



SOVEREIGN ISSUERS

ESG analysis at ODDO BHF AM

DECEMBER 2019



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« A 'sustainable' country must guarantee its citizens' basic freedoms, invest in their development and the development of future generations, and respect the environment. »

The profile of sovereign issuers is generally assessed on the basis of traditional macro financial indicators, such as change in GDP, private consumption, public and private investment, industrial output, inflation, and unemployment rates.

However, in an increasingly complex world whose equilibria are in constant flux and in order to have the most comprehensive view possible of country risk, we felt it was important to supplement this approach with an ESG analysis based on a proprietary model that assesses sovereign issuers.

Regarding the three underlying forces that have characterised the past decades – climate change, demographics, and rising protectionism – it is worth pointing out that history is full of government bankruptcies, due most often to the rarefaction depletion of resources such as water, energy, and agricultural commodities, and to social inequalities.

As part of its constant effort to integrate sustainable development criteria into the various asset classes it invests in, ODDO BHF Asset Management compiled a sample of 65 countries (35 developed and 30 emerging) that account for the vast majority of currently outstanding sovereign debt.



Methodology

Similar to how it assesses companies, ODDO BHF Asset Management's macro-sustainable development methodology is rooted in the Brundtland report of 1987¹, which defined the concept of "sustainable development", and in the principles of the United Nations Global Compact², which were formalised in 2000, i.e., human rights, basic labour rights, the environment and efforts to combat corruption.

« Sustainable development is a development model that meets the needs of current generations without compromising the ability of future generations to meet theirs. »

10 themes structured around SDGs

In September 2015, the 193 United Nations member-countries adopted Agenda 2030, including the setting of 17 Sustainable Development Goals (SDGs)³. All countries were called upon to implement this universal agenda and to meet the most important economic, social, environmental and governance challenges of our time.

The SDGs are now acknowledged as a benchmark framework in which countries can base their sustainable development strategies, and are the foundation of our ESG research model for sovereign issuers.

Our research framework is built around 10 themes (three Environment themes, four Social ones and three Governance ones), with each block being split into several criteria within the model. We have weighted the blocks as follows: 30% for the Environment, 30% for Social and 40% for Governance.

¹ See Glossary

² See Glossary

³ See Glossary



Source: ODDO BHF AM SAS, November 2019

A research model based on solid benchmark sources

Our research uses solid references, including international institutions, such as the World Bank, the United Nations, the FAO, OECD, and the International Energy Agency), NGOs (Transparency International and Freedom House) and universities (University of Stuttgart, Germany, and Johannes Kepler University, Austria).



Environment

We used 13 criteria for the three themes within the Environment block, which are weighted as follows: energy (6%), climate (10%) and resources (14%).

To cite one example, the climate theme's most heavily weighted criterion is the Physical Vulnerability to Climate Change Index (PVCCI), produced by the Foundation for Studies and Research on International Development (FERDI). We have done so because the increasingly perceptible impacts of climate change, and even the risk of a runaway scenario, make it essential to review the physical risks that each country is exposed to. The PVCCI includes both the risks from gradual shocks (such as



flooding due to higher sea levels or the melting of the glaciers, and increasing aridity), and risks from increasingly intense recurring shocks in precipitation, temperatures, and storms.

In the resources theme, among the criteria we looked at is the Red List Index (RLI), put out by the International Union for Conservation of Nature (IUCN). This is an indicator of shifts in global biodiversity, including the degree of protection of animal and plant species, and a measure of their risk of extinction over time. The index was created in 1964 and is updated every five years.



Social

We reviewed 15 criteria in the Social block, which was split into the four themes of healthcare (7%), education (7%), inequalities (10%) and employment (6%).

In healthcare, we have used, for example, an indicator of the World Health Organisation (WHO) that measures how well the population of a given country is covered by basic healthcare services, including financial protection, access to essential services, quality of healthcare, and universal vaccination).

