Mapping the global ESG landscape: A new comprehensive study

Special guest: An interview with Dr. Andreas Hoepner

Providing flexible solutions: The Deutsche Asset Management ESG Engine

A guide to benchmark sustainable equity indexes

Climate risk, financial stability and the transformation of China

Sustainable finance events in the year ahead

A historical timeline for major sustainable finance events
Dear reader,

Last year was witness to major landmarks in the area of sustainability and environmental, social and governance (ESG) activities. These included the UN General Assembly Sustainable Development Goals 2030 and the UN COP21 Climate Summit in Paris, both of which will require significant private sector finance for their implementation. As the first commercial bank accredited by the United Nation’s Green Climate Fund, Deutsche Bank is in an unrivalled position to lead the way in private sector climate finance.

We are therefore working with our clients and shareholders with the help of national governments and regulators in seeking opportunities that deliver financial returns as well as positive environmental and social outcomes. We are already seeing significant growth in ESG managed assets, which have outstripped overall market growth for the past two years, and this is being accompanied by fossil fuel divestments across a broad spectrum of the investor universe alongside the development of green finance. We believe this process will only gather in momentum.

Indeed as part of its G20 Presidency, China has established a green finance study group to mobilize the financial sector to support green investment, green bonds and green funds. The year 2016 will also see further steps in the area of financial inclusion. According to the World Bank, an estimated 2.5 billion working age adults – that is over half of the total adult population – have no access to financial services.

These trends are why Deutsche Asset Management has set a strategic goal to expand our sustainable, ESG and impact investment fund business. To support this goal we have created a new Center for Sustainable Finance, to collaborate with stakeholders to develop market solutions to social and environmental challenges, support the development of investment product offerings and produce thematic research.

I am therefore delighted to introduce to you the inaugural issue of the Sustainable Finance Report. In what will be a regular report, our center team will present what they view as the most critical issues of the day as they relate to the investment implications of sustainability and ESG macro-related trends and developments.

Quentin Price
Head of Deutsche Asset Management
Member of the Deutsche Bank Management Board
TABLE OF CONTENTS

Executive summary February 2016 ................................................................. 6
Mapping the global ESG landscape:
A new comprehensive study ........................................................................ 8
Special guest:
An interview with Dr. Andreas Hoepner .................................................... 16
Providing flexible solutions:
the Deutsche Asset Management ESG Engine ....................................... 20
A guide to benchmark sustainable equity indexes .................................. 28
Climate risk, financial stability and the transformation of China .......... 38
Sustainable finance events in the year ahead ........................................... 42
A historical timeline for major sustainable finance events ................. 43
Glossary ........................................................................................................ 44
The integration of environmental, social and governance (ESG) considerations into mainstream business practices and long-term value creation strategies is a defining topic for forward-looking clients. To embed further the principles of sustainability into Deutsche Asset Management’s own business DNA, we have launched the Deutsche Asset Management Center for Sustainable Finance.

The objectives for this new business unit are clear and ambitious: to be a thought leader and catalyst for sustainable finance by delivering state-of-the-art research and collaborating with key stakeholders to develop market solutions to social and environmental challenges.

Since the 1990s, Deutsche Asset Management has been actively managing assets in sustainable investments. In February 2008, we became a signatory to the UN’s Principles for Responsible Investment. Currently, we are managing assets across a wide range of sustainable products that encompass active and passive ESG screening strategies, sustainable investment funds, green real estate assets and social finance innovations. Moreover, pioneering impact investment products also confirm our commitment to defining new approaches to advance social and environmental benefits for at-risk communities throughout the world. Last year, Deutsche Bank was accredited by the United Nation’s Green Climate Fund, which will support developing countries to limit or reduce greenhouse gas emissions and to adapt to the impact of climate change.

As part of the Deutsche Asset Management Center for Sustainable Finance’s product offering, we are publishing today the Sustainable Finance Report. In this inaugural issue, we showcase a new study conducted by Deutsche Asset Management together with the University of Hamburg in what we believe is the most extensive review of academic literature as it relates to ESG and corporate financial performance (CFP) ever undertaken. Their analysis delivers some powerful conclusions in terms of the positive links between ESG and CFP most notably in North America and emerging markets as well as in fixed income and real estate markets.

In our second featured article, we are pleased to invite back to Deutsche Asset Management Dr. Andreas Hoepner, Associate Professor of Finance at the Henley Business School. Andreas provides his insights as to how the investment world has changed since his last white paper with Deutsche Asset Management was published in 2013. He then explores how the sustainable investment landscape will evolve over the coming years.

Next, we introduce more formally Deutsche Asset Management’s proprietary ESG Engine. The Deutsche Asset Management ESG Engine brings together what we view as being the most important key performance indicators from external data providers, non-governmental organizations and internal processes. These assess ESG compliance as defined by international guidelines and standards as well as through bespoke client requirements.

We then provide details of the sustainable index universe with particular focus on the range of indexes from the key benchmark providers of MSCI, FTSE and the S&P Dow Jones. We conclude by examining the links between climate change and financial stability and how China is addressing these issues.

We hope you find this report instructive and we look forward to engaging with you on these provocative topics.
In a new extensive study, Deutsche Asset Management and the University of Hamburg investigate whether integrating ESG into the investment process has had a positive effect on corporate financial performance (CFP), whether the effect was stable over time, how a link between ESG and CFP differs across regions and asset classes, and whether any specific subcategory of E, S or G had a dominant influence on CFP. We would like to express our gratitude to Fiona Reynolds, managing director, Principles of Responsible Investment (PRI) for providing the Foreword to this study, which can be found here.

Executive summary

How environmental, social and governance (ESG) criteria affect corporate financial performance (CFP) has been an area of academic and practitioner interest since the early 1970s. However, one of the main difficulties has been to establish a clear picture of the correlation between ESG and CFP. Indeed confidence has been undermined by some studies concluding that incorporating ESG in the investment process has delivered ambiguous, inconclusive or contradictory results.

If the number of empirical studies is a reliable guide, then investor interest in ESG has surged over the past 40 years. Since the early 1970s, around 2,250 academic studies have been published on the link between ESG and CFP, 70% of which have been published during the last 15 years. This surge in academic literature also tallies with the growth in assets under management dedicated to ESG investments.

In this white paper, we draw out the main conclusions from a joint Deutsche Asset Management and University of Hamburg study. This study examines the entire universe of ESG-CFP academic review studies that have been published since 1970. The analysis is based on the aggregation of the findings and the data of 60 review studies. To the best of our knowledge, this therefore represents the most extensive review of academic literature as it relates to ESG and CFP ever undertaken.

This new study also continues previous work undertaken by Deutsche Asset Management in June 2012 in the report Sustainable Investing: Establishing Long Term Value and Performance, which concluded that companies with high ratings for ESG and CSR have a lower cost of capital in terms of debt and equity. The results show that only 10% of the studies display a negative ESG-CFP relationship with an overwhelming share of positive results, of which 47.9% in vote count studies and 62.6% in meta-studies yield positive findings.

From an asset class perspective, studies have typically been focused on equity and equity-linked mutual funds and indexes. However, two important findings stand out; namely the disproportionate positive correlation between ESG and CFP as it relates to non-equity classes such as bonds and real estate and the weak correlation between ESG and CFP for mutual funds and indexes.

From a regional perspective, studies show that ESG is particularly effective in North America and emerging markets. In terms of the individual E, S and G subcategories, there did not appear to be a dominating single factor, but rather combinations seemed to reduce the rate of positive results between ESG and CFP.

This would seem to suggest that non-focused approaches led to a less compelling argument to deploy ESG. This might suggest that mixing various approaches together washes out the potential of outperformance. However, among the individual categories, governance exhibited the highest number of positive responses.

In terms of the correlation between ESG and CFP over time, the academic studies show that this has remained relatively constant since the mid-1990s. This suggests that the increasing number of signatories to the Carbon Disclosure Project (CDP) or the UN-supported Principles for Responsible Investment and the growing ESG awareness in the investment process has not led to decreasing ESG alpha. The authors of the underlying academic paper, Friede, Busch and Bassen believe the business case for ESG investing is empirically well founded, such that investing in ESG pays off financially and appears stable over time.

A shift in the investment landscape

The traditional approach to investment management has been to focus entirely on maximizing financial returns with no or limited focus on extra-financial factors of the underlying investments. However, for some time now investors have become increasingly aware of the materiality of sustainability issues such as climate change, resource scarcity, labor rights, corporate governance and their implications for broader economic and financial stability. This has triggered a new paradigm in the investment landscape to emerge whereby extra-financial factors are moving more into play.

\[^{1}\text{CFP measures are defined as accounting-based performance, market-based performance, operational performance, perceptual performance, growth metrics, risk measures and the performance of ESG portfolios. Portfolio studies comprise of studies on long-only ESG portfolios and in particular studies on ESG mutual funds and indexes.}\]
The investment spectrum

The first step from traditional investing we classify as responsible investing, which integrates ESG risk management techniques. This ranges from the exclusion, or negative screening, of harmful products such as cluster munitions and land mines, which in most jurisdictions forms part of mandatory regulation, to a wider integration of ESG criteria, such as food security, human rights and investor engagement. For other examples of key ESG criteria see Figure 2.

