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Big data shakes
up ESG investing



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Cover story
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Investors have long attempted to incorporate ESG information into their stockpicking decisions, however, ESG funds have underperformed the market. This issue shows how the latest developments in artificial intelligence and machine learning are finally giving investors the upper hand. Big data catches out 'greenwashing' and provides forward-looking market signals that outperform the market. This is a boon for investors who want to determine how ESG issues affect the fair value of stocks.

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Editorial

It is strange that while nine of ten of the world's largest fund managers claim to have a responsible investing mandate, just two-fifths actually incorporate environmental,

social, and governance factors into their calculation of a stock's fair-value. It seems that investment analysts have trouble translating non-financial ESG information into investible data. All the while, ESG-focussed assets under management are expanding at the scorching pace of almost 20 per cent each year.

This is where the latest developments in artificial intelligence and big data will help. Machine learning now makes it possible for algorithms to infer context as they sift through non-standard financial information. The evidence shows this creates buy and sell signals that outperform the market compared with traditional algorithms that underperform after merely aggregating key word data or tracking changes in company filings.

The value of ESG data has been increasingly recognised by sovereign wealth and large pension funds. It is not only a way to de-risk

portfolios, it also allows a response to changing public opinion. Generational change is also a factor, with younger investors more likely to support responsible investing, than in the past. Meanwhile, there is an increasing recognition of ESG's macroeconomic benefits, including boosting labour force participation, and reducing worker disabilities among other benefits. Professional and public opinion is therefore likely to support ESG for some time to come.

In this fourteenth edition of Konzept, Deutsche Bank Research's flagship magazine, we take a look at the best new ideas emerging in the responsible investing universe, with an encouraging but critical eye. Our cover stories describe the result of Deutsche Bank's new α -Dig artificial intelligence system. After scouring data from 1,000 organisations, the machine learning infrastructure infers the context of an ESG report. It sidesteps the logorrhoea to approach reality. When this information is used to generate 'buy' and 'sell' signals, it generates strong outperformance.

Moreover, training α -Dig's machine algorithms on natural language in press reports also helps identify key turning points

for a company. For instance, when the words “accused” and “settlement” appear in the same news article, traditional keyword aggregators have trouble determining which one should be prioritised and thus whether the article is a negative or positive indicator for a stock. By inferring context, α -Dig can generate outperformance of two percentage points over the next four months.

Moving along, we also examine how big data can help investors wade through the tide of ‘greenwashing’, where companies file voluminous disclosures related to sustainability that are ultimately opaque and meaningless. Here, traditional ESG ratings systems are often overwhelmed.

In a different type of macro piece, we show that social and governance issues are not a luxury that economies should adopt only once they are developed. Rather, the evidence demonstrates that strong policies are a requirement for economic growth.

On the environmental side, we worry that many analysts wrongly emphasise a company’s immediate carbon emissions without accounting for those emerging from its supply chain. That

the comparison is nearly meaningless can be seen in the fact that Samsung’s immediate carbon emissions are 150 times more than Apple’s. Yet when the overall supply chain is taken into account, the difference is much smaller. Meanwhile, the increasing popularity of green bonds obscures important issues that need resolving, including the need for a consistent definition across geographies and the growing expense of certification.

Finally, we look at the burning governance questions of the day. We lay out five radical ideas to improve the auditing profession. Meanwhile the controversy of whether dual-class shares ought to be encouraged is resolved with four common-sense suggestions, including restricting the use perpetual dual-class shares outright.

Summaries of all the pieces are included at the front to whet the palate. Do enjoy the articles, and we look forward to hearing your thoughts and comments.

Jim Reid
Global Head of Fundamental Credit Strategy
and Thematic Research

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Summaries



ESG and big data – Investing with Alpha-Dig Andy Moniz, Spyros Mesomeris, Luke Templeman

Almost as fast as modern algorithms have begun to search news sources and company reports for non-financial (particularly ESG-related) information, companies have responded by being more savvy with their wording. Now, sophisticated artificial intelligence is needed to learn and infer context. Deutsche Bank's new α -Dig system does exactly this. Consider that a portfolio that goes long stocks that make few material (but subjective) changes to reports, and shorts stocks that do make changes, outperforms by 188 basis points per month. This type of big data analysis is quickly becoming the future of investing.

ESG and big data – New ways to catch greenwashers

Andy Moniz and Spyros Mesomeris

Increased focus on ESG issues has led some companies to make their disclosures more voluminous but more opaque. Consequently, traditional ESG ratings systems have been overwhelmed by the 'greenwashing' effect. We use Deutsche Bank's new α -Dig artificial intelligence system to read the ESG reports from 1,000 organisations to learn which indicators suggest future share price under and out-performance. Some unexpected results show how a company's ESG goals, metrics, sentiment, and lexical diversity all impact its future returns.

