



Measuring Country Intangibles

ROBECOSAM'S COUNTRY SUSTAINABILITY RANKING

Overview

RobecoSAM's country sustainability framework evaluates 60 countries on a broad range of Environmental, Social and Governance factors that RobecoSAM considers to be key risk and return drivers relevant for investors.

It consists of 17 indicators, each of which is based on various data series, or sub-indicators, whereby each indicator is assigned a predefined weight out of the total framework. Based on the standardized scores countries receive for each of the indicators and their corresponding weights, a country sustainability score ranging from 1 to 10, with 10 being the highest, is calculated for each country. The resulting scores offer insights into the investment risks and opportunities associated with each country, and allow investors to better compare countries to each other.

Introduction

In an effort to continuously integrate sustainability considerations into a growing range of asset classes, Robeco and RobecoSAM have jointly developed a comprehensive and systematic framework for determining country sustainability rankings. This framework is designed to complement traditional sovereign risk assessments carried out by rating agencies and classic economic, financial and political country risk analysis. As such, it forms the basis for incorporating environmental, social and governance risk analysis into the construction process for Robeco and RobecoSAM's sovereign debt portfolios and indices.

Country sustainability analysis offers an alternative view into an economy's underlying change drivers and provides investors with insights into a country's strengths and weaknesses on a broad selection of environmental, social and governance indicators. It primarily focuses on mid-to long-term factors that have an indirect (or 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, but that are usually insufficiently considered in traditional sovereign rating assessments. Such factors therefore reveal potential opportunities and threats faced by countries beyond the ones typically covered by investors. Used in combination with traditional country risk analysis, the Country Sustainability Ranking can be a powerful tool to enhance investment decisions.

Over 25 years ago, the Brundtland Commission's report "Our Common Future" defined the now widely accepted concept of sustainable development as "development that

meets the needs of the present without compromising the ability of future generations to meet their own needs."1

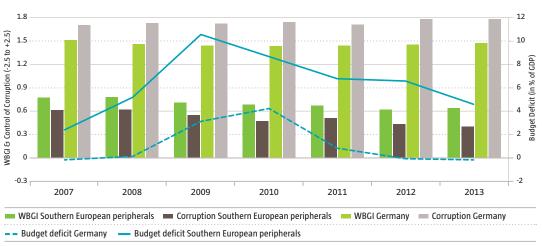
RobecoSAM's country sustainability analysis is based on this definition and recognizes that a country's ability to safeguard the needs of its future generations extends beyond the protection of the environment and encompasses a broader range of social, economic and governance objectives. In addition to evaluating a country's access to and management of its natural resources, RobecoSAM's research considers a number of social factors such as investments in education, and governance factors such as aging policies. Such factors are frequently overlooked by investors, but have a more or less direct impact on a country's economic performance and ultimately, its overall long-term investment profile.

These features are often embedded in the social and institutional structures of a country. When countries fail to adequately and proactively address the long term challenges they face in these areas, such challenges can eventually develop into pressing issues that require immediate attention in order to prevent a country's economic and political development from being derailed. The ESG (sustainability) analysis of a country focuses on the examination of these types of risk indicators and their long-term relationships. Various events during the last few years – from the Euro sovereign debt crisis to the Arab Spring and the Ukraine crisis – illustrate the relevance of this type of information for investors. Not only can shortcomings in a country's ESG profile result in sudden and disruptive incidents, they also often manifest themselves in a weaker macroeconomic performance.

Figure 1 shows that the Southern European peripheral countries (Greece, Italy, Portugal and Spain) with a weaker governance structure, as measured by the average World Bank Governance Indicators (also incorporated into our rating tool), performed much worse during the financial crisis than Germany did. So far, Germany's economy has proven to be far more resilient,

has enjoyed a much faster recovery, and has not faced the same pressure on its creditworthiness as the peripheral countries. Endemic corruption, especially in many emerging countries, is a particularly problematic issue, given its adverse impact on economic growth and business operations.