On the education theme, we have integrated World Bank data on public education spending (current spending and investments as a percentage of GDP) into our model.

Regarding inequalities, we looked at indicators such as access to electricity, as reported by the World Bank and the International Energy Agency, as that is considered to be a basic need for a decent standard of living.



Governance

In the governance block we reviewed eight criteria around three themes: the rule of law (12%), institutions (10%) and the economy (18%).

We assign a significant weighting (8%) to the corruption perceptions index reported annually by Transparency International, an NGO. This index ranks countries by their perceived level of public-sector corruption in basic areas such as the holding of free elections, freedom of assembly, and access to independent judicial system.

Among the criteria of economic competitiveness, we believe that the index measuring the weight of a country's informal economy, as calculated by Johannes Kepler University in Austria, is quite relevant. "Informal economy" means any production of goods and services that deliberately side-steps the payment of taxes and duties, employer contributions, or labour legislation.

Macro-ESG research model

| Block | Theme | Criterion | Source | Weighting |
|---------------------------------------|--------------|---|--|-----------|
| Environment | Energy | Energy independence | International Energy Agency | 2,0 |
| | | Share of renewables in energy mix | World Bank | 2,0 |
| | | Energy consumption | World Bank | 2,0 |
| | Climate | Carbon intensity of growth | World Bank | 2,0 |
| | | CO2 emissions | World Bank | 2,0 |
| | | PVCCI risk index | FERDI | 6,0 |
| | Resources | Food self-sufficiency | Food and Agriculture Organisation | 1,5 |
| | | Arable land | World Bank | 1,5 |
| | | Rate of particles in the air (PM2.5) | World Bank | 2,0 |
| | | Pressure on water resources | Food and Agriculture Organisation | 4,0 |
| | | Protected areas | Nations-Unies | 1,0 |
| | | Forests | Food and Agriculture Organisation | 1,0 |
| | | RLI index of protection of biodiversity | International Union for the Conservation of Nature | 3,0 |
| Social | Healthcare | Life expectancy at birth | World Bank | 2,0 |
| | | Obesity | World Health Organisation | 1,5 |
| | | Universal health coverage | World Health Organisation | 2,0 |
| | | Fertility rate | World Bank | 1,5 |
| | Education | PISA rankings | Programme for International Student Assessment | 1,5 |
| | | Access to primary education | World Bank | 2,0 |
| | | Average duration of education | World Bank | 1,5 |
| | | Public education expenditure | World Bank | 2,0 |
| | Inequalities | GINI index | World Bank | 4,0 |
| | | Access to electricity | World Bank/International Energy Agency | 2,0 |
| | | Water, sanitation and hygiene | World Bank | 2,0 |
| | | Internet access | World Bank | 2,0 |
| | Employment | Workforce participation | World Bank | 2,0 |
| Youth unemployment | | World Bank | 2,0 | |
| Percentage of women on the job market | | World Bank | 2,0 | |
| Gouvernance | Rule of law | Global peace index | Institute for Economics and Peace | 2,0 |
| | | Freedom worldwide | Freedom House | 2,0 |
| | | Index of perception of corruption | Transparency International | 8,0 |
| | Institutions | Government efficiency | World Bank | 4,0 |
| | | Political stability and non-violence | World Bank | 6,0 |
| | Economy | Index of global competitiveness | World Economic Forum | 4,0 |
| | | Informal economy worldwide | Johannes Kepler University | 8,0 |
| | | Public debt per young person (< 14 years) | World Bank | 6,0 |