One example of how resource scarcity, for example, can have a material effect on economic and financial stability in the broader link between food prices and civil unrest. In a 2011 IMF study the link between food price inflation and anti-government demonstrations was assessed across 120 countries between 1970 and 2007. It found that a 10% increase in food prices led to a doubling in anti-government protests in low income countries where food constitutes a high share of total personal expenditures. To a large degree, these events and disasters have a material effect on economic and financial stability. For other examples of key ESG criteria see Figure 2.

The next stage in the investment process moves the investor from responsible towards sustainable investment opportunities, which focus towards positive environmental and social outcomes. As investors become more experienced in the sustainable investment space they then start to move towards thematic higher-impact investing. Typically this focuses on one or more issues where social or environmental needs create a commercial growth opportunity with market-rate or market-beating returns. A good example of this thematic approach is clean tech funds in China, which focus on industries and technologies that address air, water and soil pollution. The investment process moves to impact investing. Like thematic investing, this too concentrates investment to one or more issues where social or environmental needs create a commercial growth opportunity with market-rate or market-beating returns. At the end of the investment spectrum is philanthropy, which addresses social and environmental need, but requires a 100% financial trade-off.

The effect of ESG factors on CFP

As to the effectiveness of these types of investment strategies, there has been significant academic and practitioner interest in the link between incorporating Environmental, Social and Governance (ESG) criteria and corporate financial performance (CFP). In Friede, Busch and Bassen, estimates, between 1970 and 2015 there have been a total of 60 review studies with a gross number of 3,718 underlying studies on this topic. However, adjusted for overlaps this figure drops to around 2,250 unique studies, with the majority of this growth occurring from the mid-1980s, Figure 4. This surge in academic literature tallies with the growth in sustainable investment assets under management over this period, Figure 5.

It is this universe of around 2,250 studies that Deutsche Asset Management and the University of Hamburg have investigated to assess whether integrating ESG into the investment process has had a positive effect on CFP, whether the effect was stable over time, how the link between ESG and CFP differed across regions and asset classes, and to see whether any specific sub-category of E, S or G had a dominant influence on CFP. To the best of our knowledge, this therefore represents the most extensive review of academic literature as it relates to ESG and CFP ever undertaken. Friede, Busch and Bassen find that the business case for ESG investing is empirically well founded, such that investing in ESG pays financially and appears stable over time.

Figure 5: AuM linked to some form of ESG criteria investing in the U.S.

Source: U.S. SIF Foundation (July 2016)

Table: Share of positive findings

<table>
<thead>
<tr>
<th>Year</th>
<th>Share of positive findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>0.5%</td>
</tr>
<tr>
<td>2005</td>
<td>8.6%</td>
</tr>
<tr>
<td>2010</td>
<td>8.2%</td>
</tr>
<tr>
<td>2015</td>
<td>9.0%</td>
</tr>
</tbody>
</table>

Note: Vote-count studies and Meta-studies

Source: Friede, Busch and Bassen (December 2015)

Figure 6: Summary results

Source: Friede, Busch and Bassen (December 2015)
In terms of the high share of positive findings for bonds and real estate, this still represents a relatively young research field for ESG, such that between the end of the 1990s and 2014 there were 36 analyzed bond studies and seven real estate studies that were identified.

**Figure 7: Tracking the link between ESG and CFP across major asset classes (vote-count sample)**

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equities</td>
<td>62.2%</td>
<td>37.8%</td>
</tr>
<tr>
<td>Bonds</td>
<td>40.4%</td>
<td>59.6%</td>
</tr>
<tr>
<td>Real estate</td>
<td>52.2%</td>
<td>47.8%</td>
</tr>
</tbody>
</table>

Source: Friede, Busch and Bassen (December 2015)

However, one would be badly advised to transfer the findings in a few dozen mutual fund studies to the total sample of more than 2,100 other studies. Moreover, sophisticated investors are more likely to harvest the existing ESG alpha than the average investor (Grossman and Shilegitz 1998, Hoepner 2013, Nagy et al. 2015). At worst, investors in ESG mutual funds could also expect to lose nothing compared to conventional fund investments (Hamilton et al. 1993, Humphrey and Tan 2014, Reveli and Viviani 2015). In terms of the high share of positive findings for bonds and real estate, this still represents a relatively young research field for ESG, such that between the end of the 1990s and 2014 there were 36 analyzed bond studies and seven real estate studies that were identified.

**Figure 8: Environmental, social and governance categories and their relationship to CFP**

In terms of the key findings, one of the most compelling is the disproportionate positive response to integrating ESG criteria in non-equity classes and specifically fixed income and real estate.

**ESG and the portfolio study performance**

The disappointing results of portfolio studies (consisting of studies on mutual funds, indexes and long-short portfolios) are the potential cradle for the perception bias of investors about ESG investing. Portfolio-based studies in comparison to non-portfolio-based studies (firm-based) exhibit a weaker relation. This may reflect the fact that many ESG funds follow a mixture of negative and positive ESG screens, which attract a broad array of value-driven and profit-seeking investors. As a result, unifying this fund group under one classification may lead to distortions and drown out various overlapping market and non-market factors. Moreover, the authors find that part of the ESG alpha is wiped out as a result of fees, which on average account for 2.5% in the average mutual fund(s).

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**E, S or G impacts**

Another area of interest relates to which of the three ESG letters has a dominating influence on CFP. For our sample of vote-count studies with identifiable ESG categories in 644 studies, we find relatively similar positive results for E, S and G. However, the highest proportion of positive results occurs in G with 62.3% of all studies delivering a positive correlation. Figure 8. Although not conclusive from across the review studies and not examined in this study, the importance of governance and specifically investor engagement has been illustrated via the so-called CalPERS effect. As part of its due diligence, CalPERS, or the California Public Employees Retirement System, identifies companies for investor engagement that they view as having financial return and ESG issues. It reveals that active engagement has led to an improvement in stock market returns relative to the sector benchmark.

In a recent Hermes Investment Management survey of over 100 institutional investors into responsible capitalism, 90% of those surveyed believed fund managers should price in corporate governance risks as a core part of their investment analysis, alongside financial metrics. This reveals the increasing awareness of extra-financial considerations. However, governance-related aspects also exhibited the highest percentage of negative correlations at 9.2%. If the share of positive findings is subtracted from the positives, environmental studies offer the most favorable result, with social focused studies coming last. Interestingly, the findings from the 2014 U.S. SIF report revealed that for money managers focused solely to social criteria was the largest segment when measured by AuM, Figure 9.

Finally, when examining the review studies that focused on various combinations of ESG only 35.3% of the studies reported positive readings. This seems to suggest that non-focused approaches seem to lead to a less compelling argument to deploy ESG. This might reflect that mixing various approaches together washes out the potential of outperformance. It may also reflect the fact that individual studies covering E, S and G independently are more focused and so more relevant.

**Regional variations**

Some studies have also analyzed the potential differences in the ESG-CPF correlation across different regions. We detected two main patterns based on 402 studies with a closed regional identifier. First, developed markets excluding North America exhibit a smaller share of positive returns, with developed Europe exhibiting the worst results (23.1% positive results) compared to 42.7% for North America. Part of the poor results in Europe reflect the fact that a larger number of portfolio studies have been conducted with the European and Asian/Australian sample that potentially biases the data. However, when omitting all portfolio studies for the development market samples, the positive ratio for North America increases to 51.5%, and for Europe and Asia/Australia combined to 45.6%. This implies that the previous gap between the two samples shrinks considerably, from 14.9 to 5.9 percentage points, but is nonetheless sizeable.

**Figure 9: Percentage of AuM allocated to ESG buckets in the U.S.**

- Equity
- Bonds
- Real estate
- Positive
- Negative
- Environmental
- Social
- Governance

*Investment vehicles that incorporated criteria related to products of concerns such as alcohol and tobacco. Source: U.S. SIF Foundation (July 2014)
ESG over time

Another area of investigation in our study was whether the ESG-CFP relationship is stable over time. Theoretically, the growing number of PRI signatories and the presumption that investment strategies are becoming increasingly aware of ESG might imply a decreasing ESG alpha that is captured by a diminishing correlation between ESG and CFP over time. This could be in response to the apparent existence of learning effects in capital markets. However, in our sample of 551 primary studies with disclosed correlation factors we found no indications of a learning curve. In fact we consistently found that across all time stamps, but especially since the mid-1990s where there has been a period of greater ESG participation and investigation, correlations were stable over time.

Conclusion

The materiality of sustainability is undisputed. However, the challenge is to integrate environmental, social and governance criteria into the investment process to harvest the full potential of value-enhancing ESG factors. Despite challenges, we find that this is becoming an increasing area of interest for the investor community. In this article, we have presented what we believe is the largest review of academic literature as it relates to ESG and CFP ever undertaken. It reveals that ESG opportunities exist in many areas of the market. In particular this holds true for North America and emerging markets and also in non-equity classes such as bonds and real estate. The orientation toward long-term responsible investing should therefore be important for all kinds of rational investors in order to fulfill their fiduciary duties and better align investors’ interests with the broader objectives of society.

The full academic paper can be obtained here

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References


Hermes Investment Management, October 2015. Responsible Capitalism and our Society.


The next important finding was the strong correlation between ESG and CFP in the group of emerging market studies with a 65.4% share of positive outcomes. This is therefore significantly higher than in the developed markets. Excluding the proportion of mutual fund studies, the ratio increases to 70.9%. As a result, based on 52 single studies, solely focused on equity linked studies the spread to the developed markets is considerable, Figure 10.