ESG and international development – A necessity, not a luxury

Jim Reid, Luke Templeman, Sahil Mahtani

Far from being a luxury to be indulged in after sufficient economic growth, boosting social and governance standards might underpin it, even for developing countries. Connecting the micro and the macro evidence, we posit that increasing workforce diversity can lead to higher labour force participation; that reducing work-related injuries can boost output by several percentage points; that moderating executive compensation can boost asset returns. Meanwhile, ESG transparency across the corporate sector can lower the cost of capital and moderate the effect of economic downturns. ESG is not just good public policy, it is good for hard economic reasons.

Scope three emissions – Sorting the mickle from the muckle

Caroline Cook

Should investors care that Samsung's 'scope

one and two' carbon emissions are 150 times higher than those of Apple even though the companies have similar revenue? No. Yet too many ESG investors still incorrectly compare 'scope one and two' data purely because it is the most widely disclosed. That is a mistake. They should push for greater visibility of 'scope three' data that takes into account the emissions along a company's supply chain. Where companies do not disclose 'scope three' data, the misalignment between the company's value and the volume of its emissions can be analysed under the Deutsche Carbon Alignment Framework.

Equities – How fund managers can use ESG to assess fair value

Jan Rabe

It seems odd that nine out of ten of the world's largest fund managers claim to have a responsible investment mandate, yet only two-fifths admit they systematically consider ESG factors when assessing a stock's fair value. One problem is that traditional ESG ranking systems are backwards looking. Deutsche Bank's new forward-looking framework can help. Using this we find the market does not account for the ESG risks and opportunities of many stocks and that our 'ESG leaders' outperform the market over time, yet can be rated just like lesser stocks.

Governance – Five radical ideas to improve audits

Luke Templeman

About the only auditing issue investors seem to agree on is that the profession needs reform. As many existing ideas have stalled, we present five radical ones to reignite the conversation. We consider combining consulting and audit departments, how auditors might be appointed by regulators, new auditor disclosures, short-term tenures, and why changing management incentives would discourage aggressive accounting. The ideas all have drawbacks, but it may be time to consider these 'left-field' suggestions.

Bond markets – The pickles of green finance

DB Analysts

Some people are sceptical about the idea of green bonds, calling them nothing more than a marketing gimmick, and certainly some firms are liberal in their labelling. But green bonds have taken off in a big way, and at current growth rates will comprise over 15 per cent of the global corporate bond market. Yet, there are three key challenges for investors. First, there is currently no official definition on what constitutes a green

bond, with significant differences across geographies. Second, 'greenwashing' is a real challenge. Third, as the market grows, additional expenses associated with green bonds will increase.

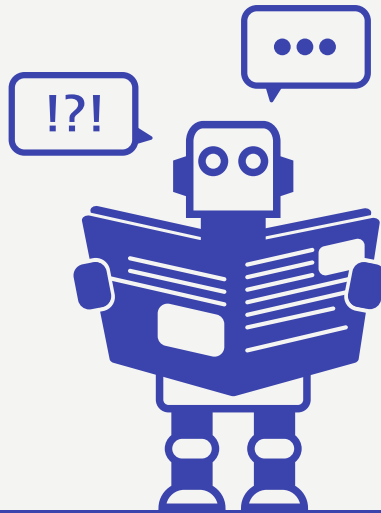
Equities – ESG with one eye on the macro Andreas Bruckner, Sebastian Raedler

ESG investing may be subject to a wider array of macro fluctuations than initially meets the eye. For one thing, most ESG-friendly European stocks are highly cyclical—with a disproportionate capital goods tilt—and tend to outperform the market in periods of rising bond yields and buoyant equity prices. In fact, European capital goods have become increasingly exposed to emerging markets, and as such their performance is correlated with movements in Chinese PMIs. Nevertheless, the sector has strong defensive qualities and appears to be relatively immune to the waves of technological change that are disrupting many other European industries. That, in combination with its high ESG scores, and the rebound in euro area growth momentum, should stand it in good stead for the near future.

Dual-class shares – Billionaires and their offspring Sahil Mahtani

Dual-class shares are controversial but seemingly inevitable. On the one hand, companies like Viacom show how differentiated voting structures can go awry. On the other, companies like Google and Facebook show how they can help companies prosper. Three common-sense suggestions present themselves. First, perpetual dual-class shares should be prohibited. There is no good reason to entrench the power of a managerial class across generations, removing them from market discipline forever. Second, simplicity should be a key operating principle, with dual-class shares permitted for certain fast-growing firms, but not for all firms. Third, reducing the voting gap between the classes of shares can help moderate the excess concentration of power.

ESG and big data – Investing with Alpha-Dig



To understand just how wrong some financial algorithms can be, consider the ‘Hathaway effect’. In 2012, an American researcher noticed that each time a film was released starring Anne Hathaway, there was a jump in the share price of Warren Buffett’s Berkshire Hathaway. Just as curious was the correlation that developed between news stories that mentioned “Hathaway” (which frequently focussed on the Hollywood actress) and Berkshire’s share price.

The likely cause of this odd relationship was algorithmic systems that traded based on keyword searches of news articles. That story neatly highlights the problems with using regular trading algorithms to search unstructured data sources.

