For professional investors

ROBECO
The Investment Engineers

Robeco's Country ESG Framework

How we evaluate and integrate country ESG performance into investment portfolios

Contents

Preface 3

The Country ESG Framework – at a glance 4

Country ESG methodology – a closer look 5

Reporting the scores 9

ESG ratings – data-driven, powerfully predictive 10

Integration in investments 14

Governance – revisions and maintenance 16

Conclusion 17

Preface

Sovereign debt, issued by national governments, represents one of the largest and most significant asset classes in global financial markets. Governments raise funds through sovereign bonds to finance public expenditures, infrastructure projects, and other essential services, making these instruments a cornerstone of national and international economies.

For investors, sovereign debt offers a range of benefits, including perceived safety, liquidity, and diversification. In recent years, investors are increasingly looking beyond traditional financial metrics when evaluating sovereign debt, incorporating environmental, social, and governance (ESG) criteria into their decision-making processes to help identify investment risks and opportunities.

ESG integration in sovereign debt is particularly relevant in today's context of heightened awareness around climate change, social inequality, and governance standards. The majority of the top 10 global risks cited in the World Economic Forum Global Risk Report 2024[1] can be classified as ESG-related risks. These non-financial factors can significantly influence the long-term sustainability and risk profile of a country, affecting its ability to repay debt. As a result, ESG integration offers investors a more holistic view of sovereign creditworthiness.

"The Robeco Country ESG Framework is designed to complement traditional sovereign risk assessments carried out by rating agencies

In an effort to continuously integrate these considerations into our sovereign debt strategies, Robeco has developed a comprehensive and systematic framework comprising more than 50 indicators for determining country ESG performance. Countries' performance on individual indicators is consolidated into an overall country ESG score but can also be analyzed on a more granular level and in terms of development over time.

This framework offers an alternative and complementary view into an economy's underlying change drivers and provides us with insights into a country's strengths and weaknesses on a broad selection of ESG indicators. It primarily focuses on mid- to long-term factors which are oftentimes insufficiently considered in traditional sovereign credit ratings. These factors have an indirect (and sometimes even direct) impact on a government's ability to implement reasonable economic policies and generate sufficient revenues ensuring its ability to service its debt.

These insights also serve as input for sovereign engagement. It helps us identify opportunities where engagement on ESG topics can help mitigate risk, strengthen competitiveness, and contribute to societal outcomes.

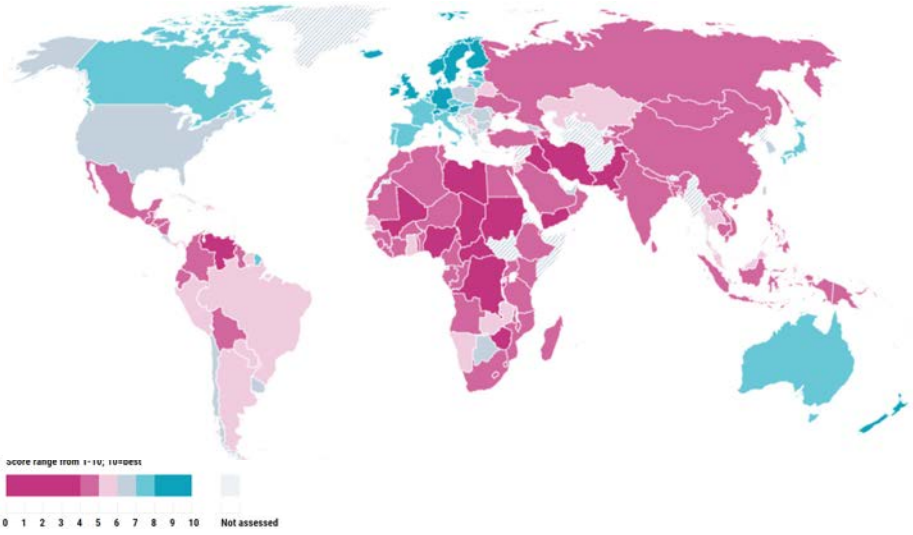
[1] https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2024.pdf

The Country ESG Framework – at a glance

For more than a decade, Robeco has recognized the value of ESG research for sovereign risk analysis. In 2010 we developed the Robeco Country ESG Framework, which systematically aggregates large volumes of complex ESG data into one single country score. The ESG Framework evaluates 150 countries – 23 developed and 127 emerging market and developing economies – on various ESG factors that Robeco considers to be key risk and return drivers relevant for investors.

ESG scores from 150 countries across the globe as per October 2024 are shown on the map below. Superior ESG scores (8.0 and above) reflect countries with robust and well-balanced ESG profiles while the lowest performers are economically, socially, and politically fragile states.

Figure 1 | An overview of global country ESG performance



Data source: Robeco, country ESG scores as of October 2024.

Robeco applies the ESG tool internally to support macro-economic analysis, country allocations, and other investment decisions of our strategies invested in government bonds. In addition to complementing fundamental investment analysis, scores can also be used more broadly to inform engagement activities with governments as well as companies operating in particular jurisdictions. The next section provides more detail on the underlying indicators, criteria and scoring calculations that lead to a final country ESG score.

“ In addition to complementing fundamental investment analysis, ESG scores can also be used more broadly to inform engagement activities with governments as well as companies operating in particular jurisdictions

Country ESG methodology – a closer look

The country score is the final culmination analyses of more than 50 underlying indicators, each based on various data series from the world's foremost institutions for researching, financing, monitoring and advocating sustainable development in developed and emerging markets worldwide. These include development banks, private institutions, NGOs, think tanks, rating agencies and universities. A complete list of data sources is provided in the Appendix.

Underlying indicators are grouped into 15 more generalized categories; four relate to environmental areas, five to social and six to governance. The final country score is the weighted sum of all standardized indicator scores across environmental (weighted 30%), social (30%) and governance (40%) dimensions.

Underlying indicators are chosen based on their influence on a country's ongoing fiscal solvency and economic growth prospects. Research demonstrates the economic importance of ESG indicators such as human rights, climate change, and political instability. They are material for sovereign debt pricing and can be leading indicators for changes in sovereign bond prices. Moreover, the selection and weighting of the individual indicators, criteria and dimensions that determine the final country score are based on expert judgement, evidence from external research, statistical analysis and peer comparisons.