Figure 1: Governance structure matters for fiscal performance



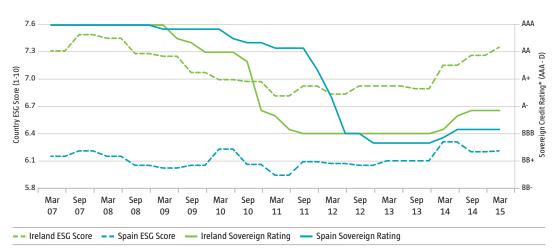
WBGI=World Bank Governance Indicators

Source: IMF, World Bank

Not only do governance and ESG features affect a country's economic development and therefore its creditworthiness, they also have proven to be useful leading indicators. Figure 2 shows that the country ESG rating for

Ireland began to deteriorate earlier than capital market ratings and that the pre-crisis ESG score for Spain (6.19 in March 2007) was well below that of Germany (7.34), even though Spain also enjoyed triple-AAA status at the time.

Figure 2: ESG assessment providing early warnings



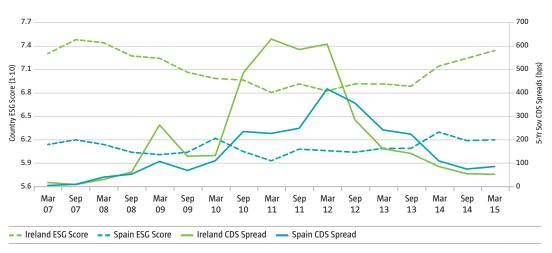
^{*} Average of three major rating agencies

Source: RobecoSAM, Robeco, Fitch, Moody's, S&P

Financial markets also underestimated or simply ignored several countries' overall risk profiles and only began to readjust their risk appetite in early 2010, after it had already become clear that the financial/banking crisis had morphed into a veritable sovereign debt crisis,

as revealed by the 5-year sovereign credit spread moves in Figure 3. Hence, a careful look at ESG criteria and developments already revealed early warning signs of adverse economic and financial developments in these countries.

Figure 3: Country ESG scores vs. sovereign CDS spreads

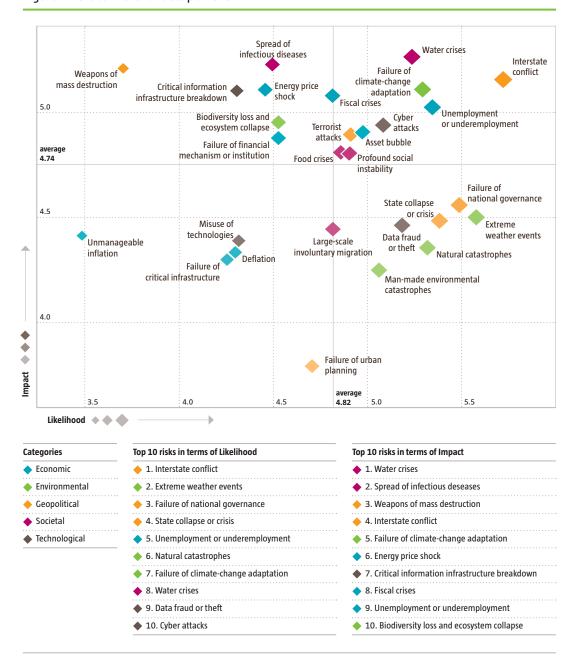


Source: RobecoSAM, Robeco, Bloomberg

A look at Figure 4, which maps the most likely and impactful global risks compiled by the World Economic Forum, reveals how environmental, social and geopolitical (which largely correspond to the indicators listed in the Governance dimension according to our own terminology) factors can pose a threat to today's global economy. According to the survey, five global risks stand out as both highly likely and as potentially having a high impact: interstate conflicts, water crises, failure to adapt to climate change, unemployment or underemployment, and cyber-attacks. Unfavorable developments in these areas can easily fuel social instability or violent social unrest with adverse consequences for a nation's

economy. But incidents such as energy price shocks, extreme weather events, natural catastrophes, national governance failures, or even a state collapse, can also have sudden and drastic negative implications for government finances, the economy as a whole and, last but not least, a country's overall creditworthiness profile, suggesting that such ESG aspects cannot be ignored. Indeed, all key sustainability features outlined on the WEF map are also taken into consideration in our country sustainability rating tool in one of the 17 main ESG indicators, or, in one of the factors within the much broader set of underlying sub-indicators.