Source: ODDO BHF AM SAS, November 2019

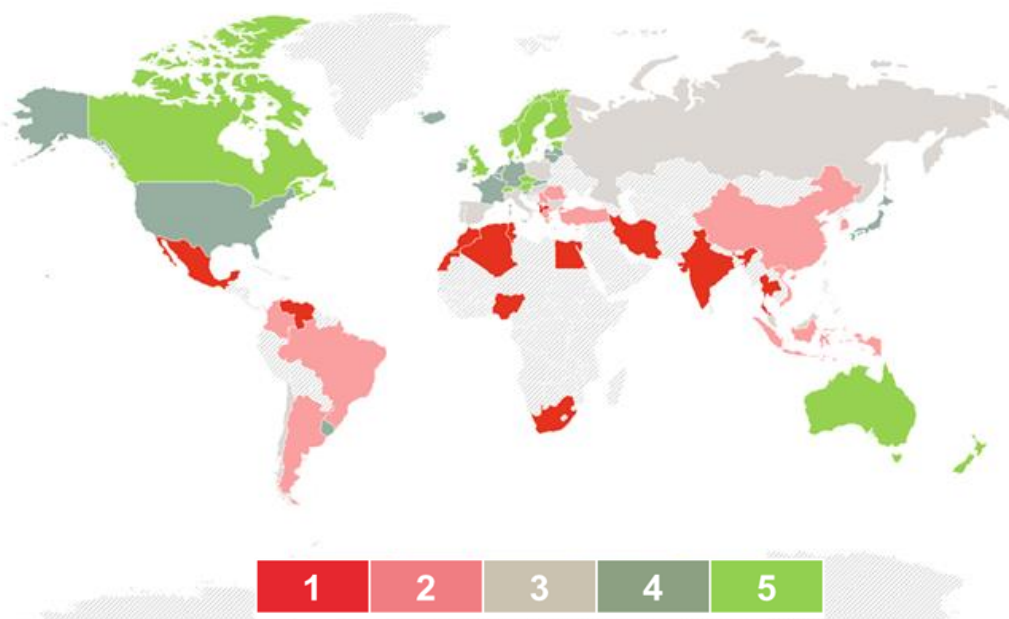


Findings

Northern Europe's virtuous model

Unsurprisingly, Northern European countries dominate the upper part of the rankings (Sweden, Norway, Denmark, Finland, Estonia). Their virtuous social models and solid institutions are decisive assets for Northern Europe. In the Environment block, these countries also stand out in their low-carbon energy mixes and their strong ability to anticipate and manage both the transitional and physical risks arising from climate change.

