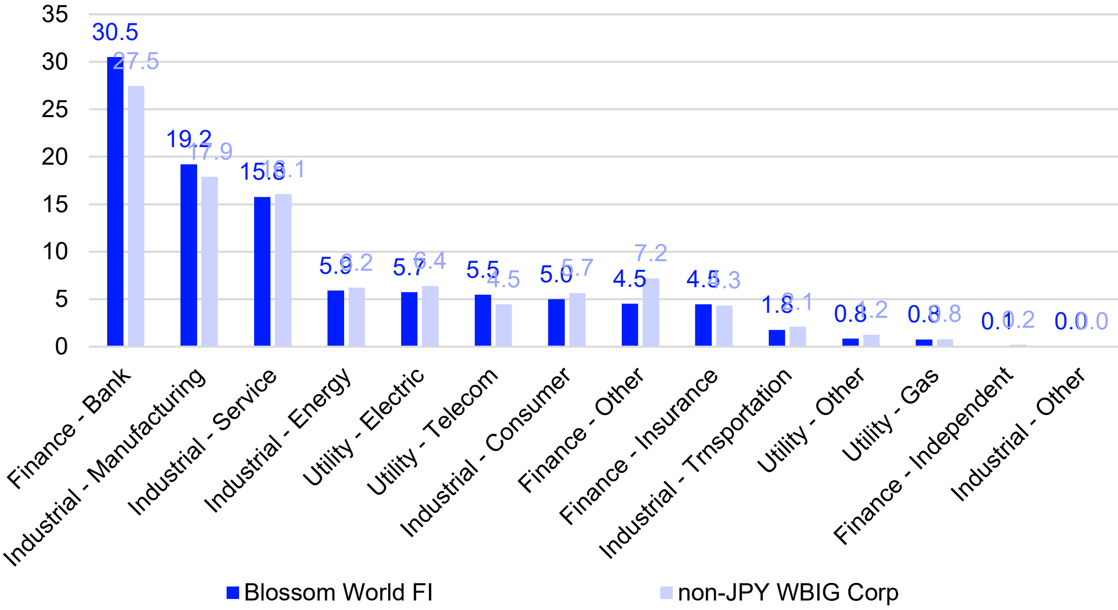


Source: FTSE Russell, data as at March 31, 2025.
The results shown reflect back-tested performance. Please see page 23 for further information.
Notes: The maturity buckets reflect the residual maturity of bonds.

A maturity breakdown comparison between the FTSE Blossom World Fixed Income index and its parent index shows that the share of medium- to long-term (7-10+ year) bonds increases by 1.5 percentage points in the FTSE Blossom World Fixed Income index, almost completely at the expense of short-term (1-5 year) bonds.

This same logic as for the FTSE JPX Blossom Japan Fixed Income Index applies in the case of the FTSE Blossom World Fixed Income Index, leading to higher index duration.

Exhibit 20: FTSE Blossom World Fixed Income Index vs parent index – Sectoral breakdown



Source: FTSE Russell, data as at March 31, 2025.
The results shown reflect back-tested performance. Please see page 23 for further information.
Notes: To perform this sectoral comparison, the FTSE proprietary Global Industry Code (GLIC) are used. Please see FTSE Fixed Income Guide, Section 4, for further details.

Lastly, a sectoral breakdown comparison between the FTSE Blossom World Fixed Income Index and its parent index shows that certain sectors--Finance – Bank (+3.0 percentage points), Industrial – Manufacturing (+1.3 percentage points), and to a lesser extent Utility – Telecom (+1.0 percentage points)—are overweighted in the FTSE Blossom World Fixed Income index, mostly at the expense of the Finance – Other (-2.7 percentage points) sector.

Conclusion

The extension of the FTSE Blossom index approach into the fixed income asset class marks a pivotal moment in the evolution of sustainable investing. As ESG considerations become embedded across asset classes, the demand for robust, transparent tools that enable investors to align their fixed income portfolios with sustainability goals has never been higher. The FTSE JPX Blossom Fixed Income Index Series addresses this demand by extending the proven Blossom equity methodology into corporate bonds—offering investors a credible, rules-based framework for integrating ESG factors without sacrificing risk-adjusted performance.

Empirical results from the Japan and World indices underscore that **sustainable bond investing can maintain competitive returns, while improving risk characteristics such as volatility and potential exposure to credit events**. The indices also reflect the broader market shift toward long-term, low-carbon and stakeholder-oriented capital allocation.

Looking ahead, fixed income is set to play a central role in financing the global energy transition and broader sustainability goals. As regulatory frameworks evolve and investor scrutiny deepens, holistic ESG index approaches like FTSE Blossom will be essential tools for managing risk and capitalising on opportunities by integrating real-world considerations into investment processes.

By integrating sustainability and fixed income with clarity and consistency, FTSE Russell's Blossom series not only responds to market demand—**it bridges the sustainability gap, helping investors to manage a sustainable cross-asset strategy**.

ABOUT FTSE RUSSELL

FTSE Russell is a leading global provider of index and benchmark solutions, spanning diverse asset classes and investment objectives. As a trusted investment partner we help investors make better-informed investment decisions, manage risk, and seize opportunities.

Market participants look to us for our expertise in developing and managing global index solutions across asset classes. Asset owners, asset managers, ETF providers and investment banks choose FTSE Russell solutions to benchmark their investment performance and create investment funds, ETFs, structured products, and index-based derivatives. Our clients use our solutions for asset allocation, investment strategy analysis and risk management, and value us for our robust governance process and operational integrity.

For over 40 years we have been at the forefront of driving change for the investor, always innovating to shape the next generation of benchmarks and investment solutions that open up new opportunities for the global investment community.

CONTACT US

To learn more, visit lseg.com/ftse-russell; email info@ftserussell.com; or call your regional Client Service team office:

EMEA +44 (0) 20 7866 1810

North America +1 877 503 6437

Asia-Pacific

Hong Kong +852 2164 3333

Tokyo +81 3 6441 1430

Sydney +61 (0) 2 7228 5659

FTSE
RUSSELL
An LSEG Business