Figure 4: Global risks landscape 2015



Survey respondents were asked to assess the likelihood and impact of the individual risks on a scale of 1 to 7, 1 representing a risk that is not likely to happen or have impact, and 7 a risk very likely to occur and with massive and devastating impacts.

Source: The Global Risks Report, World Economic Forum, Switzerland 2015

In addition, not only does a proper analysis of a country's ESG profile support the selection process for sovereign bonds, it can also provide valuable insights at a company (or sector) level. This is because an individual firm does not operate in a vacuum, but is always affected by its immediate business environment, which can be subject to sovereign interference to a greater or lesser extent, depending on the country. Hence, an awareness of countries' underlying structural flaws or strengths can help investors recognize potential investment risks or opportunities for companies, thus contributing to better

informed investment decisions on a broader range of asset classes.

Robeco first began to conduct internal research into country level sustainability as early as 2009. Leveraging Robeco's experience in managing government debt strategies and RobecoSAM's long-standing expertise in identifying and analyzing sustainability factors that are financially material to companies' performance, Robeco and RobecoSAM joined forces to develop a framework for evaluating the sustainability (ESG) profile of countries.

Research

The bulk of the research focuses on sourcing meaningful data that have an impact on a country's sustainability profile and ultimately, its creditworthiness. Considerable effort is devoted to identifying, categorizing and analyzing economic, environmental, governance and social data, and combining it into a single country ESG score.

Sources include international organizations such as the World Bank, the United Nations, or the International Labor Organization, as well as a variety of reputable government agencies, private institutions and NGOs. Factors selected for inclusion in the country sustainability analysis framework must meet the following criteria:

Plausibility & relevance

The choice of data series must provide a plausible explanation for having an impact on the medium-to long-term change in the risk profile of states.

Credibility & availability of data

Data should be verifiable and free of subjective assumptions that can raise questions about the quality of the data. Therefore, only data from trusted external, publicly available data sources are used. In addition, the data should be available within a reasonable time frame and frequency.

Clarity

Data and indicators used should be clear and understandable, including to non-specialist stakeholders, and should be reasonably easy to communicate and explain.

Adequate country coverage

Data must be available for a sufficiently broad range of countries, covering both developed and emerging countries. Emerging and developed countries are treated equally in the model, but for the investment process we also observe trends in ESG scores and make cross-country comparisons within peer groups (for instance, by income classification) in order to better identify countries with limited financial resources that are more efficient in terms of sustainability performance.

Limit data overlap

Although some data overlap cannot be fully avoided, data redundancies should be limited to the greatest extent possible to prevent unwanted duplication and overweighting of some factors.

RobecoSAM carefully checks all data against the criteria set out above before incorporating it into the country analysis tool.

Sustainability factors

As indicated earlier, the country sustainability framework considers criteria in the Environmental, Social and Governance dimensions, which consist of a series of indicators and sub-indicators.

Environmental dimension: Environmental challenges pose a potential risk for investors, as environmental externalities can result in significant economic losses, while repairing environmental damage such as air and water pollution can generate considerable fiscal costs. Adequate investments towards preventing environ-

"The far-reaching consequences of momentous events such as the Arab Spring or the 2008 financial crisis have led to a growing recognition that a comprehensive risk assessment of a country must also include an analysis of its ESG profile. All the more so, as the subsequent European sovereign debt crisis has made it clear that government bonds can no longer be considered 'risk-free' assets."



Max Schieler Senior Country Risk Specialist RobecoSAM

mental problems limit such potential liabilities. Another important risk is related to the country's exposure to natural hazards such as floods, hurricanes or typhoons.