Macro-ESG rating map of sovereign issuers



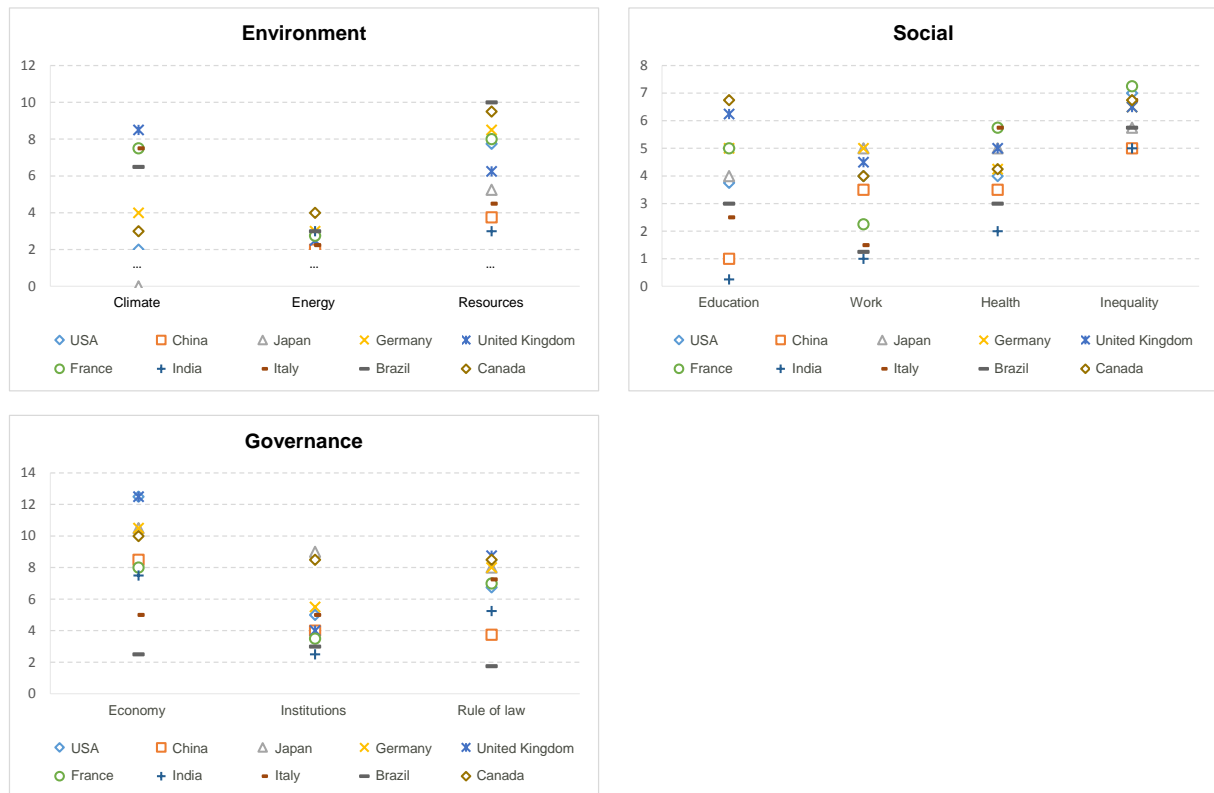
Source: ODDO BHF AM SAS, November 2019

Based on our assumption that a sustainable macro-development analysis gives us small positive or negative signals of the sustainability of a given development model, we have noted the following important divergences among the world's top 10 economies.

While exposure to climate risks and the management of energy and natural resources are major risks for the prosperity of Japan, the governance criteria suggest that Brazil will be mired in instability.

Germany and France, which alone account for more than 60% of wealth creation in the euro zone, boast rather similar sustainable macro-development profiles, although it is true that Germany gets low marks for its carbon intensity and growth model (Environment) and France for its relatively weak institutions and economic competitiveness (Governance).

Comparative review of the world's top 10 economies (3 pillars, 10 themes)



Source: ODDO BHF AM SAS, November 2019

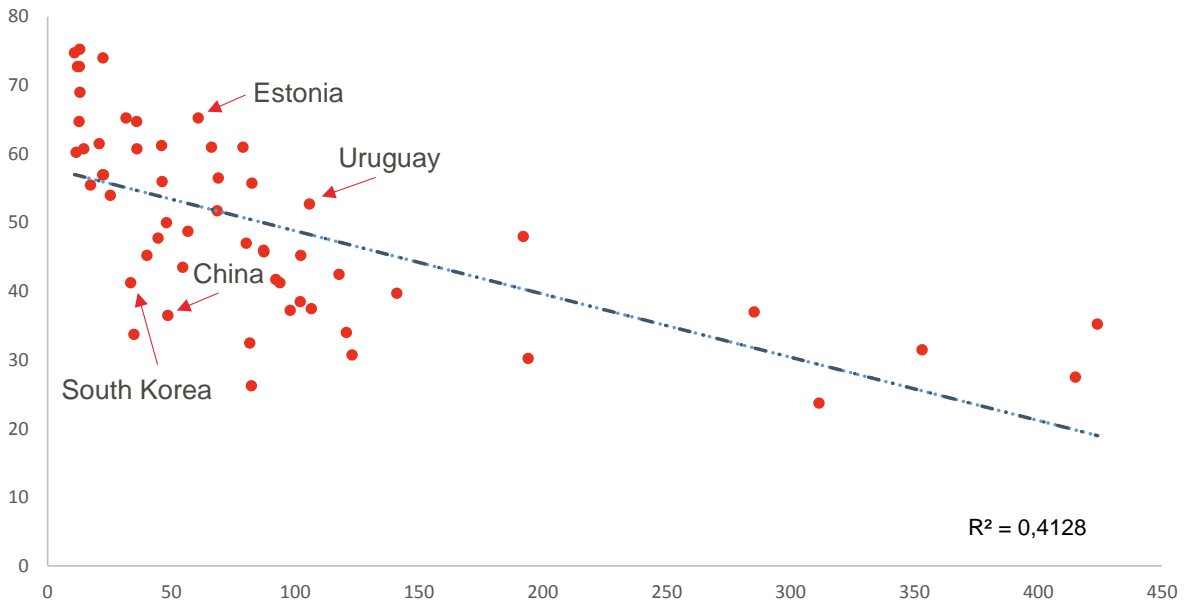
What signal is being sent out for the credit market?