WHAT GETS MEASURED

ENVIRONMENT

Countries can face transition risks and physical risks stemming from climate change and economic decline due to biodiversity loss, harming long-term economic prosperity.

Adequate management of natural resources, preparedness for climate risks, and investments towards renewable energy and broader climate action can mitigate such risks and strengthen competitiveness.

Our framework looks at a variety of factors such as a country's emission profiles, adoption of renewable energy, water and waste management, and its exposure to climate-related hazards.

SOCIAL

A weak social climate dominated by labor unrest, inequality, or other social tensions can undermine countries' resilience.

Countries can strengthen human capital through education, healthcare provisions and social policies that target fair and just outcomes.

We look at key statistics on human capital development such as access to education, healthcare, jobs and social services as well as equity of income, opportunity and the protection of individual rights.

GOVERNANCE

Countries' governance quality is crucial for investors as it directly affects policy stability, transparency, and the effective management of public resources, all of which impact a nation's ability to repay debt and maintain economic stability.

To strengthen governance, countries can enhance institutional transparency, enforce anti-corruption measures, and improve the rule of law to foster greater investor confidence and reduce political risk.

Our framework integrates a broad range of data that considers a country's institutional framework, regulatory quality, rule of law, government efficiency, central bank independence and political stability, among other factors.

Underlying indicators

For each country, we collect and analyze around 50 indicators related to its environmental, social and governance dimensions discussed above.

More than half of these indicators gauge a country's performance and possible risks related to the environment. Criteria measured include data related to biodiversity, climate and energy, water and waste, and their respective vulnerabilities to climate change and natural hazards. For instance, a country's current and future greenhouse gas emissions as well as its share of renewables in its power mix are good indicators of its climate action commitment and potential transition risks exposure amid a shift to a low-carbon economy.

Eleven indicators that include data on aging populations and labor force participation, education and human capital development, human rights and social inequalities as well as its degree of social instability underpin our analysis of a country's social standing. These are grouped into five criteria, including 'Aging', 'Human development', 'Human and labor rights', 'Inequality', and 'Social unrest' which together account for 30% of the overall ESG score.

Finally, 16 sub-indicators measure corruption, personal freedom, policymaking and policy-enforcing institutions, globalization and innovation as well as political risk and stability to capture the strengths and weaknesses of a country's governance structures. The weight of the governance dimension is 40%.

Figure 2 | Robeco Country Sustainability Framework – score components

Indicators		Criteria	Weight	Dimensions	Weight	Country Score
For each country, numerous data series on a variety of ESG features are collected and summarized in >50 indicators. Each indicator gets a predefined weight and a relative score ranging from 1 to 10.		The indicators are aggregated to 15 criteria, whereby each criterion is also assigned a predefined weight.		Each dimension weight is the sum of the criteria weights within the respective dimension.		The Country Score is the weighted sum of all standardized indicator scores.
Forest Cover Net Change Natural Resources Rent Red List Index	Ecological Deficit/Reserve Marine Protected Area Ocean Health Index Terrestrial Protected Area	Biodiversity	7.5%	Environmental	30%	Country ESG Score
Consumption CO2 per Capita GHG Emissions per GDP Consumption CO2 5-Yr p/C Change GHG Emissions 5-Yr p/GDP Change GHG p/C Reduction 2015-30	GHG Emissions per Capita Share of Renewables GHG Emissions 5-Yr p/C Change Share of Renewables 5-Yr Change GHG Emissions p/C Target 2030	Climate & energy	10%			
Integrated Water Management Water Stress Level Water Use Efficiency Waste Management	Wastewater Treatment Water Stress 2030 Projection	Water & waste	7.5%			
ND-GAIN Index	Natural Hazard Index	Environmental risk	5%			
Labor Force Participation Rate 55-64	Old-age dependency ratio 25Y Projection	Aging	7.5%	Social	30%	
Education Human Development Index	Health	Human development	5%			
Global Rights Index	Human rights	Human & labor rights	7.5%			
Gender Inequality Index	GINI Coefficient	Inequality	5%			
Fragile States Index	Socio-economic vulnerability	Social unrest	5%			
Control of Corruption	Corruption Perception Index	Corruption	7.5%	Governance	40%	
Globalization Index	Global Innovation Index	Globalization & innovation	5%			
Government Effectiveness Rule of Law	Regulatory quality	Institutions	10%			
Freedom in the World	Voice & accountability	Personal freedom	5%			
Political Risk Rating ECR	Political Risk Rating PRS	Political risk	7.5%			
Human Hazard	Political stability/No violence	Political stability	5%			

Scoring Overview

In order to make the broad range of data meaningful and comparable, indicators, criteria and dimension values and their weighted averages are standardized in a series of steps using z-score distributions. The final country z-score is converted to a 1 to 10 scale using a statistical formula.

The selected indicators are reviewed periodically based on new evidence and/or data availability. The weighting scheme is also reviewed periodically based on the results of statistical analysis or newly gained empirical evidence, as well as findings from academic research.

An illustrative example of the scoring process is provided in the Appendix.

Reporting the scores

The below figure features the top 25 and bottom countries in our ESG ranking. All country ESG scores as well as scores on the individual ESG dimensions are available through our SI Open Access tool which can be accessed on the Robeco website.