In addition to evaluating a country's environmental vulnerabilities and policies, RobecoSAM also examines its energy dependency and energy policies. Countries that rely heavily on fossil fuel imports are vulnerable to abrupt and /or sharp external price movements or supply shortages. In addition to assessing the risks themselves, RobecoSAM specifically looks for evidence that policies for mitigating such risks have been put into place.

Social dimension: A weak social climate dominated by labor unrest, extreme inequality, or other social tensions is another potential investment risk. A delicate social climate can easily result in violent turmoil, disrupting important economic activity such as manufacturing or trade and/or paralyze policymaking. Strong social cohesion, on the other hand, supports orderly conflict resolution and facilitates the implementation of necessary reforms, thus contributing towards sustainable economic development.

Governance dimension: RobecoSAM looks at a broad range of data that takes into account a country's institutional framework, regulatory quality, rule of law, government efficiency, central bank independence and political stability, among other factors. Civil liberties, internal conflicts and corruption also reflect a country's governance profile. The corruption level, for instance, shows the extent to which public power is exercised to protect the interests of a small group at the expense of the economy and society at large. A recent study by Robeco demonstrates the added value of considering political risk when taking investment decisions for government bonds, over a time period of twenty five years.²

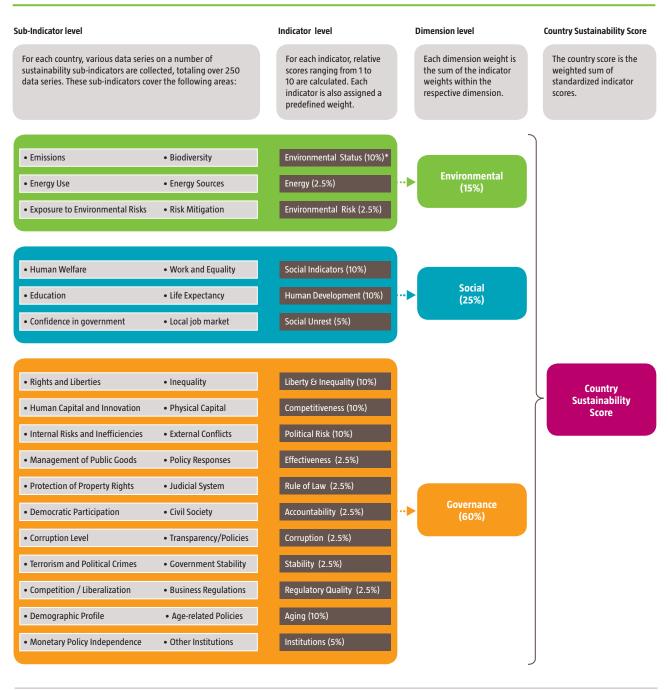
² http://www.robeco.com/ en/professionals/insights/ geopolitical-risk/profitingfrom-political-risk.jsp

http://papers.ssrn.com/ sol3/papers.cfm?abstract_ id=2471096

A structured approach

Figure 5 provides an overview of the overall structure of the Country Sustainability Ranking framework as well as the type of individual criteria selected for the analysis of a country's Environmental, Social and Governance profile.

Figure 5: Structure of the country sustainability framework



*Predefined indicator weight

Source: RobecoSAM, Robeco

Sub-indicator

Sub-indicators provide granular detail on a range of broad factors, or data points. For instance, within the energy indicator, RobecoSAM looks at the energy intensity required to produce a specific amount of GDP, the country's use of renewable energy sources and energy imports. Such detailed information enhances the country analysis.

Indicator

In order to make the broad range of distinct data comparable, data for each indicator is converted into a relative score on a scale from 1 to 10, with 10 being the highest. This is done through a normalization process based on z-scores, whereby scores are assigned to each indicator based on its average and standard deviation within the distribution of data points. The selection of indicators is reviewed periodically, based on new evidence and/or availability of data that meet the criteria described in the box on page 5.