The more compelling results from an emerging-market standpoint corresponds well with survey evidence conducted by the PRI, which finds that retail investors in emerging markets such as Brazil and South Africa appear to be more engaged on ESG issues than their counterparts in the developed world. This may reflect the greater sensitivity of these economies to climate change, pollution and mining activities. The PRI survey polled pension fund holders in the U.S., the U.K., France, Australia, South Africa and Brazil. Respondents in emerging-market countries often had the highest levels of concern when it came to the burning of fossil fuels, the use of child labor, excessive CEO remuneration and companies that made use of tax loopholes.

When asked whether they felt that how a company manages ESG issues provides an insight into how the company is run, 67% of respondents in Brazil and 58% of respondents in South Africa said they strongly agreed with this statement. This compared to less than 25% in the U.S., the U.K., France and Japan.

Moreover child labor was the number one issue of concern to investors in terms of the companies in the portfolio that might be involved in this practice, with this ranked highest in Brazil, South Africa and Australia.

Retail investors in emerging-markets such as Brazil and South Africa appear to be more engaged on ESG issues than their counterparts in the developed world.
We are very pleased to welcome back Dr. Andreas Hoepner, the Associate Professor of Finance at the ICMA Centre of Henley Business School and co-founder of Sociovestix Labs, a spin-off from the German Centre for Artificial Intelligence (DFKI) to Deutsche Asset Management. In this interview Andreas provides us with his thoughts on the evolution of ESG investing and what the future holds for the sector.

Michael Lewis: Andreas, two years ago you published a co-branded white paper with Deutsche Asset Management relating to ESG investing and how it can enhance returns and reduce risks. How has the industry and research surrounding ESG developed since 2013?

Andreas Hoepner: The trend to integrate environmental, social or corporate governance (ESG) aspects into investment processes has gained considerable momentum over the last decade. The dominant industry association, the United Nations-supported Principles for Responsible Investment (PRI), will celebrate their tenth anniversary next April. Even before this date, the number of signatories exceeds 1,400 institutions with joint net assets worth over USD 60 trillion. Much of this growth has occurred since the financial crisis of 2008/09, which shattered societal trust in the structures and relationships underlying financial markets. However, the PRI has also attracted significant new signatories in the last two years, such as the world’s largest asset owner: the Japanese Government Pension Investment Fund (GPF).

Research on ESG investing was in its infancy at the launch of the PRI in 2006. This led the PRI founder Dr. James Gifford to create a PRI academic network as early as 2008 to close the research gap between mainstream finance and ESG investing. I joined in September 2009 as the Academic Fellow and felt that we had a tremendous task on our hands to achieve that goal. However, when I wrote the co-branded White Paper in 2013 with Deutsche Asset Management, there was already much more clarity, such that ESG aspects could be deployed to enhance the return and reduce the risk of equity investment processes by those with sufficient expertise. Today, we also know that ESG aspects can have similar return-enhancing and especially risk-reducing functions when applied in shareholder engagement. Similarly, the integration of ESG criteria in fixed-income investment processes has been found to offer potential, both at the corporate and at the sovereign level.

The simple rationale for these findings is that ESG aspects are material drivers of success for many business models, but these drivers are not as crowded in terms of analysts’ attention as classic accounting variables are. Hence, detailed ESG information still offers a potential edge on the competition, where smart fund managers can see corporate strength or weaknesses well ahead of time.

There are many investment styles around. What are some of the issues that make ESG investing stand out for you?

Andreas Hoepner: ESG investing has two main advantages for an asset management business: an information edge and increased loyalty among both institutional and retail clients. However, building expertise in this area still requires an asset manager to overcome some challenges.

First, ESG investing exploits many information sources that are commercially relevant but under-sourced by the competition, since they do not adhere to a classic accounting logic. What reasoning underlies this statement? I start my line of thought at the ratio of market value of equity to book value of equity, which historically averages about 2.5. This means that the market assesses the average corporation to have a higher value potential in its discounted future earnings (i.e., ~60%) than in its net assets currently accounted for (i.e., ~40%). These discounted future earnings have to be realized through an efficient and effective execution of a well-developed corporate strategy. Who is responsible for the realization? Management. Hence, the most relevant driver of 60% of the average corporations’ market valuation is the quality of management. When conceptualizing quality of management, commonly used approaches such as the Balanced Scorecard include several intangible factors that take at least half the weight of the overall measure (i.e., “client and stakeholder satisfaction” or “organizational capacity for knowledge management and innovation”).

In summary, a substantial part of the market valuation of the average corporation is driven by intangible factors. These are, however, little understood by much of the competition since the Chartered Financial Analysts (CFA) Institute has not yet trained generations of analysts in the analysis of intangible valuation drivers.

Second, ESG investing reacts to an increasing demand for transparency from societies on financial market participants, in particular pension funds. With the World Wide Web being accessible from most parts of the globe by people of any age, especially the increasingly powerful generation of millennials (born 1980-1995), the demands to know everything about anything abound. This includes the ingredients of their food, the production conditions of their clothing and increasingly the constituents of their pension funds’ portfolios. Consequently, pension funds are now under substantial pressure by campaigns such as the Asset Owner Disclosure Project to form a view on ESG investing and, thereby, implicitly develop a second utility function beyond return/risk considerations. In other words, separate accounting managed in an ESG-integrating manner offers pension funds an additional benefit that they increasingly need to satisfy their own members. This makes the ESG separately managed account (SMA) less substitutable than a conventionally managed SMA, as many institutional sales staff will be able to confirm who has sold both ESG and conventionally managed SMAs. Similar client-loyalty effects are observable among retail clients and have led ESG investing to become rather popular in the private wealth segment.

Detailed ESG information still offers a potential edge on the competition, where smart fund managers can see corporate strength or weaknesses well ahead of time.

ESG investing reacts to an increasing demand for transparency from societies on financial market participants, in particular pension funds.
Prioritizing across industries is currently already done on a theoretical expectation basis, where analysts discuss and agree on a range of ESG aspects that should receive higher weight in certain industries. While such a theoretical materiality matrix is attractive, it does not include any information on how many competitors might already think this way and, more importantly, it does not provide financial data science evidence on what actually works. Financial data scientists these days can assess a million ESG smart beta investment opportunities in a few days and understand the vast majority of factors driving their performance either way. This allows them to pretty much pinpoint the most relevant ESG aspects in each sector that have proven to be financially material. Interestingly, those factors are often not the big ticket ESG issues everyone would expect, as they are overcrowded with competition, but less well-known ESG aspects that have a clear influence on corporate competitiveness. Hence, the future might well see considerably more sophisticated approaches than theoretical speculation to identify which ESG aspects offer the strongest financial opportunities in each sector.

So, with these strengths, what drawbacks exist for ESG investing? The drawbacks lie in (i) the lack of ESG investing training and (ii) the overcrowding of ESG themes. In terms of the first issue, the lack of training derives from ESG data sets being broadly similar to credit ratings but having little resemblance with accounting fundamentals. Hence, few people are yet trained on how to integrate ESG information effectively into investment processes. With the CFA only just starting to draft a limited number of ESG considerations into their curricula, it will take a while until training in ESG investing is the norm among financial market participants.

In terms of the second drawback, the overcrowding of ESG themes results from the limitlessness of the space. Anybody that can successfully rally several dozen people online and/or offline around a campaign with an environmental, social or corporate governance connotation can implicitly “launch” a new ESG theme. Hence, the universe of ESG themes is ever expanding and increasingly heterogeneous. Quite practically, it is difficult for analysts to identify which ESG themes are truly material in their country or sector at different points in time.

I am encouraged in this regard by recent work undertaken by Eli Reisman and his colleagues at the Sustainability Accounting Standards Board (SASB), who have been reclassifying U.S. companies in a more sustainability-oriented sector classification and are identifying the most material ESG issues within these U.S. sectors. Dismissing the most material ESG issues as seen by an authoritative source such as SASB will lead to markets becoming increasingly active— and hence efficient— with regards to these specific factors. As a result, I am hoping that SASB might decide to extend both their coverage beyond U.S. companies and to update their most material factors on an annual or at least bi-annual basis.

The next phase of development in ESG investing will address this challenge of prioritizing ESG issues across industry, country and time.

Prioritizing ESG aspects across countries can be done through the utilization of big data as it gets recorded on social media every second. These days millions of people are voicing their preferences or dislikes on a variety of topics through a post on Twitter, a search in Google or a click on topic-relevant websites. Data scientists can track this behavior to measure how much attention a specific ESG aspect receives from populations within specific countries at monthly, weekly, daily or even shorter intervals. This information then permits ESG assets to be ranked by their popularity in specific countries.

This is usually close to the differential interest in ESG aspects expressed by institutional investors from the same country. Integrated with individual, client-specific requests, such attention-based ratings of ESG aspects’ relevance provide a useful practical guide for analysts and allows them to operate within a feasible number of ESG aspects.