A comparison of the ESG scores of the 65 countries under review with five-year CDS spreads revealed a significant reverse correlation of 65.4% (with a coefficient of determination of 0.41), meaning that the higher the ESG score, the narrower the spread.

On this basis, and assuming that the ESG analysis of sovereign issuers could help forecast a country's ability to honour its debt, these ESG results were also compared to the credit ratings of the three main agencies (S&P, Moody's and Fitch). While the findings are quite consistent in most cases, there are some interesting divergences on the potential of spreads to narrow or widen.



Correlation between five-year CDS spreads and macro ESG rating



Source: ODDO BHF AM SAS

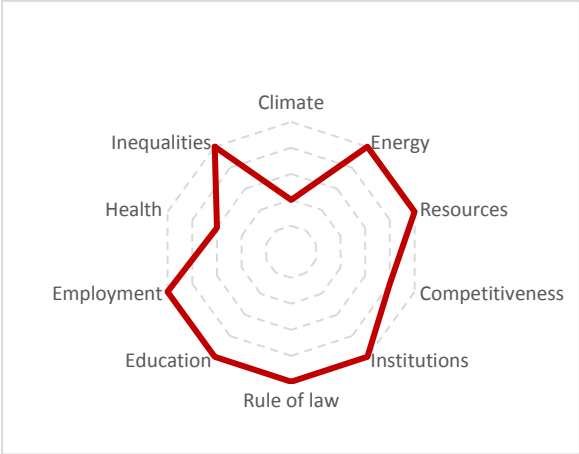
For example, the ESG scores for Estonia and Uruguay may point to a later improvement in their credit ratings. In contrast, the findings on South Korea and China point to structural weaknesses that their current credit ratings seem to brush over.

Examples of divergences between credit ratings and macro ESG rating

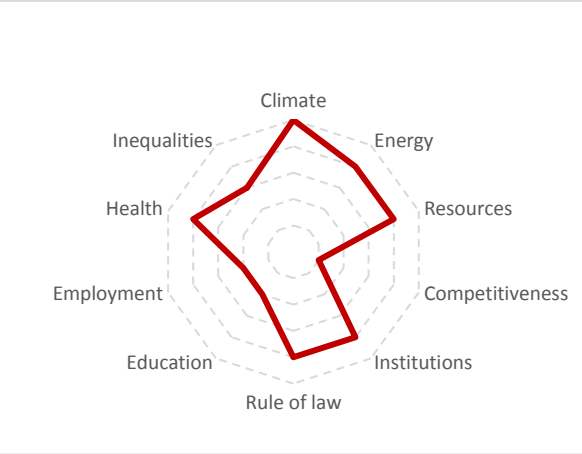
| | Credit rating | ESG rating |
|-------------|---------------|------------|
| Estonia | AA- | 5 |
| Uruguay | BBB | 4 |
| South Korea | AA | 2 |
| China | A+ | 2 |