Weighting

Each indicator is assigned a weight of 2.5%, 5% or 10%, reflecting RobecoSAM's view on its potential impact on a country's risk profile. The weighting scheme is reviewed periodically, based on the results of statistical analysis.

Indicator weights within each dimension add up to the total dimension weight.

Dimension

Indicators are grouped into one of the three dimensions: Environmental, Social or Governance. Each dimension weight is the sum of the indicator weights within the respective dimension. The dominant weight of the governance dimension reflects the importance we assign to a country's institutional framework as a key precondition for the efficient and effective use of its natural resources and human capital. Although the availability of natural resources provides a country with a competitive advantage, historical evidence also shows that countries endowed with abundant natural resources often exhibit worse economic performance than countries with fewer resources but better governance. This suggests that a country's governance structure has a stronger and more direct influence on its economic well-being than other ESG factors. As shown in Figure 6, advanced economies score significantly better than emerging markets on all Governance and Social indicators, except for aging. Within the Environmental dimension, developed markets show a stronger score only for the environmental status indicator, whereas all country groups score closely together in the area of energy.

Figure 6: Average country ESG scores by income group



Total Score = Country Sustainability Ranking

Each country is assigned a total score ranging from 1 to 10, with 10 being the highest. A country score can be viewed as a rating for an individual country, determining its rank among the universe of assessed countries. Country ESG (sustainability) data is treated on a rela-

tive basis ensuring methodological consistency with credit ratings, which are relative and not absolute risk measures, and are therefore also in effect rankings. For additional details on the score calculation, please refer to the box below.

Score Calculation

Step 1: Calculate z-scores for each indicator using the distribution of indicators over countries. The resulting z-scores range between -3 and +3.

Step 2: Calculate the weighted average z-score per dimension (E, S and G). For missing indicator data, that indicator's weight is redistributed among the other indicators within the same dimension.

Step 3: Calculate a new z-score for the weighted average z-scores for each of the three dimensions

This statistical step is necessary because the distribution of weighted average z-scores (Step 2) is no longer a z-score in terms of the distribution of the outcomes. Without this step, the weights would no longer be properly reflected in the overall score. The consequence, however, is that the individual z-scores do not add up to the total.

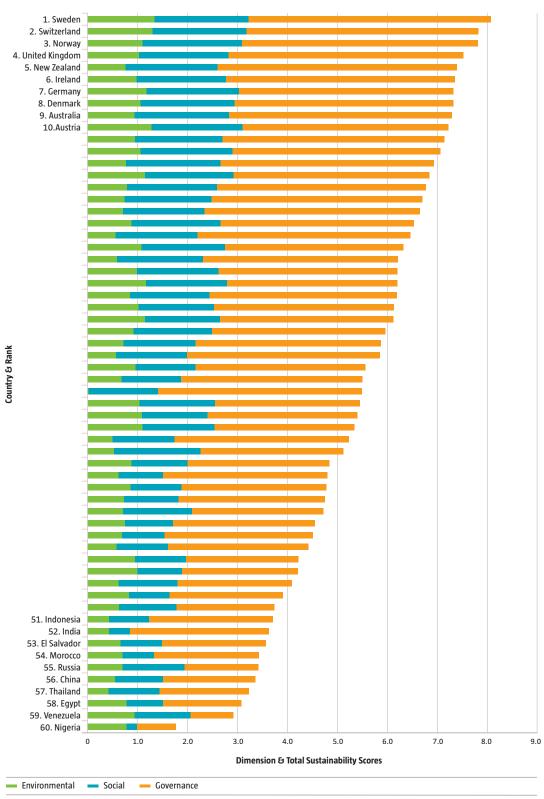
Step 4: Take the weighted sum of the recalculated z-scores for each dimension.

Step 5: Calculate again a z-score of these sums. This is for the same statistical reason as described in step 3.