Figure 3 | Top 25 and bottom 5 countries in our ESG ranking

		TOTAL SCORE	DIMENSIONS			1Y CHANGE	
	Country	Score ↓	40% weight Governance	30% weight Environmental	30% weight Social	Score Δ	Rank Δ
1.	Finland	9.07	8.62	9.25	8.54	+0.17	0 —
2.	Norway	9.07	8.38	9.50	8.61	+0.26	2 ↗
3.	Sweden	9.06	8.44	9.52	8.47	+0.18	1 ↘
4.	Denmark	8.97	8.55	9.04	8.54	+0.14	1 ↘
5.	Switzerland	8.77	8.65	8.54	8.27	+0.23	1 ↗
6.	Iceland	8.68	8.08	8.53	8.78	+0.05	1 ↘
7.	Austria	8.34	7.86	8.39	8.17	+0.40	9 ↗
8.	Germany	8.32	8.08	8.06	8.16	+0.30	5 ↗
9.	Netherlands	8.32	8.34	7.60	8.26	+0.17	1 ↘
10.	Luxembourg	8.12	8.20	7.64	7.80	+0.01	1 ↗
11.	Estonia	8.12	7.71	8.39	7.68	+0.16	3 ↗
12.	Ireland	8.04	7.98	7.47	8.02	-0.08	3 ↘
13.	United Kingdom	8.01	7.82	8.59	7.02	+0.20	4 ↗
14.	New Zealand	7.98	8.29	6.78	8.10	-0.47	7 ↘
15.	France	7.83	7.53	7.85	7.59	+0.30	4 ↗
16.	Japan	7.74	7.83	7.19	7.58	+0.29	4 ↗
17.	Canada	7.69	7.98	6.70	7.71	-0.42	7 ↘
18.	Slovenia	7.63	7.07	7.29	8.14	+0.51	7 ↗
19.	Belgium	7.61	7.71	6.94	7.59	+0.04	1 ↘
20.	Australia	7.53	8.16	6.21	7.46	-0.52	8 ↘
21.	Czech Republic	7.50	7.30	7.03	7.70	+0.12	0 —
22.	Lithuania	7.45	7.07	7.54	7.36	+0.18	1 ↗
23.	Latvia	7.35	6.95	7.50	7.25	+0.26	3 ↗
24.	Portugal	7.35	7.36	6.66	7.52	+0.30	4 ↗
25.	Singapore	7.30	8.19	5.78	7.15	-0.65	10 ↘
146.	Sudan	2.96	2.86	3.79	3.00	-0.19	0 —
147.	Iran	2.89	3.64	1.80	3.74	-0.21	0 —
148.	Iraq	2.89	3.14	2.27	3.93	-0.16	0 —
149.	Libya	2.64	3.05	1.86	3.70	-0.03	1 ↗
150.	Yemen	2.54	2.56	3.85	2.06	-0.19	1 ↘

Data source: Robeco, country ESG scores as of October 2024.

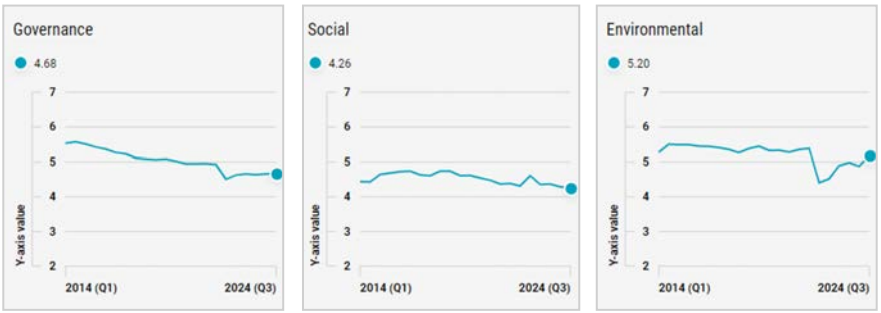
ESG ratings – data-driven, powerfully predictive

Türkiye's tumble

It seems obvious that robust ESG performance promotes economic growth, contributes to a healthy fiscal position and ultimately to a stronger, long-term sovereign credit profile. The opposite is also true; institutional failures, political upheavals, social disparities or pronounced inequalities undermine political and macroeconomic stability.

Türkiye serves as an illustrative example. Its ESG scores have spiraled downward since 2014, when its authoritative and nationalistic president, Recep Tayyip Erdogan, came to power. Adverse impacts are visible in Türkiye's weak political risk and stability, personal freedom, and institutions' scores, but also in human and labor rights marks within the social sphere (see Figure 4). By taking control of constitutional powers and interfering in economic policymaking, Erdogan has increasingly undermined state institutions and contributed to the economic woes and financial turbulence of recent years.

Figure 4 | Türkiye's ESG performance: back-sliding



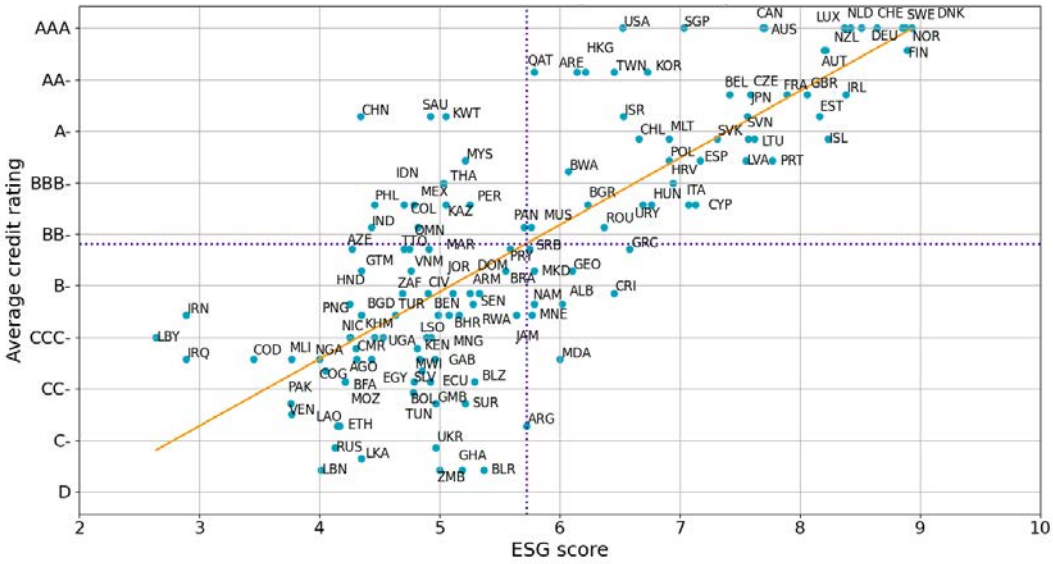
Data source: Robeco; data assessed as of October 2024. Data note: The chart displays Türkiye's ESG scores development from 2014 through today (Q3 2024). Türkiye has lost ground across the individual E, S, and G dimensions since 2014.