Source: ODDO BHF AM SAS, November 2019

Estonia



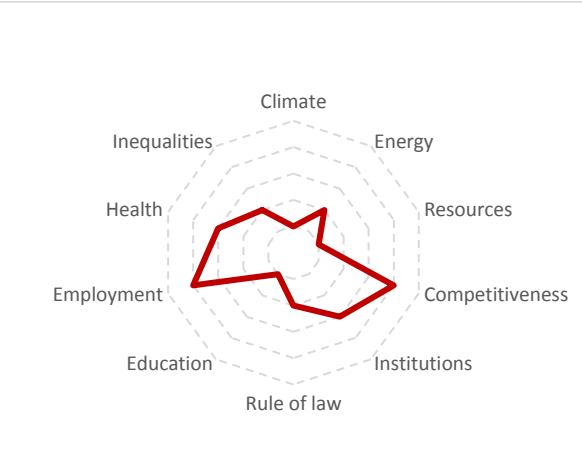
Uruguay



South Korea



China



Source: ODDO BHF AM SAS, November 2019



Conclusion

A country's solvency depends basically on its competitiveness and its ability to support its long-term economic growth. As we noted in the introduction, investors traditionally review a series of conventional macroeconomic variables, such as GDP, inflation and unemployment. However, the ability to sustain economic growth also depends on many social and environmental factors. Taking ESG factors into consideration should therefore help investors assess countries' solvency more comprehensively, especially in the current environment of low and even negative interest rates in certain regions, which is pushing the stock of global debt to record levels.

ODDO BHF Asset Management's plans to update its review of sovereign issuers annually, in order to better monitor potential weak signals of improvement or worsening in a countries' long-term credit profiles.

Annex 1: Macro ESG ratings of sovereign issuers

| Ranking | Country | ESG score | ESG ranking |
|---------|----------------|-----------|-------------|
| 1 | Sweden | 75.3 | 5 |
| 2 | Switzerland | 74.8 | 5 |
| 3 | New Zealand | 74.0 | 5 |
| 4 | Norway | 72.8 | 5 |
| 5 | Denmark | 72.8 | 5 |
| 6 | Luxembourg | 72.3 | 5 |
| 7 | Finland | 69.0 | 5 |
| 8 | Canada | 65.3 | 5 |
| 9 | Estonia | 65.3 | 5 |
| 10 | Austria | 64.8 | 5 |
| 11 | United Kingdom | 64.8 | 5 |
| 12 | Australia | 61.5 | 5 |
| 13 | Czech Republic | 61.3 | 5 |
| 14 | Lithuania | 61.0 | 4 |
| 15 | Iceland | 61.0 | 4 |
| 16 | Netherlands | 60.8 | 4 |
| 17 | Ireland | 60.8 | 4 |
| 18 | Germany | 60.3 | 4 |
| 19 | Belgium | 57.0 | 4 |
| 20 | France | 57.0 | 4 |
| 21 | Latvia | 56.5 | 4 |
| 22 | Slovakia | 56.0 | 4 |
| 23 | Slovenia | 55.8 | 4 |
| 24 | USA | 55.5 | 4 |
| 25 | Japan | 54.0 | 4 |
| 26 | Uruguay | 52.8 | 4 |
| 27 | Poland | 51.8 | 3 |
| 28 | Portugal | 50.0 | 3 |
| 29 | Israel | 48.8 | 3 |
| 30 | Italy | 48.0 | 3 |
| 31 | Spain | 47.8 | 3 |
| 32 | Hungary | 47.0 | 3 |
| 33 | Malta | 46.3 | 3 |
| 34 | Croatia | 46.0 | 3 |
| 35 | Bulgaria | 45.8 | 3 |
| 36 | Russia | 45.3 | 3 |
| 37 | Chile | 45.3 | 3 |
| 38 | Singapore | 44.8 | 3 |
| 39 | Malaysia | 43.5 | 3 |
| 40 | Vietnam | 42.5 | 2 |