Step 6: The z-scores range from -3 to +3. In order to convert a z-score into a sustainability score ranging from 1-10, the following equation is applied:

Country sustainability score = 1 + ((z-score + 3)*1.5)

Figure 7: Country Sustainability Ranking: top 10 and bottom 10 countries



Source: RobecoSAM, Robeco, Data as of April 10, 2015

A Country pair comparison: Sweden and Russia

Governance Institutions Aging Corruption Rule of Law **Regulatory Quality** Effectiveness Stability Accountability Political Risk Competitiveness Liberty & Inequality Social Social Unrest **Human Development Social Indicators** Environmental Energy **Environmental Risk Environmental Status** 1.0 2.0 3.0 4.0 7.0 6.0 **Indicator Scores** Sweden Russia

Figure 8: ESG indicator scores for Sweden & Russia

Source: RobecoSAM, Robeco, Data as of April 10, 2015

Based on the RobecoSAM framework, Sweden earns high scores across almost all criteria. Contrary to many developed economies, Sweden also scored well on Environmental factors, particularly on its environmental status and environmental risk indicators. On the Social dimension, the country performed well on factors such as labor participation, education and income inequality. Sweden's robust institutional framework is reflected in the Governance dimension, where it earns above-average scores for various factors.

Russia, in contrast, scores poorly on a number of Governance indicators. Noteworthy examples include political risk, civil liberties, accountability, rule of law, regulatory quality, corruption, and aging, which are also reflected in the country's difficult business environment. Shortcomings in the country's governance structure are partly responsible for the lack of peaceful conflict resolution policies, thus also creating a breeding ground for the simmering conflict with the Ukraine. Russia's scores on social indicators and human development look slightly better, but are lower than those of top-ranked Sweden and could deteriorate further in the context of a worsening economic situation. On the Environmental dimension, Russia receives low scores on criteria such as CO₂ emissions, waste management and the implementation of environmental policy. Overall, the key challenges for the Russia are the improvement of its internal governance structures and the need to implement aging-related policies.

Testing and refining the framework

Credit Default Swaps (CDS) can provide fixed income investors with protection against a company's or country's default on its debt. In essence, CDS spreads serve as an insurance premium: the riskier the investment, the higher its spread.

When comparing sovereign CDS spreads against RobecoSAM's country sustainability scores in a regression analysis, a negative correlation is expected: a higher country sustainability score represents lower sustainability risk and would therefore imply a lower insurance premium. Until the emergence of the sovereign debt problems in the wake of the financial crisis, sovereign CDS spreads for most developed countries were relatively stable and low. This changed in 2010, however, and since then the spreads have remained rather volatile and elevated, in particular for the Southern European peripheral countries.

To test the aforementioned assumption, RobecoSAM carried out a regression analysis on all countries that were assessed by RobecoSAM and for which CDS data was available (with a few exclusions due to either missing and /or distorted) data to determine the relationship between their country sustainability scores (independent variable x) and changes in sovereign credit default swaps (dependent variable y):

CDS spread =

constant + β * country sustainability score + ϵ

A statistically negative β would be expected if financial markets were to price in the country sustainability risk. In other words, a higher sustainability score would imply a lower CDS spread. Figures 9 and 10 show the results of the regression analysis.

8.5

8.0

7.5

7.0

6.5

5.5

4.0

3.5

3.0

2.5

0 50 100 150 200 250 300 350 400 450

5-year Sovereign CDS Spread (bps)

Figure 9: Country ESG scores vs. 5-Year Sovereign CDS spreads

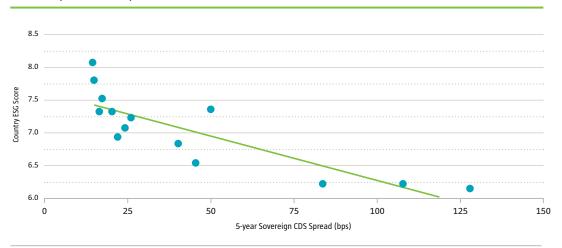
Source: RobecoSAM, Robeco, Bloomberg, Data as of March 31 & April 10, 2015

The negative relationship between a country's sustainability scores and the CDS spreads is evident in the scatter diagram in Figure 9, indicating that a stronger sustainability profile (score) corresponds to a lower insurance premium, as measured by the CDS spreads, suggesting that a country's sustainability profile plays an important role in the

price of sovereign credit risk. Thus it is useful for investors to gather information on countries' sustainability profiles and summarize them in a total sustainability ranking.