Türkiye is just one in a universe of examples where a country's ESG profile and ESG scores helped to predict future turmoil and sovereign risks. Figure 5 illustrates this also on a broader sample of countries (n=129), where a fairly high positive correlation (0.78) between Robeco's country ESG scores and sovereign credit ratings is observed.

ESG ratings versus credit ratings

Country ESG data contains risks that are not always obvious (and probably not sufficiently captured) in traditional sovereign credit risk analyses, which are still more focused on macroeconomic and debt-servicing variables. Hence, there will be differences in perceived risks between country ESG performance and sovereign bond ratings, which explains why the correlation between these is positive though not perfect (0.79).

Figure 5 | Robeco country ESG scores reflective of sovereign credit risk ratings



For example, in Figure 5, the correlation between ESG scores and bond ratings is strongly positive (0.79). In the case of Greece, Iceland, and Portugal, however, the sovereign credit ratings appear too conservative relative to their ESG scores, suggesting the potential for an upgrade of sovereign ratings. On the other hand, China, India, and the US enjoy sovereign ratings that seem stronger than implied by their ESG profiles. Russia stands out among many recent examples of the investment risks in a country with a weak and/or rapidly deteriorating ESG profile. After its abrupt incursion into Ukraine, the big three sovereign ratings providers first withdrew ratings on Russian sovereigns later downgraded it default status. The country's average sovereign rating – marginally above BBB- before the start of the invasion in Ukraine – appeared too high relative to the country's ESG score at that time (4.71).

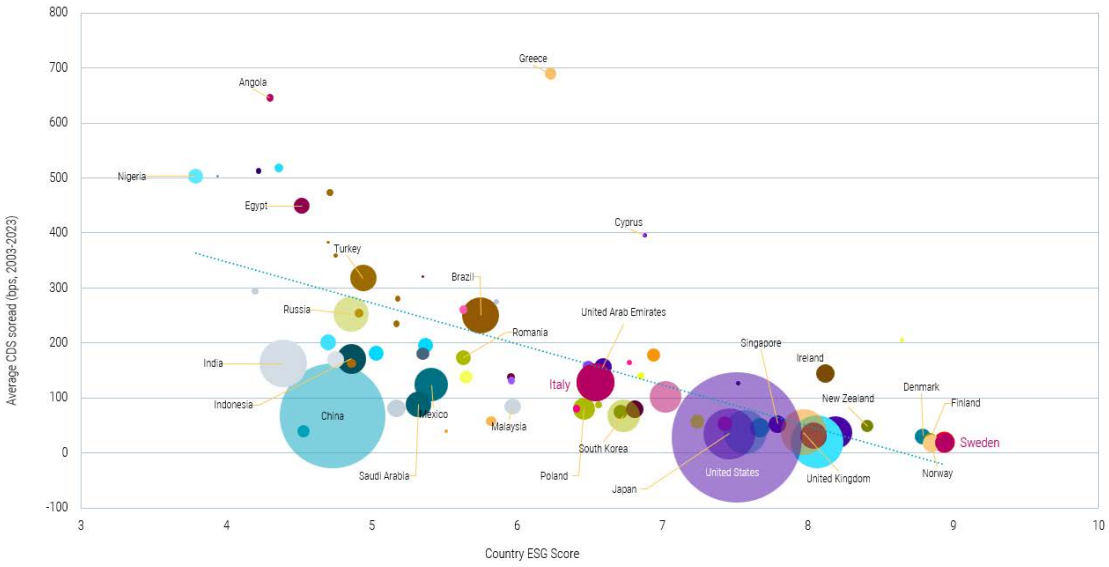
Higher ESG ratings coincide with lower default risk

Given their usefulness as a signal for a country's overall creditworthiness, it would also follow that a country's ESG scores would have a strong negative correlation with a sovereign's probability of default as measured by credit default swaps (CDS). CDS can provide fixed income investors with protection against a country's default on its debt. In essence, CDS spreads serve as an insurance premium: the riskier the investment, the higher its spread. A high country ESG score on the other hand represents lower ESG risk and would therefore imply a lower insurance premium and a lower CDS spread.

Figure 6 displays an overview of how countries' ESG score relates to their CDS spreads, which validates our assumption of the robust correlation between ESG performance and measures of its potential risk of default. An upward or downward trend in the ESG scores signal potential moves in the pricing of sovereign credit risk. In numerical terms – considering the average CDS spread is 196 – a 0.1 higher country ESG score is on average associated with a 10 bps lower level of the average CDS spread.

As with credit ratings, the negative correlation between country ESG scores and CDS spreads is not perfect; some countries show lower CDS spreads relative to their ESG profile and vice versa.

Figure 6 – Average CDS spread and country ESG rating for each country, size of bubble represents GDP

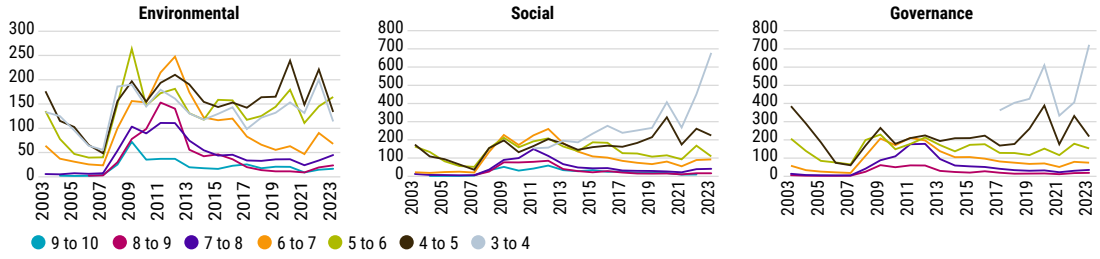


Source: Robeco. In the 83 countries analyzed between 2003 and 2023, we find a statistically significant negative relationship between their country ESG ratings and 5-year CDS spreads. This relationship stands after controlling for various macroeconomic and financial variables such as GDP/capita, GDP growth, fiscal balance, inflation, debt, current account, reserves and export ratios. These robustness checks are crucial to demonstrate that the relevance of sovereign ESG is not merely coincidental or due to omitted variable bias, but holds true across different conditions.