| | | | |
|----|--------------|------|---|
| 41 | Romania | 41.8 | 2 |
| 42 | South Korea | 41.3 | 2 |
| 43 | Indonesia | 41.3 | 2 |
| 44 | Argentina | 41.0 | 2 |
| 45 | Brazil | 39.8 | 2 |
| 46 | Columbia | 38.5 | 2 |
| 47 | Cyprus | 37.5 | 2 |
| 48 | Serbia | 37.3 | 2 |
| 49 | Greece | 37.0 | 2 |
| 50 | Montenegro | 37.0 | 2 |
| 51 | China | 36.5 | 2 |
| 52 | Turkey | 35.3 | 2 |
| 53 | Albania | 34.0 | 1 |
| 54 | Mexiko | 34.0 | 1 |
| 55 | Thailand | 33.8 | 1 |
| 56 | India | 32.5 | 1 |
| 57 | Macedonia | 32.0 | 1 |
| 58 | Nigeria | 31.5 | 1 |
| 59 | Morocco | 30.8 | 1 |
| 60 | South Africa | 30.3 | 1 |
| 61 | Venezuela | 30.3 | 1 |
| 62 | Tunisia | 27.5 | 1 |
| 63 | Iran | 26.5 | 1 |
| 64 | Algeria | 26.3 | 1 |
| 65 | Egypt | 23.8 | 1 |

Source: ODDO BHF AM SAS, November 2019

Glossary

Brundtland Report:

The Brundtland Report is the name by which a publication officially entitled *Our Common Future*, is commonly known. It was produced in 1987 by the World Commission on Environment and Development (WCED), chaired by Gro Harlem Brundtland of Norway. As a foundation document for the 1992 Earth Summit, the Brundtland Report refers to and defines the concept of “sustainable development”.

United Nations Global Compact:

The United Nations Global Compact is an initiative to encourage the world’s companies to adopt sustainable and socially responsible policies. The United Nations Global Compact is a framework for companies with 10 principles in the areas of human rights, the environment and efforts to combat corruption. The initiative includes 13,000 participating companies and other stakeholders from more than 170 countries with two objectives: “to integrate these principles into their corporate strategies, culture and day-to-day operations” and “to take strategic actions to advance broader societal goals, such as the UN Development Goals (SDGs).

SDGs:

The Sustainable Development Goals are a set of 17 closely related global objectives set by the United Nations. The SDGs cover a broad range of development issues, such as poverty, hunger, healthcare, education, climate change, gender equality, water, public health, energy, and environmental and social justice. On 25 September 2015, the 193 member-countries of the UN General Assembly adopted the 2030 development programme entitled “Transforming our World: the 2030 Agenda for Sustainable Development”.

Credit spread:

Credit spreads express the risk premium, or spread, between corporate bond yields and yields on government bonds with the same characteristics.



About ODDO BHF Asset Management

ODDO BHF Asset Management is part of the independent Franco-German financial group ODDO BHF that was founded in 1849. ODDO BHF AM is an asset management leader in Europe. It comprises ODDO BHF AM GmbH in Germany, ODDO BHF AM SAS, ODDO BHF Private Equity SAS in France and ODDO BHF AM Lux in Luxembourg, which together manage assets totaling € 58.1 billion.

ODDO BHF AM offers its institutional and wholesale clients a unique range of high-performance investment solutions in all main asset classes, i.e. European equities, quantitative strategies, fixed income, multi-asset solutions, private equity and private debt.

A UN-PRI signatory since 2010 ODDO BHF AM has integrated sustainable investment criteria into a wide range of strategies. Its ESG approach focuses on ESG criteria integration, engagement with companies and a climate policy supporting the energy transformation.

On a combined basis, 60% of assets under management are from institutional clients and 40% from distribution partners. The teams operate from investment centers in Dusseldorf, Frankfurt, Paris and Luxembourg with additional locations in Milan, Geneva, Stockholm, Madrid, Hong Kong, Abu Dhabi and Zurich.

ODDO BHF AM puts the long-term support of its clients at the heart of its priorities. Its independence allows its teams to be responsive, flexible and innovative in order to constantly find solutions tailored to the customers' needs.

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