Figure 10 shows the results of the regression analysis for the more limited sample of EU industrialized countries.

Figure 10: Country ESG scores vs. 5-Year Sovereign CDS spreads (for European developed markets)



Source: RobecoSAM, Robeco, Bloomberg, Data as of March 31 & April 10, 2015

"Our Country Sustainability Ranking tool complements traditional fixed income analysis. We look at the story behind the country's sustainability score. Our statistical analysis helps us identify which sustainability criteria are financially more relevant, which in turn helps us make better-informed investment decisions."



Johan Duyvesteyn Senior Researcher at Robeco Quantitative Strategies

The relationship between a country's sustainability score and the corresponding sovereign CDS spread appears to be even stronger for this smaller universe of countries. This reflects the fact that sovereign debt woes were more accentuated in countries with obvious weaknesses in their governance structures.

In addition to examining the relationship between the sustainability scores and CDS spreads, an analysis of the relationship between the Environmental, Social and Governance dimensions was carried out. This more detailed examination reveals a strong positive correlation between the Social and Governance score, suggesting that a stable social climate facilitates the governance of a country. Another observation is that the relationship between Social and Governance factors and CDS spreads is stronger than it is between Environmental factors and CDS spreads. An explanation for this could be that the benefits of investments towards protecting the environment are typically not felt until the distant future, and some of the environmental damage, such as pollution, is often transferred to other countries. This observation supports the decision to assign a larger weight to Governance and Social indicators in the Country Sustainability Ranking framework.

Case Study: Ireland vs. Greece

Recently, the Country Sustainability Ranking has helped Robeco's Fixed Income team to better differentiate between euro area periphery countries. Within the periphery countries, Ireland stands out as a prime example of a country for which the ESG profile has markedly improved. Areas in which progress has taken place include, among others: the quality of bureaucracy, transparency of policymaking, public support for the government and CO₂ emissions. All of this has helped Ireland to become the fastest-growing EU economy with its GDP expected to expand by 3.5% in 2015, making it

"A closer look at the two countries' sustainability profiles and their development over the past year helped us to better identify underlying governance risks, thus enabling us to take bold, better-informed investment decisions with regard to Irish and Greek government bonds."



Rikkert ScholtenSenior Portfolio Manager
Robeco Fixed Income Department

a successful example of how diligent reforms can put a country back on track. As a result of this improvement, Ireland's ESG score is almost back to its pre-crisis levels and even matches that of Germany, as shown in Figure 7. More importantly, this finding helped the Robeco Fixed Income team to better evaluate the risks of investing in Irish government bonds and partly drove its decision to increase investments in this market in spite of other risks such as lower liquidity in a relatively small market.

Greece is an example of a country whose ESG score prevented the Robeco Fixed Income team from investing in the country. The Greek bond market performed well during the first few months of 2014, and a bond issuance in April and July was heavily oversubscribed. However, the Robeco Fixed Income team did not take part in these auctions. One reason for this was Greece's lack of improvement in its ESG profile during the past year, after some progress was observed in late 2013 and early 2014. Despite its reform plans, the country has continued to score poorly on factors such as social unrest, effectiveness of government policy. corruption, quality of institutions and environmental risks. Social unrest and political uncertainty ahead of the elections also hampered fiscal consolidation. Visits to the country and meetings with policymakers confirmed this lack of progress. Therefore, the outlook for Greece remains uncertain, with looming large downside risks such as its strained relationship with the troika and its European partners, a widening funding gap, simmering social tensions, another early election, the implementation of capital controls, or even a possible 'grexit' from the Eurozone.