Strong governance scores associated with lower CDS spreads

We also looked beyond overall ESG scores and sought to identify which individual pillar primarily drives the negative relation between ESG scores and CSD spreads. The findings indicate that governance is the main driver, as countries with stronger governance practices tend to have narrower CDS spreads, reflecting enhanced investor confidence and reduced sovereign credit risk. In contrast, no significant relationship was found between environmental scores and CDS spreads, while social scores showed a weaker but present relationship, with improvements in social scores linked to lower default risk.

Figure 7 | Average default risk per E, S, and G pillar



Source: Robeco.

Integration in investments

Quant Fixed Income

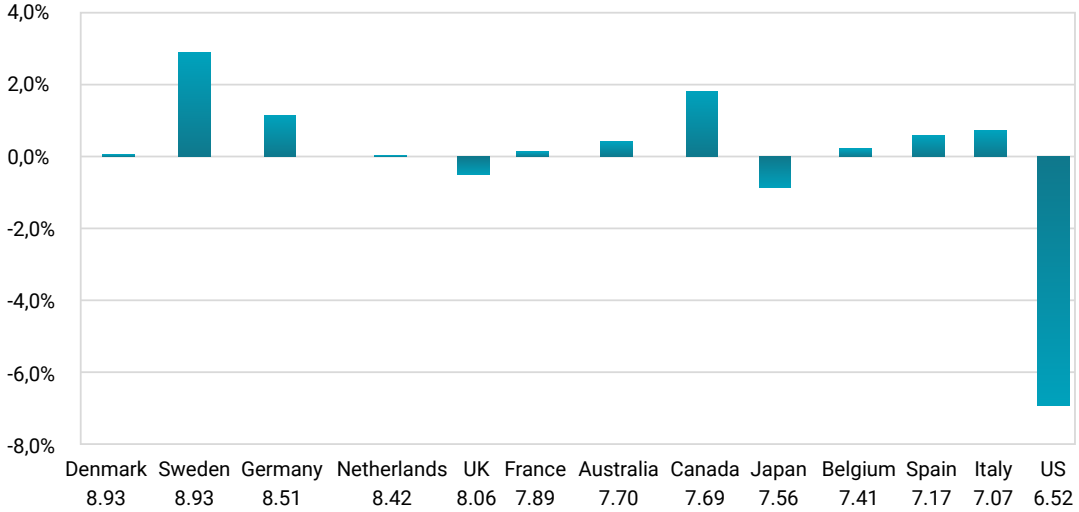
The country ESG scores are integrated in all Robeco quant government bond and quant aggregate fixed income strategies, including the Global Dynamic Duration and Global Multi-Factor Bond products. In these portfolios, we select bonds based on alpha-generating factors such as value, momentum, and low risk. While selecting government bonds that are attractive from an alpha generating perspective, we require the portfolio to have a better ESG profile than the reference index. This means that both the weighted average country ESG score and the per capita GHG emissions of the government bonds in the portfolio must be better than those of the respective benchmark.

Effect on country allocation

Our portfolios' superior ESG profile compared to the index is evident from the average country weights relative to the benchmark. On average, we overweight countries such as Sweden with higher country ESG scores and tend to underweight countries such as the US with lower scores.

Moreover, ESG characteristics are assessed on a portfolio level. This means that while it is harder to overweight lower performing countries, it is allowed. This is clear when we look at the weights of Spain and Italy in the portfolio. In terms of emissions per capita this improves the portfolio scores because these countries have relatively low emission intensities. However, these countries have lower ESG scores compared to their European counterparts. As such, we compensate for their low (positive) scores by underweighting US government bonds (see Figure 8).[2]

Figure 8 | Robeco Dynamic Duration cash government bond portfolio is on average overweight in countries with high ESG scores relative to the benchmark



Source: Robeco, Bloomberg. Note: The graphic displays by how much the Global Dynamic Duration portfolio is on average under- or overweight compared to a comparable government benchmark. Figures are derived from the difference between the average country weights of government bonds in the portfolio minus the average country weights of government bonds in the benchmark, the JPM GBI Global Investment Grade Index. Numbers between brackets are the scores from the latest Country ESG Ranking. Results are based on historical simulations of the government bond portfolio in the Global Dynamic Duration strategy from January 2001 to October 2024. The value of your investments may fluctuate. Results obtained in the past are no guarantee for the future.

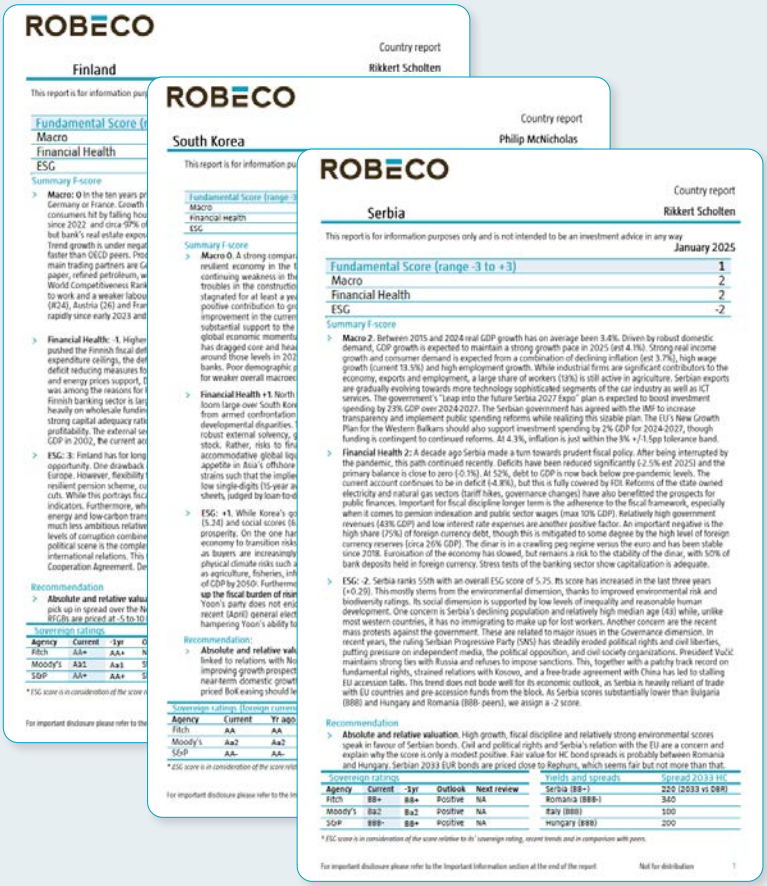
[2] For more information on how we integrate sustainability in our Quant Fixed Income solutions, please refer to Penninga, Houweling, Van Der Linden, 2022, Integrating sustainability in Global Multi-Factor Bonds.