Big data-based technology for ESG attention measurement can also be used to assess the relevance of ESG aspects over time. For instance, a team around Dr. Darrin Borsh of the German Centre for Artificial Intelligence has developed a publicly available attention index for the topical aspect of climate change (ccai.sociovestix.com). This index clearly shows that climate change attention is rather cyclical. While attention levels peak every year during the December conference season, few people take notice of climate change during the summer break or over the Christmas holidays. Hence, the weekly change of climate change attention is less relevant than the 52-week delta. The latter, however, is quite informative, as it indicates a general higher/lower concern for the topic, which translates into more/fewer subsidies and more/fewer politically motivated investments in climate change friendly stocks or renewable energy indexes. As an anecdotal example, such investments did rather well in the months before the Copenhagen conference when 52-week attention was strongly rising. However, the equivalent investments performed badly after the conference following the lack of agreement in Copenhagen when equivalent attention figures fell dramatically.

The attention index for the topical aspect of climate change clearly shows that climate change attention is rather cyclical... 

During the same period, however, societal attention to the same ESG aspects might vary quite considerably. Hence, rather static corporate ESG ratings can be made considerably more dynamic by interacting them with ESG attention indices for the respective ESG aspects. Such DynamicESG assessment introduces a dialogical perspective that has an eye on both corporations’ behavior on ESG aspects as well as societal attention towards this very aspect. As such societal attention naturally varies considerably more than corporate ratings, DynamicESG scores display more fine-grained distributions than their more static origins. Such a feature is normally very welcome by skilled portfolio managers, as it allows them to extract more accurate signals on both upside opportunity and downside protection.

By 2020, I expect that a small group of investment managers with a deep expertise in DynamicESG will dominate the market for ESG investing. With ESG investing being essentially “investing for millennials”, I expect the ESG institutional market will continue to grow as long as millennials (i.e., those born 1980–1995) gain more and more relevance among the workforce and increase their share of pension fund inflows.

Similarly, ESG investing can be expected to make further gains in popularity among retail clients and in the private wealth segment. All of these foreseeable trends highlight how crucial the development of deep ESG investing capabilities has become at a time when only few competitor funds have displayed strong track records.

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Dr. Andreas G. F. Hoepner is an Associate Professor of Finance at the ICMA Centre of Henley Business School. He is currently also serving as the Academic Fellow to the United Nations-supported Principles for Responsible Investment (since September 2008) and as Senior Associate to the University of Cambridge’s Programme for Sustainability Leadership (since June 2013). He received his PhD from St Andrews in June 2010, where he was on faculty from February 2009 to September 2013 and built up the Centre for Responsible Banking and Finance as its Deputy Director since November 2011. He is also founding partner of a social enterprise (Sociovestix Labs) and founding president of a charity (ReFine Research) that gives social reporting awards to pension funds worldwide.
To address the increasing interest to deploy ESG-style investment techniques, in 2013 Deutsche Asset Management launched its proprietary ESG Engine. In this article, we outline the scope and reach of the ESG Engine by asset class, region and investment style.

Executive summary

Air, water and soil pollution in China, the death of over 1,100 textile employees in Rana Plaza in Dhaka Bangladesh in 2013, and the legal proceedings and regulatory investigations now surrounding Volkswagen in response to emission violations reveal how important environmental, social and corporate governance (ESG) issues have become. While the materiality of such issues is undisputed, investors are grappling with how to integrate these extra-financial factors into their investment process.

In response and in growing numbers, investors are adopting a range of ESG investment styles to address specific sustainability mega-trends such as climate change, resource scarcity and urbanization, as well as introducing screens and filters to be compliant with international codes of conduct such as the UN Global Compact or the framework put forward by the International Labor Organization.

However, integrating an ESG investment approach has typically been confined to simple exclusion screens on a specific sector or company. In many instances, these exclusion screens are being bound by legislation, for example, the Convention on Cluster Munitions (CCM). As a result, exclusion screens tend to dominate in terms of the range of ESG investment styles when measured by AuM.

To address the increasing interest to deploy ESG-style investment techniques, in 2013 Deutsche Asset Management launched its proprietary ESG Engine. The ESG Engine therefore forms part of an evolutionary process within Deutsche Asset Management since ESG Ratings have been available since 2007, Carbon Ratings since 2009 and Reputational Risks since 2011.

With the assistance from agency and NGO data, the ESG Engine ranks not just corporations, but also sovereign nations according to key performance indicators. In addition, the ESG Engine designs not just equities, but also fixed-income products in the developed and emerging world and it deploys not just exclusionary screens, but also allows filtering through a best-in-class approach as well as via defined socially responsible themes.

Through a systematic screening process, the ESG Engine has been used to create a wide range of bespoke investment products. This includes the CROCI World ESG strategy, which brings together two of Deutsche Asset Management’s key capabilities, namely equity valuation and investable strategies from CROCI and responsible investing from the ESG Engine.

In addition, a corporate fixed-income screen, a sovereign EM screen and a corporate equity and fixed-income screen have been launched, among others. The ESG Engine therefore provides a diverse and flexible range of product solutions across various asset classes and via various investment styles.

Sustainable investment opportunities

Sustainability mega-trends are presenting risks and opportunities for companies and investors. For example, two years ago 70 global investors with more than USD 3 trillion in assets under management requested 45 oil, gas, coal and utility companies to provide information on each individual company’s exposure to climate change risks both from current and future policies to reduce greenhouse gas emissions. This comes on the heels of analysis by Carbon Tracker that only 20% of the carbon embedded in the world’s fossil fuel reserves can be burnt between now and 2050 to limit an increase in global world temperatures to no more than 2 °C above preindustrial levels.

Not surprisingly fossil fuel divestments are becoming increasingly popular across a wide spectrum of the investor universe. In the U.S. in 2014, 47 money managers held AuM of USD 27 billion in 88 funds with a fossil fuel screen and 34 institutional clients had adopted fossil fuel restrictions above preindustrial levels.

International guidelines and regulation are also pushing companies and investors towards greater ESG awareness. For example, the Ottawa Convention on Anti-Personnel Mines (1997), the United Nations Global Compact (1999) and the Oslo Convention on Cluster Munitions (2010) are encouraging best practice across a wide range of issues. For more details of these and other treaties and conventions as they relate to ESG, see the Appendix at the end of this report.
A growing sector

As a result of these initiatives, ESG investment strategies are a rapidly growing segment of the investment universe. According to data from the 2014 Global Sustainable Investment Review, ESG-related AuM has grown by 61% since 2012, such that the proportion of ESG investing in relation to professionally managed assets now stands at 30.2% compared to 21.5% just two years ago. Moreover the majority of these funds are held in Europe and the United States, which combined represent 95% of the global ESG market by AuM, Figure 1.

Deutsche Asset Management’s answer

To meet growing investor demand, the Deutsche Asset Management ESG Engine was launched over two years ago. As part of the ESG Engine’s inputs and to ensure objectivity and robustness, internal and external data providers and opinions are employed to drive the results of the ESG Engine. We integrate six leading ESG rating and intelligence agencies, namely Sustainalytics, MSCI, Ethix, RepRisk, SigWatch and Oekom. Combined, these provide 1,500 data points covering 10,000 issuing entities. Deutsche Asset Management’s capital intensive approach to subscribe to external ESG intelligence secures access to the intellectual capacity and experience of more than 100 well-trained ESG specialists. The utilization of an overlapping multiplicity of data providers also ensures a high level of objectivity and redundancy (“360 view”) at low operational risk. Moreover, additional data sources may be added in future. The resulting assessments are continuously cross-checked against the corresponding information published by external bodies such as pension funds and special-purpose NGOs to form part of the ESG Engine. For example, we health check against the exclusion lists of pension funds in Denmark (ATP), Ireland, Netherlands, Sweden (AP1-AP4) and Norway, against financial institutions such as Danske Bank, Delta Lloyd, KBC, PFA and Robeco as well as data from over 15 NGOs such as Facing Finance, Amnesty International, Freedom House, Transparency International and German Watch, Figure 3.

Most ESG filters are confined to specific exclusion-based screens for equity and fixed-income issuers. However, the Deutsche Asset Management ESG Engine ranks both corporations and sovereigns on ESG issues. In addition, the ESG Engine covers equities and fixed income across the developed and emerging world and adopts not just corporate and sovereign exclusion screens, but also best-in-class techniques as well as via defined themes, such as labor practices or supply chains.

The drivers behind sustainable investing

Where it concerns exclusions, the key question to ask is why an investor would choose to avoid an investment? The driving rationale is twofold: The first is a simple consideration to voluntarily discard returns from an industry the investor does not want to be involved with. The second is to make an impact by withholding financial support to sectors or business models the investor judges not to be in line with his/her ethical standards. It is important to emphasize that Deutsche Asset Management does not take a stance as to whether or not an investment is ethically justifiable, beyond the ban of selected investments in certain jurisdictions. That decision is the sole responsibility of the investor. However, Deutsche Asset Management offers critical support with the ESG Engine to assist the client in implementing his/her bespoke investment regime.

Deutsche Asset Management offers critical support with the ESG Engine to assist the client in implementing a bespoke investment regime.
How the ESG Engine works

In the ESG Engine, the ESG classes are categorized into two groups:

1. The WHAT? The ESG class considers whether or not the corporation (or sovereign nation) is involved in potentially controversial products or services. This could mean a corporation is red flagged and excluded because of a particular ESG regime such as the defense industry. This approach can be referred to as sector-based exclusion screening and dominates the various ESG investment styles. Indeed we find that of the various ESG investment styles, exclusionary screens account for 35% and 38% of ESG by AuM in Europe and the U.S. respectively. Figure 2.