Source: RobecoSAM, Robeco, Data as of April 10, 2015

One ranking, a world of applications

The insights derived from the Country Sustainability Ranking are fully integrated into the analysis and investment process for Robeco's sovereign debt strategies. Changes to a country's ESG score and its overall ranking indicate whether a country's risk profile is improving or deteriorating. Our fixed income team uses the ESG scores and changes to country scores to identify trends in, for instance, the political climate. By investing in countries that show an improvement rather than avoiding them, investors support the reform process and can profit from investing in countries that are making progress. Thus the Country Sustainability Ranking is a useful instrument in our toolkit when determining the country allocations in our government bond portfolios.

In addition, the RobecoSAM Country Sustainability
Ranking forms the research backbone for the construction of the S&P ESG Sovereign Bond Index
Family, offered jointly by S&P Dow Jones Indices and
RobecoSAM. These indices offer investors exposure to
the same sovereign bonds as standard cap-weighted
sovereign bond indices, but tilt the country weights
towards the more sustainable countries, and underweight the less sustainable countries, based on the
countries' total sustainability scores derived from the
RobecoSAM Country Sustainability Ranking framework.

Conclusions

Investors' demand for long-term oriented strategies that integrate environmental, social and governance considerations across a range of different asset classes is growing steadily. This is largely a result of the financial crisis and the ensuing sovereign debt problem in several developed economies, which exposed some of the shortcomings of traditional measures used to assess

country and sovereign risk. RobecoSAM will continuously refine its country sustainability methodology to capture relevant new information. This will ensure that the ranking serves as a valuable tool that provides additional information to complement the traditional analysis of countries' creditworthiness, thus helping to improve the risk and return profile of our investment decisions.

About RobecoSAM

Founded in 1995, RobecoSAM is an investment specialist focused exclusively on Sustainability Investing. It offers asset management, indices, engagement, voting, impact analysis, sustainability assessments, and benchmarking services. Asset management capabilities cater to institutional asset owners and financial intermediaries and cover a range of ESG-integrated investments (in public and private equity), featuring a strong track record in resource efficiency theme strategies. Together with S&P Dow Jones Indices, RobecoSAM publishes the globally recognized Dow Jones Sustainability Indices (DJSI). Based on its Corporate Sustainability Assessment, an annual ESG analysis of 2,900 listed companies, RobecoSAM has compiled one of the world's most comprehensive databases of financially material sustainability information.

RobecoSAM is a member of the global pure-play asset manager Robeco, which was established in 1929 and is the center of expertise for asset management within the ORIX Corporation. As a reflection of its own commitment to advocating sustainable investment practices, RobecoSAM is a signatory of the UNPRI and a member of Eurosif, ASrIA and Ceres. Approximately 130 professionals work for RobecoSAM, which is headquartered in Zurich. As of June 30, 2014, RobecoSAM had assets under management, advice and/or license in listed and private equity* of approximately USD 10.7 billion. Additionally, RobecoSAM's Governance & Active Ownership team** had USD 85.1 billion of assets under engagement and USD 53 billion of assets under voting.

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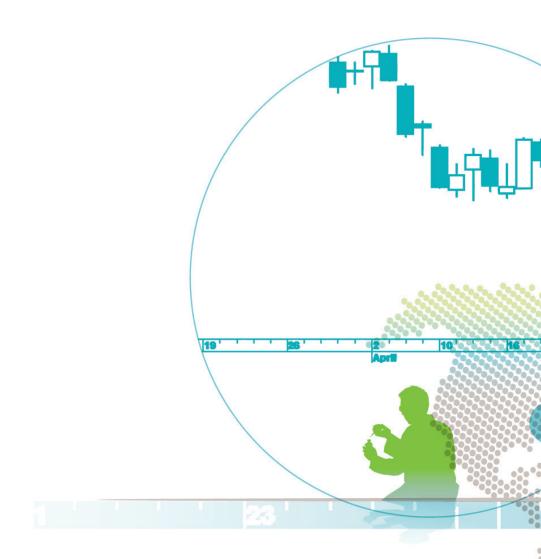
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