Global Macro: fundamental sovereign investing

We see the Country ESG Ranking as a starting point for the analysis of ESG risks and opportunities for government bonds. After every update of the ranking, which takes place twice a year, we will discuss which countries have improved or deteriorated their ESG score and what could explain this. The ESG information that we collect ourselves is not available via the usual newswires and is thus easily overlooked.

To build a longer term perspective and prepare longer term decision making we construct country reports. These reports describe the results of a country analysis based on three dimensions: 1) macroeconomic outlook, 2) financial health, and 3) ESG performance, where we look at changes in countries' scores relative to peers with a similar credit rating. These three components culminate in an F-score – which ranges from -3 to +3 – and which is used to formulate an assessment on the relative attractiveness of the sovereign bonds versus peers. The reports are discussed among the portfolio managers and strategists. Incorporating ESG-related insights into the investment analysis gives us additional information, which helps in formulating investment propositions in a country.

ESG information plays a role in investment decisions when deemed relevant. For instance, we incorporate them into country allocation decisions, but not into yield curve decisions. ESG is an integral part of our country analysis, but it is not the only criterion. Hence not every position can be explained by ESG factors only.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Finland

Country report

Rikkert Scholten

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South Korea

Country report

Philip McNicholas

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Serbia

Country report

Rikkert Scholten

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January 2025

Fundamental Score (range -3 to +3)	1
Macro	2
Financial Health	2
ESG	-2

Summary F-score

- **Macro 2**. Between 2015 and 2024 real GDP growth has on average been 3.4%. Driven by robust domestic demand, GDP growth is expected to maintain a strong growth pace in 2025 (est 4.1%). Strong real income growth and consumer demand is expected from a combination of declining inflation (est 3.7%), high wage growth (current 13.5%) and high employment growth. While industrial firms are significant contributors to the economy, exports and employment, a large share of workers (19%) is still active in agriculture. Serbian exports are gradually evolving towards more technology sophisticated segments of the car industry as well as ICT services. The government's "Leap into the future Serbia 2027 Expo" plan is expected to boost investment spending by 23% GDP over 2024-2027. The Serbian government has agreed with the IMF to increase transparency and implement public spending reforms while realizing this sizable plan. The EU's New Growth Plan for the Western Balkans should also support investment spending by 2% GDP for 2024-2027, though funding is contingent to continued reforms. At 4.3%, inflation is just within the 3% +/1.5pp tolerance band.
- **Financial Health 2**: A decade ago Serbia made a turn towards prudent fiscal policy. After being interrupted by the pandemic, this path continued recently. Deficits have been reduced significantly (-2.5% est 2025) and the primary balance is close to zero (-0.1%). At 52%, debt to GDP is now back below pre-pandemic levels. The current account continues to be in deficit (-8.8%), but this is fully covered by FDI. Reforms of the state owned electricity and natural gas sectors (tariff hikes, governance changes) have also benefitted the prospects for public finances. Important for fiscal discipline longer term is the adherence to the fiscal framework, especially when it comes to pension indexation and public sector wages (max 10% GDP). Relatively high government revenues (43% GDP) and low interest rate expenses are another positive factor. An important negative is the high share (75%) of foreign currency debt, though this is mitigated to some degree by the high level of foreign currency reserves (circa 26% GDP). The dinar is in a crawling peg regime versus the euro and has been stable since 2018. Euroisation of the economy has slowed, but remains a risk to the stability of the dinar, with 50% of bank deposits held in foreign currency. Stress tests of the banking sector show capitalization is adequate.
- **ESG: -2**. Serbia ranks 55th with an overall ESG score of 5.75. Its score has increased in the last three years (+0.29). This mostly stems from the environmental dimension, thanks to improved environmental risk and biodiversity ratings. Its social dimension is supported by low levels of inequality and reasonable human development. One concern is Serbia's declining population and relatively high median age (43) while, unlike most western countries, it has no immigrating to make up for lost workers. Another concern are the recent mass protests against the government. These are related to major issues in the Governance dimension. In recent years, the ruling Serbian Progressive Party (SNS) has steadily eroded political rights and civil liberties, putting pressure on independent media, the political opposition, and civil society organizations. President Vučić maintains strong ties with Russia and refuses to impose sanctions. This, together with a patchy track record on fundamental rights, strained relations with Kosovo, and a free-trade agreement with China has led to stalling EU accession talks. This trend does not bode well for its economic outlook, as Serbia is heavily reliant of trade with EU countries and pre-accession funds from the block. As Serbia scores substantially lower than Bulgaria (BBB) and Hungary and Romania (BBB- peers), we assign a -2 score.

Recommendation

- **Absolute and relative valuation**. High growth, fiscal discipline and relatively strong environmental scores speak in favour of Serbian bonds. Civil and political rights and Serbia's relation with the EU are a concern and explain why the score is only a modest positive. Fair value for HC bond spreads is probably between Romania and Hungary. Serbian 2033 EUR bonds are priced close to Rephuns, which seems fair but not more than that.

Sovereign ratings

Agency	Current	-1yr	Outlook	Next review
Fitch	BB+	BB+	Positive	NA
Moody's	Ba2	Ba2	Positive	NA
S&P	BBB-	BB+	Positive	NA

Yields and spreads	Spread 2033 HC
Serbia (BB-/-)	220 (2033 vs DBR)
Romania (BBB-)	340
Italy (BBB)	100
Hungary (BBB)	200

* ESG score is in consideration of the score relative to its' sovereign rating, recent trends and in comparison with peers.