2. The HOW? The ESG class considers whether or not the corporation (or sovereign) is violating international norms when conducting business operations. For example, is the corporation in breach of labor rights or is the corporation excelling for example in diversity programs. This approach is typically referred to as norms-based screening.

Figure 2: AuM by region and investment style* (Asset value in USD trillion)

<table>
<thead>
<tr>
<th>Impact investing</th>
<th>Sustainability themed</th>
<th>Best-in-class</th>
<th>Norms-based screening</th>
<th>Engagement and rating</th>
<th>ESG integration</th>
<th>Exclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Europe</td>
<td>United States</td>
<td>Canada</td>
<td>Australia/Asia</td>
<td>Asia</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note that the GSIR adjusts the sum of these individual strategies to take account double counting since some assets are subjected to more than one strategy.

Source: Deutsche Asset Management (November 2015)

One-strike approach

It is possible to set the aggregation such that in the case of any red flag on any selected ESG class, the corporation is red flagged overall and considered non-ESG-compliant. This “one-strike” approach ensures a high level of sensitivity and reliability. While the ESG score is agnostic, the mechanics to derive the ESG verdict is client- and product-specific, such that ESG classes can easily be added or deactivated in order to meet specific client needs. This flexibility and customization is another distinctive feature of Deutsche Asset Management’s ESG Engine. The ESG compliance of a corporation applies to all securities issued by the corporation, most notably equity (including stocks, preferred stocks, ADRs, rights, etc.) but also corporate fixed income (including corporate debt, bonds, notes, etc.).

While the ESG score is agnostic, the mechanics to derive the ESG verdict is client- and product-specific, such that ESG classes can easily be added or deactivated in order to meet specific client needs.

Corporations and sovereign nations are assessed as to what degree they are involved in sectors an investor may consider controversial. In most instances, the level of involvement is measured according to the size of the revenue from a particular product or service. Primary involvement is typically related to the production of the specific product or services and secondary involvement can refer to the selling of the services or product in question. Correspondingly checks are performed as to whether or not the corporation is in breach of certain norms when conducting business. Within the ESG Engine, an ESG rating is set on an A–F scale to reflect that assessment.

Every ESG rating is translated into ESG verdicts, also on an A–F scale. The ESG verdict indicates whether the investor would deem the corporation ESG compliant with his or her investment regime. This is then translated into a red flag (E–F), a warning flag (C–D) or clearance (A–B). The ESG verdicts of a predefined list of ESG classes are aggregated to yield an ESG verdict for the specific corporation, which then drives the final investment clearance.

One of the leading international norms concerning corporate behavior was established in 2000 under the United Nations Global Compact’s 10 principles. These include business and human rights and labor rights as well as promoting environmental responsibility and working against corruption, among others.

Like corporations, sovereigns can be tested on a multiplicity of factors. Moreover, inter-relations can be analyzed and can be used for an ESG-positive selection. For example, countries that have greater freedom of press typically enjoy lower levels of corruption. Moreover democracies with more political and civil liberties, and especially freedom of the press, tend to exhibit fewer negative characteristics that would lead to an ESG-related investment exclusion.

Source: Deutsche Asset Management (November 2015)
Aside from sector- and norm-based screens for corporations and sovereigns in the developed and emerging world across equities and fixed income and via best-in-class enhancements, the ESG Engine can screen for specific theme- or impact-driven portfolios. A few examples are outlined in the fifth ESG applications stream in Figure 3 and include clean technology, HIV/AIDS programs or water consumption themes.

The ESG Engine: an innovative product

Deploying the ESG Engine filter allows compliance with leading standards for environmental, social and governance, excluding companies with material exposure to non-compliant activities and consequently providing one of a variety of ESG investment overlay solutions. One product example is CROCI World ESG, which through a systematic screening process, the ESG Engine produces the eligibility status to be used from the CROCI World ESG selection pool. The CROCI World ESG strategy therefore brings together two of Deutsche Asset Management’s key capabilities, namely equity valuation and investable strategies from CROCI and responsible investment from the ESG Engine.

While many ESG overlays are limited to simple exclusion-based screens, the selection process can be enhanced further via selecting the “best” assets. The types of best-in-class techniques are outlined in the fourth stream of Figure 3. Best-in-class starts off with a deliberate broad-band assessment of a corporation (or sovereign) where it concerns ESG. Literally hundreds of different indicators ranging from carbon footprint to board independence are assessed and aggregated to facilitate a ranking of the issuer to a reference class (like a region or sector). The investor can then for example opt for an elimination of the bottom 2.5%, a bias towards the excelling 40%, or any other worst-in-class avoidance to best-in-class selection scheme.

From here, the ESG Engine can apply another enhancement whereby the investments can be ESG-booster. This is achieved by re-weighting the individual constituents of the portfolio based on an individual corporation or sovereigns ESG rank such that ESG outperformers are weighted up and ESG underperformers are weighted down. To ensure a low tracking error, maximum weight deviations can also be applied.

The selection methodology starts from the MSCI World Index, excluding financials. From here, all non-compliant ESG stocks are removed and the remaining stocks are ranked by their respective 12-month Economic P/E. The CROCI World ESG is then comprised of the Top 75 stocks by low CROCI Economic P/E and targeting the same region weights as the MSCI World Index. Importantly, the criteria established for CROCI World ESG reflects our understanding of client ESG requirements and does not represent a Deutsche Asset Management view or judgment of certain activities. The CROCI World ESG is therefore a 75-stock, region-neutral, globally developed market equity strategy. The CROCI World ESG has a 99% correlation to the CROCI World Strategy (100 stocks), was launched in 2014 and is rated 5* by Morningstar.

Other bespoke products have included one that allows an investor to avoid investments that are deemed problematic by a bespoke ESG regime. Furthermore, it allows investments into the top ESG ranked corporate and consequently delivering a best-in-class feature. This implementation used one particular vendor as the primary source on the specific request of the client, but it allows it to fall back to other sources where appropriate. Screens have covered equity and fixed income as well as sovereign and corporate and developed and emerging markets. Figure 4 provides a few examples of ESG strategies within Deutsche Asset Management by screen, client type and AUM.

Conclusion

The Deutsche Asset Management ESG Engine brings together what we view as being the most important key performance indicators (KPIs) from external data providers and non-governmental organizations, to assess ESG compliance as defined by international guidelines or standards as well as through bespoke client requirements. These KPIs are also cross-checked with ESG screens deployed by global pension funds, financial institutions and internal processes to ensure additional robustness. From here, the ESG Engine deploys sector, norm-based and sovereign screens in the developed and emerging world across the equity and fixed-income universe. This can be simple exclusion screens as well as various best-in-class techniques and ESG overlays with specific theme or impact investments in mind.

Carsten Keil
Head of ESG Engine & Solutions

Michael Lewis
Head of Sustainable Finance Research
The universe of sustainable equity indexes has increased significantly over the past decade. In this article, we map the marketplace amid growing investor interest to divest out of fossil fuel holdings and capture emerging opportunities as the market looks to adopt low-carbon index solutions.

Executive summary

Investor demand has led to a growing number of sustainable equity indexes to be launched in the marketplace. These deploy various selection techniques from exclusionary to best-in-class to thematic approaches. The major providers across the ESG index marketplace are MSCI, FTSE and S&P Dow Jones.

In September 2010, the FTSE KLD Indexes transitioned into the MSCI ESG Indexes. The MSCI KLD Indexes, such as the FTSE KLD 400 Social Index, were originally launched in May 1990 and so MSCI can claim to provide the longest track record of sustainable indexes in the marketplace. Among their various indexes, the MSCI World SRI is the benchmark index.

In 2001, the FTSE created the family of FTSE4Good Indexes. These not only pursue similar investment styles as the DJSI family, but also included indexes with specific thematic or impact investment solutions. Within the FTSE family, the FTSE4Good Global Index is the benchmark index.

S&P Dow Jones launched a suite of sustainable equity index products in 1999. Among the DJSI family, the Dow Jones Sustainability World Index is the benchmark. This has been complemented by a range of positive exclusion and best-in-class index strategies.

Within the Deutsche Asset Management ESG family, the CROCI World ESG strategy was one of the first to be launched. This is a 75-stock, region-neutral, globally developed market equity strategy and has been run on a live basis since July 2014. Many of Deutsche Asset Management’s ESG strategies deploy the ESG Engine filter to ensure compliance with leading standards for environmental, social and governance criteria.

In this article, we examine the sustainable index providers of MSCI, FTSE and S&P Dow Jones. In future reports we will expand our coverage to include other providers such as Stoxx/Deutsche Börse. For the indexes under investigation, these can be classified according to three investment styles, which are outlined on the next page and in Figure 1.