For important disclosure please refer to the Important information section at the end of the report

Not for distribution

Governance – revisions and maintenance

Ongoing maintenance

The world is rapidly changing. Latent risks are escalating and unforeseen risks are emerging at increasingly swift speeds. The ESG framework is continuously reviewed to ensure results accurately reflect current realities and future risks. Relatedly, we explore new ESG data and indicators based on whether these have good coverage, are robust and from trustworthy sources, are financially material, and updated at least on an annual basis.

Moreover, we welcome external feedback from our Country ESG score users and the wider world through our SI Open Access initiative. Such feedback will enable us to capture more relevant dimensions and further enhance the quality and reliability of ESG scores for the investment community.

Operational oversight

The job of ensuring the framework's continuous data quality and relevance require input from and alignment between several important stakeholder groups. The governance around Robeco's Country ESG Framework is as follows:

Country Sustainability Governing Body: Ultimately responsible for changes and final structure of the Country ESG Framework and its underlying methodology; it consists of Robeco's SDG Strategist, Country Sustainability Specialist and Head of ESG Integration.

Country ESG Operations: Provide continuous operational oversight of all functions related to the Country ESG Framework.

Country Sustainability Committee: Advise the Country ESG Governing Body on proposals for the Country ESG Framework, review ESG score distributions, and ensure effective implementation of ESG scores. Members include representatives from investment teams that apply the ESG scores and Robeco's Head of Active Ownership.

Sustainable Investing Model Oversight Committee (SMOC): Ensures consistency across Robeco's SI models and maintain strategic oversight on the appropriateness and integration of all SI models.

Compliance: Monitor decisions made by the Country Sustainability Governing Body and ensure compliance with approved procedures.

Conclusion

The Country ESG Framework is built on Robeco's conviction that a country's ability to safeguard the needs of its future generations encompasses a broad range of environmental, social, economic and governance objectives. In addition to evaluating a country's access to and management of its natural resources such as carbon emissions and biodiversity, our methodology considers a number of social factors such as investments in education and health, and governance factors such as quality of institutions, political rights and civil liberties.

Such factors are frequently overlooked by investors but have a direct impact on a country's economic performance and ultimately its long-term investment profile. If not mitigated, ESG factors can adversely affect and further erode trust in countries' social and institutional structures. If countries fail to adequately and proactively address long-term challenges in these areas, they can eventually develop into pressing issues that require immediate action to prevent or contain damage to economic and political development.

The Robeco Country ESG Framework is designed to complement traditional sovereign risk assessments carried out by rating agencies. As such, it forms the basis for incorporating ESG risk analysis into the portfolio construction process of Robeco's sovereign debt as well as many other investment strategies that rely on macro-economic data at the country level. Moreover, it is informs data-driven engagements with sovereign governments on ESG issues and needed reforms.

"Used in combination with traditional country risk analysis, our Country ESG Framework can be a powerful tool for better-informed investment decisions

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Quant Fixed Income Researcher

Rikkert Scholten
Global Macro Strategist

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Appendix

I COUNTRY ESG SCORES: CRITERIA DEFINITIONS

Environmental

Biodiversity Biodiversity is crucial for human well-being, livelihoods, economies, and the health of the planet as a whole. It underpins human health, global nutrition, and food security as it provides genetic resources for all crops, livestock and marine species harvested for food. It benefits business and the economy as a significant part of the world's GDP is dependent on nature. Biodiversity also acts as a buffer against natural disasters and mitigates climate change. A loss of biodiversity is therefore a key risk for the environment and for humanity.

Climate & energy Climate change provides an assessment of a country's performance in combating climate change and promoting renewable energies. This criterion is one of the biggest threats to the environment, to people and to the global economy. Warmer weather, rising sea levels and more frequent and extreme weather events are negatively affecting human health, livelihood, productivity, basic infrastructure, as well as various economic sectors such as agriculture, forestry, fishery, and tourism. In this way, climate change can contribute to falling incomes, spreading poverty, increasing involuntary migration, and even triggering sociopolitical conflicts, illustrating the need for decisive climate action.

Environmental risk All countries are exposed to and impacted by climate change, weather-related events and natural disasters such as cyclones, earthquakes, floods, forest fires, heat waves, hurricanes, storms, typhoons, volcanic eruptions etc. This criterion provides an assessment of the impact of such events both in terms of fatalities and economic losses. These events can lead to severe disruptions in the availability and production of goods and services and thus result in adverse macroeconomic effects such as inflation, growth slowdown, export losses or debt servicing problems.

Water & waste Water is a vital natural resource that is needed for all life to exist. It is irreplaceable for use in agriculture, industrial, household, leisure, and environmental activities. However, water is also a scarce resource and widespread water stress contributes to food shortages, causes human displacement and leads to political instability. Water conservation and effective water management is therefore an urgent need. Similarly important is a sparing use of other natural resources and proper waste management.

Social

Aging A rapidly aging population poses significant challenges for an economy. It will cause a shrinking workforce, lead to a shortage of labor, a decline in productivity, a reduction of capital investments, and therefore reduce a country's economic growth potential. In addition, it is likely to result in lower income tax revenues, lead to increased government spending on health care and pensions, and thus cause a growing fiscal burden.

Human development Education and health are key pillars for a prosperous economy and society. The accumulation of human capital affects the level of skilled labor and thus the productive capacity of an economy. The better educated and healthier the population, the more innovative and productive the workforce. Access to effective education and health systems is therefore crucial for achieving and supporting a reasonable level of economic development, per capita income, and general well-being. Economic and human development are highly complementary – growth will enhance human development, and human development will promote growth.

Human & labor rights Human rights affect every area of human activity. They include civil and political rights, which refer to an individual's right to participate in the political life. Freedom and participation rights also extend to the cultural, economic, and social spheres, including rights such as access to education, health, and labor. While the exact effect of basic human rights on economic growth is still a subject of dispute, freedom, participation, property rights as well as equal access to education and health appear to have a positive impact on growth. As an individual's opportunities grow and as they enjoy greater freedom, they will make better use of their capabilities and resources, creating a positive aggregate impact on the overall economy.

Inequality In general terms, there is a negative relationship between income, wealth inequality and economic growth. Extreme inequality can hamper consumption, investment in human capital, and may promote populist economic policies, hampering the economy over time. A second component of this criterion relates to gender inequality. Gender equality is when people of all gender identities have equal rights, responsibilities, and opportunities. Improving gender equality is also important for economic prosperity and gender-equal societies are usually healthier and safer.

Social unrest Research shows that the risk of violent protests, riots, and social unrest is higher in countries that are lagging in terms of economic development. Underdevelopment is more likely to cause social unrest, which tends to decline with ongoing economic growth and a growing level of happiness. Social conflict, in turn, can impose considerable economic and social costs, weaken state institutions, lead to greater uncertainty, cause political instability, and thus impair economic growth.

Governance

Corruption Corruption has many different shapes and can have various effects on the economy, the political environment as well as on society in general, as it lowers trust in the government, institutions, and the rule of law. In the economy, corruption can have negative implications on growth as it affects the business climate, causes higher costs, reduces investment and tax revenues, tilts public spending toward projects more susceptible to bribes, and leads to lower quality of public goods and services.

Globalization & innovation Even though research findings on the relationship between globalization and innovation are partly contradictory, there is quite some evidence for positive interlinkages. Globalization can spur innovation through the spread of knowledge and technology across borders. It increases competition and forces the adaptation of productivity-enhancing technologies, which can enhance a country's international competitiveness and economic prosperity. This in turn will allow further investments in human capital and modern infrastructure, thereby further advancing the innovation process.

Institutions Research shows that institutional organizations matter a great deal in determining a country's economic development and growth. Protection of property rights, effective law enforcement, efficient public administration, civil liberties, and a wide range of similar norms appear strongly correlated to a superior economic performance. This results from the positive impact of robust institutions, which tend to reduce transaction costs, lower risk and uncertainty, spur investment, and increase incomes.

Personal freedom The degree of human freedom and human rights has a vital role in economic prosperity. Countries that respect human freedom and rights create a predictable environment for economic actors and this, in turn, is positive for investment, productivity and the creation of welfare. With greater human and economic freedom, markets tend to perform more efficiently, and individual actors benefit from more opportunities, which also contributes to improving overall life satisfaction.

Political risk Political risk is broad, multi-faceted and includes features such as government politics, the political and electoral system, and the existence of checks and balances. It is obvious that there is a strong relationship between the political environment and economic development, as businesses, financial markets and the economy are impacted by a variety of political decisions, such as taxes, government spending, regulations, fiscal and monetary policy, exchange rate and investment controls, labor laws, trade policies and tariffs, and environmental laws.

Political stability This criterion measures the risk of sudden and disruptive political changes, or lingering instability. Instability can result from underlying socio-political tensions, abrupt and/or radical change in government, military coups, ethnic and religious conflicts, or foreign interference. Instability impairs economic policymaking, affects domestic and foreign investment, and can hurt economic activity in many other ways.

Appendix

II. COUNTRY SCORE CALCULATION

In order to make the broad range of distinct data comparable, data for each indicator is reviewed, transformed, where necessary, and then normalized into a z-score. Z-scores are a useful tool for standardizing disparate data points into a common, easy-to-read scale based on the dataset's average and a data point's standard deviation from that average within a normal distribution. As such, z-scores range between -3 to +3. Each time we aggregate data points at a new level – whether indicator, criteria, dimension, or total country score – we use a weighted average of the underlying z-scores to then again calculate a new z-score. This statistical step is necessary because the distribution of the average weighted z-scores is no longer a z-score in terms of the distribution of the outcome.

Without this step, the weights would no longer be properly reflected in the overall score. Please note: Final country scores range from 1 to 10 (1=lowest, 10=highest). This final score is not simply a weighted average of the E, S, G dimension scores. It is rather the country-level z-score obtained from the steps outlined above that has been converted into an easily recognizable scoring range using a statistical formula. The scoring process – from base level indicators to final country ESG score – is shown below using Italy as example.

COUNTRY SCORE CALCULATION: EXAMPLE OF ITALY

Dimension level z-scores are derived by normalizing the weighted average of z-scores at the criteria level.

For Italy, the dimension level z-scores are Environmental: 0.661, Social: 1.261, and Governance: 0.938. Respective ESG scores are then converted into a scale from 1-10 using the formula below*. This results in scores of 6.49, 7.39, and 6.91 for the Environmental, Social, and Governance dimension respectively.

To get from the dimension level z-scores to the total country score, we calculate the weighted average of the dimension z-scores using 30%, 30%, and 40% as weights for Environmental, Social and Governance respectively.

This yields a weighted average of 0.952. Then, we again perform the normalization using z-scores to arrive at 1.044 as the z-score for the total country score. In the final step, we convert the country z-score (0.988) into a scale from 1-10 again using the below formula which yields a total country score of 7 (rounded from 7.07) for Italy.

***Formula to convert country z-scores to a 1-10 scale = 1 + ((z-score + 3) * 1.5)**

DATA PREPARATION

Step 1

Government Effectiveness
Raw value: 0.45
Transformation: not required

Rule of Law
Raw value: 0.30
Transformation: not required

Regulatory Quality
Raw value: 0.51
Transformation: not required

INDICATOR LEVEL

Step 2

Government Effectiveness
z-score of this metric: 0.573
(-3 to +3)

Rule of Law
z-score of this metric: 0.500
(-3 to +3)

Regulatory Quality
z-score of this metric: 0.579
(-3 to +3)

CRITERIA LEVEL

Step 3

Institutions
Weighted average of the two indicator z-scores: 0.55

Step 4

Government Effectiveness
z-score for this criterion: 0.441

Other governance criteria

Corruption
z-score: 0.624

Globalization & Innovation
z-score: 1.193

Institutions
z-score: 0.441

Political Risk
z-score: 1.225

Political Stability
z-score: 0.857

DIMENSION LEVEL

Step 5

Governance
Weighted average of the six criteria z-scores: 0.858

Step 6

Governance
New z-score for this dimension: 0.938

Other dimensions

Environmental
z-score: 0.661

Social
z-score: 1.261

COUNTRY LEVEL

Step 7

Country CSR Score
Weighted average of the dimension z-scores: 0.952

Step 8

Country CSR Score
New z-score for the country total: 1.04

Step 9

Final Country ESG Score
Conversion of z-score into the final ESG score: 7.07

Source: Robeco. Data as of October 2024

ROBECO
The Investment Engineers

Please visit the Robeco website
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