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### Table: An overview of sustainability indexes in the marketplace

<table>
<thead>
<tr>
<th>ESG approach</th>
<th>MSCI</th>
<th>FTSE</th>
<th>Dow Jones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive/best-in-class</td>
<td>MSCI Global SRI Indexes</td>
<td>FTSE4Good Index Series</td>
<td>DJSI Broad Market Indexes</td>
</tr>
<tr>
<td>Negative/exclusion</td>
<td>MSCI Global Environment Indexes</td>
<td>FTSE All-World excluding Fossil Fuels Index Series</td>
<td>DJSI Ethical Exclusion Sub-Indexes</td>
</tr>
<tr>
<td>Thematic investing</td>
<td>MSCI Global Climate Indexes</td>
<td>FTSE Environmental Opportunities Index Series</td>
<td>DJSI Diversified Select Indexes</td>
</tr>
<tr>
<td></td>
<td>MSCI Global Sustainability Indexes</td>
<td>FTSE All-World excluding Coal Index Series</td>
<td>DJSI Diversified Indexes</td>
</tr>
<tr>
<td></td>
<td>MSCI Global Controversial Weapons Indexes</td>
<td>DJSI Blue-Chip Indexes</td>
<td>DJSI Diversified Select Indexes</td>
</tr>
<tr>
<td></td>
<td>MSCI Global Low Carbon Indexes</td>
<td>DJSI Blue-Chip Indexes</td>
<td>DJSI Blue-Chip Indexes</td>
</tr>
<tr>
<td></td>
<td>MSCI Global Fossil Fuels Exclusion Indexes</td>
<td>DJSI Blue-Chip Indexes</td>
<td>DJSI Blue-Chip Indexes</td>
</tr>
</tbody>
</table>

Sources: MSCI, FTSE, S&P Dow Jones, Deutsche Asset Management (October 2015)
Investor demand has led to a growing number of sustainable equity indexes to be launched in the marketplace—deploying selection techniques from exclusionary to best-in-class to thematic approaches.

**ESG reference indexes**

The main reference ESG indexes for each of these three respective providers are the MSCI World SRI Index, the FTSE4Good Global Index and the Dow Jones Sustainability World Index. Each deploys different techniques for index construction. The fact that the respective sector and constituent weights of each index is different reveals the subjective nature of sustainable index construction. However, from a sector perspective, financials, health care, consumer goods, technology and industrials dominate, comprising around 75% of the index with companies listed in the U.S., Switzerland, the U.K., Japan and Germany constituting the bulk of companies listed by country. A comparison of country and sector weights by respective index is illustrated in Figures 2 and 3. These charts reveal the country and sector biases among the various indexes. In the case of MSCI, we find there are a larger concentration of U.S. listings alongside greater exposure to consumer goods and services. For the DJSI family, listings are more balanced between the U.S. and Europe and there is greater exposure to health care.

**MSCI ESG Index family**

In September 2010, the FTSE KLD Indexes transitioned into the MSCI ESG Indexes. The range of MSCI KLD Indexes, such as the FTSE KLD 400 Social Index, were originally launched in May 1990 and so can claim to be the longest-running sustainable indexes in the marketplace. MSCI ESG Research provides a broad range of ESG research services analyzing all companies that are part of the MSCI All Country World Index (ACWI). ESG ratings, data and analysis from MSCI ESG Research are systematically used in the construction of the MSCI ESG Index family. MSCI provides index solutions for all major ESG investing approaches, namely best-in-class, exclusion and impact investing, Figure 4. Most MSCI ESG Indexes are designed to provide low active sector and country biases relative to their parent indexes in order to ensure a low tracking error.

**Figure 2: Country allocations of the major ESG Equity Indexes**

<table>
<thead>
<tr>
<th>Latin America</th>
<th>Other Asia</th>
<th>Other EMEA</th>
<th>Japan</th>
<th>Spain</th>
<th>Canada</th>
<th>Australia</th>
<th>France</th>
<th>Germany</th>
<th>Switzerland</th>
<th>U.K.</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td>90</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 3: Sector allocations of the major ESG Equity Indexes**

<table>
<thead>
<tr>
<th>Utilities</th>
<th>Oil and gas</th>
<th>Consumer services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telecommunications</td>
<td>Basic materials</td>
<td>Industrials</td>
</tr>
<tr>
<td>Technology</td>
<td>Consumer goods</td>
<td>Health care</td>
</tr>
<tr>
<td>Financials</td>
<td></td>
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</tbody>
</table>

**Figure 4: The family of MSCI ESG Indexes**

<table>
<thead>
<tr>
<th>Positive/best-in-class</th>
<th>Negative/exclusion</th>
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</tr>
<tr>
<td>MSCI Global Low Carbon Indexes</td>
<td>MSCI excluding Controversial Weapons Indexes</td>
<td>MSCI Global Fossil Fuels Exclusion Indexes</td>
</tr>
</tbody>
</table>

**Figure 5: The MSCI Global Socially Responsible Indexes exclude companies that are inconsistent with specific values-based criteria and specifically companies involved in the following activities: alcohol, civilian firearms, gambling, military weapons, nuclear power, tobacco, adult entertainment and genetically modified organisms. Additionally, these indexes target companies with high ESG ratings relative to their sector peers, to ensure the inclusion of best-in-class companies from an ESG perspective. Sector weights are also closely aligned to the relative sector weights of the underlying MSCI Global Investable Market Indexes to limit the systematic risk introduced by the ESG selection process. The composition of the MSCI Global Socially Responsible Indexes are reviewed on an annual basis in May and rebalanced in August, November and February.

Unlike the MSCI Global Socially Responsible Indexes, which use negative or exclusionary screens, the MSCI Global Sustainability Indexes are constructed by applying a best-in-class selection process to companies in the regional indexes that make up the MSCI ACWI. The methodology aims to include securities of companies with the highest ESG rating representing 50% of the market capitalization in each sector and region of the parent index. Companies that are not existing constituents of the Global Sustainability Index family must have an MSCI ESG Rating of “BB” or above and an Impact Monitor score of 3 or above to be eligible.
Exposure assessment

Data range

Incorporating the ESG ratings...
The FTSE4Good Index Series has been designed to create a family of benchmark and tradable indexes in response to the growing interest in socially responsible investment around the world. Within the FTSE4Good Series, there are currently five indexes:

1. FTSE4Good Global Index
2. FTSE4Good USA Index
3. FTSE4Good Europe Index
4. FTSE4Good U.K. Index
5. FTSE4Good Japan Index

The FTSE also compiles specific thematic indexes with an environmental or ESG bias, Figure 7. The FTSE All-World excluding Fossil Fuels Index Series is a market-capitalization weighted index designed to represent the performance of the constituents of the FTSE All-World Index after the exclusion of companies that have a certain revenue and/or reserve exposure to fossil fuels.

This is becoming increasingly relevant for global investors due to the downward revaluation risks associated with stranded assets. Stranded assets are fossil fuel deposits that must remain unburned or in the ground for the world to avoid the worst impacts of climate change. The U.K. and Canadian stock markets are particularly exposed in this regard given the large share of fossil fuel companies listed on their domestic stock exchanges as measured by market cap. Meanwhile, the FTSE All-World excluding Coal Index Series is designed to represent the performance of companies of the FTSE All-World Index after the exclusion of companies that have certain exposure to coal mining or general mining and/or reserve exposures to coal.

The FTSE also compiles specific thematic indexes with an environmental or ESG bias, Figure 7. The FTSE All-World excluding Fossil Fuels Index Series is a market-capitalization weighted index designed to represent the performance of the constituents of the FTSE All-World Index after the exclusion of companies that have a certain revenue and/or reserve exposure to fossil fuels.

The FTSE Environmental Technology Index Series measures the performance of companies globally whose core businesses is the development and deployment of environmental technologies as defined by the FTSE Environmental Markets Classification System (EMCS). These include renewable and alternative energy, energy efficiency, water infrastructure and technology, waste management and technologies, pollution control, environmental support services and food, agriculture and forestry. Forming part of the overall FTSE Environmental Markets Index Series, the FTSE Environmental Technology Index Series requires companies to have at least 50% of their business derived from environmental markets and technologies, e.g., renewable and alternative energy, pollution control, etc.

The FTSE Environmental Opportunities Index Series includes a fixed number of companies that derive at least 50% of their business from environmental markets and technologies, e.g., renewable and alternative energy, energy efficiency, etc., to coal.

The FTSE4Good All-World Index Series includes only companies that meet certain ESG criteria, especially a minimum FTSE ESG Rating, and excludes companies manufacturing tobacco, weapon systems and components for controversial weapons.

Dow Jones Sustainability Index family

Launched in 1999, the Dow Jones Sustainability Indexes (DJSI) track the stock performance of the world’s leading companies in terms of economic, environmental and social criteria. Dow Jones uses a best-in-class approach by deploying RobecoSAM’s Corporate Sustainability Assessment (CSA) methodology, which assesses a company’s sustainability profile. This entails RobecoSAM every March inviting the world’s largest 3,400 publicly traded companies to participate in the annual CSA. This means that no sector of the global economy is excluded from the process as the assessment aims to identify the best companies in each industry.

A total of 59 industry groups, derived from the GICS industry classification system, are analyzed by RobecoSAM using industry-specific questionnaires featuring 90–120 questions. However, for companies that choose not to respond to the CSA questionnaire and that meet certain size criteria, RobecoSAM complete the questionnaire to the extent possible, based on publicly available information.

Companies are evaluated on a range of financially relevant sustainability criteria covering the economic, environmental and social dimensions, Figure 8. The actual criteria used within the questionnaire will vary from industry to industry to reflect industry-specific drivers. Each criterion can contain between 2–10 questions. Source: RobecoSAM (April 2015).

Deutsche Asset Management Center for Sustainable Finance | A guide to benchmark sustainable equity indexes

Deutsche Asset Management Center for Sustainable Finance | A guide to benchmark sustainable equity indexes
The suite of Deutsche Asset Management ESG strategies

Deutsche Asset Management offers a range of ESG-focused strategies. As outlined in the previous article, the ESG Engine is used to create a wide range of bespoke investment products. The engine applies a proprietary aggregation methodology to data obtained from leading third-party experts who determine whether there is an underlying ESG exposure. One of the first investment products was the CROCI World ESG strategy. This has now been complimented by a range of alternative screens including a corporate fixed income and a sovereign EM screen, among others. For the CROCI World ESG strategy, the selection methodology starts from the MSCI World Index, excluding financials. Once all non-compliant ESG stocks are excluded, the remaining stocks are ranked by their respective trailing 12-month economic P/E. Figure 13 details the list of CROCI ESG criteria based on controversial business activities as well as breaches of norms while performing business activities in accordance with the UN Global Compact. The economic P/E ratio is a valuation of a company’s additional reserves and liabilities, which is tracked and systematically adjusted by the CROCI team. The idea is to make companies comparable regardless of region and/or sector. The top 75 stocks are then selected and in order to ensure region neutrality, the same weights as the MSCI World Index are targeted. As a result, the CROCI World ESG strategy is a 75-stock, region-neutral, globally developed market-economy strategy and has been run on a live basis since July 2014.

The CROCI World ESG strategy has a 99% correlation to the CROCI World Strategy (100 stocks) and brings together two of Deutsche Asset Management’s key capabilities: equity valuation and investable strategies from CROCI and ESG strategy. This has now been complimented by a range of CROCI World ESG strategies. This has now been complimented by a range of ESG strategies. Within Deutsche Asset Management, our suite of ESG indexes deploys the ESG Engine filter to ensure compliance with leading standards for environmental, social and governance to provide a variety of ESG investment overlay solutions.

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References
China and the U.S. are taking steps to reduce emissions. This will not only go some way to address the pollution crisis in China, but also the threat climate change poses to broader financial stability around the world. In this article we examine the likely transformation of the Chinese economy in the years ahead and the sector opportunities that will ensue.

The potential investment implications

At the end of last year 195 countries covering 90% of global emissions agreed to take action to tackle climate change. This marks a significant improvement in the plans and measures national governments are adopting to curb greenhouse gas emissions since the last climate agreement was signed in Kyoto 18 years ago, which covered just 11% of global emissions.

The implementation of these plans will aim to shape the approximately USD 90 trillion that is likely to be invested in infrastructure in the world’s urban, land use and energy systems. According to the New Climate Economy report, the nature of these investments will shape future patterns of growth, productivity, living standards and global emissions, as well as representing new business opportunities for companies and investors.

The path towards emission reduction has been made somewhat easier over the past decade by the decoupling of economic growth in the OECD to greenhouse gas emissions, since historically these two factors have been positively correlated. This decoupling has been confirmed recently by an International Energy Agency study that showed that global emissions stagnated last year while global GDP rose by 3.4%.

However, the history of non-OECD CO2 emissions is less encouraging. We find that since 2000 global emissions from the consumption of energy have risen by approximately 40%, of which just over a half is attributable to China, Figure 1. Even here, there is room for optimism since China is now on a path of transforming its industrial base and energy mix. However, estimates suggest that current individual country pledges still imply global temperatures rising by 2.7 °C compared to preindustrial levels by the end of the century. As a result, this goes beyond the 2 °C level, which is widely believed to pose risks to the global economy and hence asset price valuations.

These risks and specifically the linkages between climate change and financial stability have been brought to the forefront of investors’ minds recently following the “Breaking the Tragedy of the Horizon” speech given by the Governor of the Bank of England to Lloyds of London at the end of September.

An examination of Munich Re data reveals not only that the number of weather-related natural disasters has trebled over the past three decades, but that inflation-adjusted losses have increased fourfold over the same period, Figures 2 and 3. While the insurance industry has been able to manage these risks, other sectors of the economy are less prepared, particularly in the event of legislation to tackle climate change that encourages the transition to a low-carbon economy.

Figure 1: CO2 emissions by major countries/regions (CO2 emissions from the consumption of energy in billions of tonnes)

![Figure 1: CO2 emissions by major countries/regions](image)

Source: US EIA/DOE (End 2012)

Figure 2: Weather-related and geophysical “loss events” worldwide (number of events*)

![Figure 2: Weather-related and geophysical “loss events” worldwide](image)

* A natural-catastrophe loss event is defined as an event where the report of the event suggests a direct loss from damaged property and/or loss of human life. Sources: Munich Re NatCatSERVICE, BoE Prudential Regulation Authority (September 2015)
Investors therefore need to consider the implications of active governance to cut carbon emissions, on the one hand, and a more significant rise in global temperatures, on the other. In both scenarios we would see important asset market implications.

For example, a strengthening commitment to keep the rise in global temperatures to no more than 2 °C would likely be accompanied by a steady increase in the level of carbon prices and the cost competitiveness of renewable energy with fossil fuels. This would not only encourage the transformation towards a low-carbon economy, but also raise stranded asset risk, that is the amount of fossil fuel reserves that breach the permissible carbon budget to limit global temperatures rising beyond permissible levels.

A global climate agreement and an acceleration of the low-carbon transition will likely accelerate the divestment out of fossil fuel assets. From a regional stock market perspective, we find that EMEA, Canada, the U.K., the U.S. and then Latin America have the highest exposure to the energy sector when measured by market capitalization, Figure 4. Consequently more aggressive climate action could have a disproportionate impact on these stock markets.

We would expect that more aggressive climate change action would also encourage a further acceleration in the number of institutions investing in low-carbon investment products as part of their efforts to reduce the carbon footprint of their global portfolios. As mentioned earlier in this report, this has already occurred to some degree with, for example, the Swedish National Pension Fund (AP4) and the Fonds de Réserve pour les Retraites (FRR) in France investing in the MSCI Low Carbon Leaders Indexes.

From a fixed income and specifically sovereign perspective, those economies with a greater dependency on fossil fuels in terms of exports and fiscal revenues are likely to be most exposed to a more aggressive program of GHG emission reduction. At the same, such measures would most likely be accompanied by a further deepening in the Green and Climate Bond markets. In fact establishing a green financial system has become an important pillar of government policy in China. In the Chinese government’s 13th Five Year Plan (2016–2020) has become an important pillar of government policy in China. Moreover, we will witness significant investment in energy efficiency and reduce energy and carbon intensity improvements. However, in the event that GHG emission reduction efforts do not go far enough, then this would have implications for rental incomes and insurance costs and ultimately physical losses in response to adverse weather events.

Figure 5 shows how China still lags far behind the rest of the world in terms of clean energies as a share of total energy consumption. As of 2014, clean energies accounted for only 16% of total energy consumption in the OECD compared to just 16% in China. Excluding natural gas and focusing solely on non-fossil fuels we find that China’s share relative to total energy consumption stood at 10.9% in 2014 compared to an OECD average of approximately 20%. These reveal the significant scope for clean energy growth in China over the years ahead.

From an investment standpoint, China has maintained its position as the world’s largest renewable energy investor in 2014, Figure 6, committing more than double the investment of the U.S., its nearest rival. The Chinese government also plans to set aside funding for Green Bonds of USD 725 billion to grow the clean energy and environmental sectors.

The major beneficiaries of this transformation will be felt across the clean energy sectors such as solar, wind, hydrogen, biofuels, compressed natural gas technologies, power storage and electric vehicles. In addition, efforts to improve energy efficiency and reduce energy and carbon intensity should have important implications for the lighting, power distribution and buildings market sectors, as well as real estate assets, while environmental resource management will affect the water, waste management, soil reclamation and clean agricultural sectors.

From a clean energy investment standpoint, wind and solar have captured the lion’s share of investment in China over the recent years. According to data from Bloomberg Energy Finance, China accounted for over two thirds of wind financing in the developing world last year. In terms of solar, the country accounted for a quarter of global investment in 2014. According to Deutsche Bank analysis published earlier this year, in markets heavily dependent on coal for electricity generation, the ratio of coal-based wholesale electricity to solar electricity cost was 7:1 four years ago. This ratio is now less than 2:1 and could likely approach 1:1 over the next 12–18 months. The cost of solar installations could continue to fall by ~40% by the end of 2017. As a result, we expect new business models will emerge with significant potential shareholder value, focused on the downstream value chain.

These targets provide a clue to the significant investments required, particularly in infrastructure, to transition to a low-carbon economy not just in China but globally. It also highlights the risks to high-carbon assets such as coal-fired power stations as well as to the transportation sector, which accounts for around 25% of global greenhouse gas emissions.

Another area of potential adjustment will be in the real estate/commercial property sector where there has been increasing financing to support energy efficiency and renewable energy improvements. However, in the event that GHG emission reduction efforts do not go far enough, then this would have implications for rental incomes and insurance costs and ultimately physical losses in response to adverse weather events.

**Conclusion**

Investors need to consider how a range of outcomes as they relate to carbon emissions and the likely path of global temperatures will affect portfolio valuation over the longer term.

In our view, stranded asset risk will remain a source of market uncertainty with certain stock markets more exposed than others. In addition, we expect climate change action should also encourage a further acceleration in the number of institutions investing in low carbon investment products as part of their efforts to reduce the carbon footprint of their global portfolios. This should increase the appeal of fossil fuel exclusion screens and low-carbon index products.

From a sustainable investments perspective, we see considerable growth in clean technology adoption most notably in China. Moreover, we will witness significant investment in infrastructure across the energy and transportation sectors in order to support the transition to a low-carbon economy. It also exposes those high-carbon assets that are unable to adapt, for example coal-fired powered generators that are not compatible with carbon capture and storage.

**Michael Lewis**
Head of Sustainable Finance Research

**References**

Sustainable finance events in the year ahead

<table>
<thead>
<tr>
<th>Upcoming events and conferences 2016</th>
<th>Source: Deutsche Asset Management (February 2016)</th>
</tr>
</thead>
<tbody>
<tr>
<td>February 23–24 Tokyo, Japan</td>
<td>Responsible Investor Asia 2016 conference</td>
</tr>
<tr>
<td>February 25–26 Venice, Italy</td>
<td>San Giorgio Group climate finance meeting</td>
</tr>
<tr>
<td>March 15–17 Abu Dhabi, UAE</td>
<td>18th Microcredit Summit</td>
</tr>
<tr>
<td>March 2–3 New York, U.S.</td>
<td>Social Performance Task Force Investor Working Group meeting (DB hosting)</td>
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<tr>
<td>March 2–4 Vancouver, Canada</td>
<td>GLOBE Leadership Summit for Sustainable Business</td>
</tr>
<tr>
<td>March 7–12 Beijing, China</td>
<td>National Peoples’ Congress formally passes 13th Five Year Plan</td>
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<tr>
<td>March 15–16 London, U.K.</td>
<td>Economist Sustainability Summit 2016: Adapt or die?</td>
</tr>
<tr>
<td>March 23 London, U.K.</td>
<td>G20 Green Finance Study group</td>
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<tr>
<td>April 4–5 New York, U.S.</td>
<td>Bloomberg New Energy Finance Summit</td>
</tr>
<tr>
<td>April 22</td>
<td>Earth Day 2016</td>
</tr>
<tr>
<td>April 26–27 Chicago, U.S.</td>
<td>Impact Capitalism Summit</td>
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<tr>
<td>May 4–5 Boston, U.S.</td>
<td>Corona Conferences 2016: Sustainability in the Age of Disruption</td>
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<tr>
<td>May 17–20 U.S.</td>
<td>Five Fund Forum</td>
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<tr>
<td>May 18–20 Amsterdam, Netherlands</td>
<td>GRI Global Conference – Empowering Sustainable Decisions</td>
</tr>
<tr>
<td>July 20–21 Nantucket, U.S.</td>
<td>Impact Capitalism Summit</td>
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<tr>
<td>September 6–8 Singapore</td>
<td>PRI in Person 2016</td>
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<tr>
<td>October San Francisco, U.S.</td>
<td>SOCAP18 conference</td>
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<tr>
<td>October Amsterdam, Netherlands</td>
<td>TBLI (Triple Bottom Line Investment) Europe conference</td>
</tr>
<tr>
<td>October 13–16 U.S.</td>
<td>Five Fund Forum</td>
</tr>
<tr>
<td>November Hangzhou, China</td>
<td>G20 Summit</td>
</tr>
<tr>
<td>December 7 Amsterdam, Netherlands</td>
<td>GIIN Investor Forum</td>
</tr>
</tbody>
</table>

A historical timeline for major sustainable finance events

1961 UN declaration on the prohibition of the use of nuclear and thermonuclear weapons http://www.un.org/documents/declaration.htm
1974 Geneva convention on weapons that may cause unnecessary suffering or have indiscriminate effects http://www.ircrc.org/applied/ihl/ihlrsf/vw/TreatiesByCountrySelected.jsp?xp_countrySelected=PK
1976 International covenant on economic, social and cultural rights http://www.ohchr.org/EN/ProfessionalInterest/Pages/GESCR.aspx
1977 Geneva convention and protocol 657–58 that are the legal basis for negative case on CCW & WMD http://www.unodc.org/unodc/en/treaties/CAC/
1984 Covenant on civil and political rights and general comment #14 on nuclear weapons and the right to live http://www.ohchr.org/EN/ProfessionalInterest/Pages/CAT.aspx
1997 Ottawa convention on anti-personnel mines http://www.ilo.org/ils/INTRO/580
1999 UN global compact http://www.unglobalcompact.org/
2000 UN millennium development goals http://www.un.org/millenniumgoals/
2002 Extractive industries transparency initiative http://eiti.org/
2004 Roundtable on sustainable palm oil http://www.rspo.org/about
2006 Principles for Responsible Investment http://www.unpi.org/
2010 Oslo convention on cluster munitions (CCM) http://www.clusterconvention.org/
2011 Equator principles http://www.equator-principles.com/
2012 IFC performance standards http://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_site/Sustainability disclosed
2015 UN sustainable development http://sustainabledevelopment.un.org/?menu=1300

Source: Deutsche Asset Management (December 2016)
Asset Owner Disclosure Project is an independent not-for-profit global organization whose objective is to protect retirement savings and other long-term investments from the risk posed by climate change by improving disclosure and industry best practice.

Best-in-class investment approach focuses on companies that have historically performed better than their peers within a particular industry or sector on measures of environmental, social or corporate governance issues. This typically involves positive or negative screening or portfolio tilting.

Carbon footprint is the sum of GHG emissions measured in CO₂ equivalents for a specified company, product or service.

Clean technologies are aimed at reducing or eliminating environmental pollution.

Climate change is a long-term shift in the planet’s weather patterns or average temperatures. Scientific research shows that the average temperature of the planet’s surface has risen by 0.89 °C from 1901 to 2012.

CO₂ refers to carbon dioxide, the most common greenhouse gas.

Corporate financial performance (CFP) is a term widely used within academia to refer to the financial or economic performance of a company. In general, academic studies have tended to focus on either financial accounting measures or economic measures to measure, rank and compare the CFP of different companies.

Corporate governance is the procedure and/or processes according to which an organization is directed and controlled. Corporate governance specifies the distribution of rights and responsibilities among the different participants in the organization such as the board, managers, shareholders and other stakeholders, and lays down the rules and procedures for decision making.

Ethical investment is an investment philosophy guided by moral values, ethical codes or religious beliefs. Investment decisions therefore include non-economic criteria and typically are associated with negative (or exclusionary) screening.

ESG refers to environmental, social and corporate governance and has emerged as the term to describe the issues that investors consider in the context of corporate behavior. No definitive list of ESG exists but they typically display one or more of the following characteristics: (i) issues that have traditionally been considered non-financial or not material; (ii) a medium- or long-term time horizon; (iii) qualitative objectives that are not readily quantifiable in monetary terms; (iv) externalities not well captured by market mechanisms; (v) a changing regulatory or policy framework; (vi) patterns arising throughout a company’s supply chain; and (vii) a public-concern focus.

Greenhouse gases (GHG) are gases, such as carbon dioxide, methane and nitrous oxide, that allow sunlight to enter the atmosphere freely, but when sunlight strikes the Earth’s surface, some of these gases are reflected back towards space as infrared radiation (heat), which greenhouse gases absorb.

Impact investing refers to investments made into companies, organizations and funds with the intention of generating a measurable, beneficial social or environmental impact alongside a financial return.

Kyoto Protocol is an international treaty on climate change that set emission levels for the reduction of greenhouse gases. Signed in Kyoto in December 1997 it came into force in February 2005.

Meta-analyses aggregate findings of academic studies econometrically. They directly import effect sizes and sample sizes of primary studies to compute a summary effect across all primary studies.

Millennials typically refer to the generation cohort with birth years ranging from the early 1980s to the early 2000s.

The United Nations-supported Principles for Responsible Investment Initiative was launched in 2006 and is an international network of investors working together to put the six Principles for Responsible Investment into practice. Its goal is to understand the implications of sustainability for investors and support signatories to incorporate these issues into their investment decision making and ownership practices. In implementing the principles, signatories contribute to the development of a more sustainable global financial system.

Renewable energy is defined as energy that comes from a source that is not depleted when used, such as wind or solar power.

Shareholder engagement is the practice of monitoring corporate behavior and seeking changes where appropriate through dialogue with companies or through the use of share ownership rights, such as filing shareholder resolutions. Shareholder engagement is often employed in attempts to improve a company’s ESG performance.

Sustainable investment is a form of investing that combines investors’ financial objectives with their concerns about environmental, social, ethical and corporate governance issues. In some instances this is also referred to as socially responsible or ethical investing.

Sustainability or sustainable development refers to the concept of meeting present needs without compromising the ability of future generations to meet their needs. It encompasses social welfare, protection of the environment, efficient use of natural resources and economic well-being.

Values-driven screening is defined as an investment approach that excludes some companies, sectors or sovereign nations from the investment universe based on criteria relating to their policies, actions, products or services. Investments that do not meet the minimum standards of the screen are not included in the investment portfolio. Criteria may include environmental, social, corporate governance or ethical issues. For example, specific industries or sectors such as weapons manufacturers, or specific companies considered to be poor ESG executives.

Vote-count studies typically count the number of primary academic studies with significant positive, negative and non-significant results and “votes” the category with the highest share as winner.
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