For a more poignant example, consider the following extract from a news article in early 2017. It discusses a governance issue at Rolls Royce.

Bribery at Rolls Royce dated back to 1989 and company leadership knew about the issue in 2010 but failed to notify authorities according to prosecutors and a judge’s ruling that were part of a global anti-corruption settlement ... It reached a settlement agreeing to pay more than \$800m to

resolve allegations it paid bribes.

Turning a news article like this into investable data has been attempted for some time. Typically, a data vendor will use an automated search tool to scan a million or so sources for pre-defined keywords that fall under the umbrella of environmental, social, and governance issues. An analysis of key word counts is then used to build a picture of the company. In this instance, a search for “bribery”, “failed to notify”, or “prosecutors” would suggest the article is a negative ESG indicator. But that ignores the article’s context that the case has been settled.

Here’s another example using lines from two different news articles:

*... the drug assisted hard-of-hearing patients ...
... a high-court hearing on Friday will determine damages ...*

Of course, a human could easily understand the context of the word “hearing” in the above two articles. The first usage is clearly positive while the second is negative. A human can also understand any dependency between news stories. But a human can’t read through a million

Andy Moniz, Spyros Mesomeris, Luke Templeman

news articles. The only way context can be understood when analysing a large quantity of non-financial data is to utilise sophisticated artificial intelligence and train machine learning algorithms.

That is the point of Deutsche Bank's new α -Dig system. Indeed, this type of intelligent software has learnt to look at the news articles and, in the Rolls Royce case above, has learnt that in this particular context the priority words are "settlement", "agreeing to pay", and "resolve". As a result, the article will be flagged as a positive ESG indicator. In this specific case, within six months of the release of the article, Rolls Royce's stock had outperformed the broader European index by one-quarter, completely erasing its underperformance of the prior six months.

That sort of performance by a stock involved with litigation is not unusual but the timing of the market response can be surprising. This is where the opportunity for big data and machine learning lies. Our models show that, on average, companies outperform their peers by two percentage points after the announcement of a litigation settlement but this does not happen immediately. That is because investors are very inefficient at digesting ESG information and, as a result, the gains and losses from these data take time to manifest. Indeed, between the day before and the day after the announcement of an average litigation settlement, there is almost no stock return. Even two months after the announcement, the average stock has gained less than one per cent relative to the market. It takes a full four months for the two percentage points of outperformance to be realised.

The problem for investors is that, like litigation, most ESG events are very difficult to quantify and time. But as the Rolls Royce example above shows, investors who can identify and quantify ESG events can outperform the market.

Portfolio performance extends far beyond mere litigation issues. In fact, a portfolio that goes long companies that have relatively few changes in their reports from period to period, and goes short stocks that have a high number of changes, outperforms by a substantial 188 basis points per month. American investors should therefore be happy that listed companies are still required to produce comprehensive quarterly reports while European regulators did away with this requirement in 2013.

Here is one example of how understanding context generates investment signals. An analysis of the quarterly reports of American companies over the last two decades shows that after controlling for a firm's size, valuation, and financial health, all else equal, the addition of the word "deficiency" in an ESG context, increases

the probability of stock underperformance by one per cent over the following three months. If the word "inconsistencies" is included, the probability is doubled, while the word "obstacles" indicates the probability of stock underperformance will almost double again.

Of course, as companies become wise to these types of analyses, they may merely adjust the language they use in their reports. Our analysis shows that data vendors that provide ESG ratings of companies tend to rate them more highly when the company uses positive sentiment terms in their language. In addition, the rating also tends to rise as the length of the sustainability report increases.

Hence, many companies have been accused of 'green washing' their sustainability reports (see the article "New ways to catch greenwashers" for a deeper discussion). This is why it is necessary for the α -Dig system to use Natural Language Processing to learn to infer context. This allows it to classify various arrangements of text included in company filings into the appropriate ESG bucket that investors can use when screening or ranking stocks for a portfolio. The tool also identifies new text and infers the context to decide how meaningful it is.

Even investors who consider themselves well informed should take note. Partly, this is because the press is yet to jump aboard the ESG train. Our analysis of 100,000 financial news articles shows that just two per cent relate to corporate ESG issues. In contrast, over half are earnings related, about a fifth discuss corporate actions, such as mergers and acquisitions, while the rest relate to company press releases and analyst recommendations. So without the press as a guide, investors are left to peruse company disclosures by themselves.

Anyone who has read through an official company disclosure, such as an annual report or 10K form, knows how difficult it is to sort the useful information from the marketing puff. For this reason it is understandable that many investors either overlook company-disclosed ESG information or, if they see it, they are bad at transforming it into a well-timed market trade.

This problem has been amplified by the exponential increase in the amount of data available. This data explosion comes not just from the growing number of news sources, but also from disclosures from firms themselves. Consider that four-fifths of American companies now publish reports on corporate social responsibility topics. That is quadruple the proportion that published just seven years ago. Furthermore, an analysis of the amount of data reported to the Securities and Exchange Commission shows this has increased five-fold since the financial crisis.

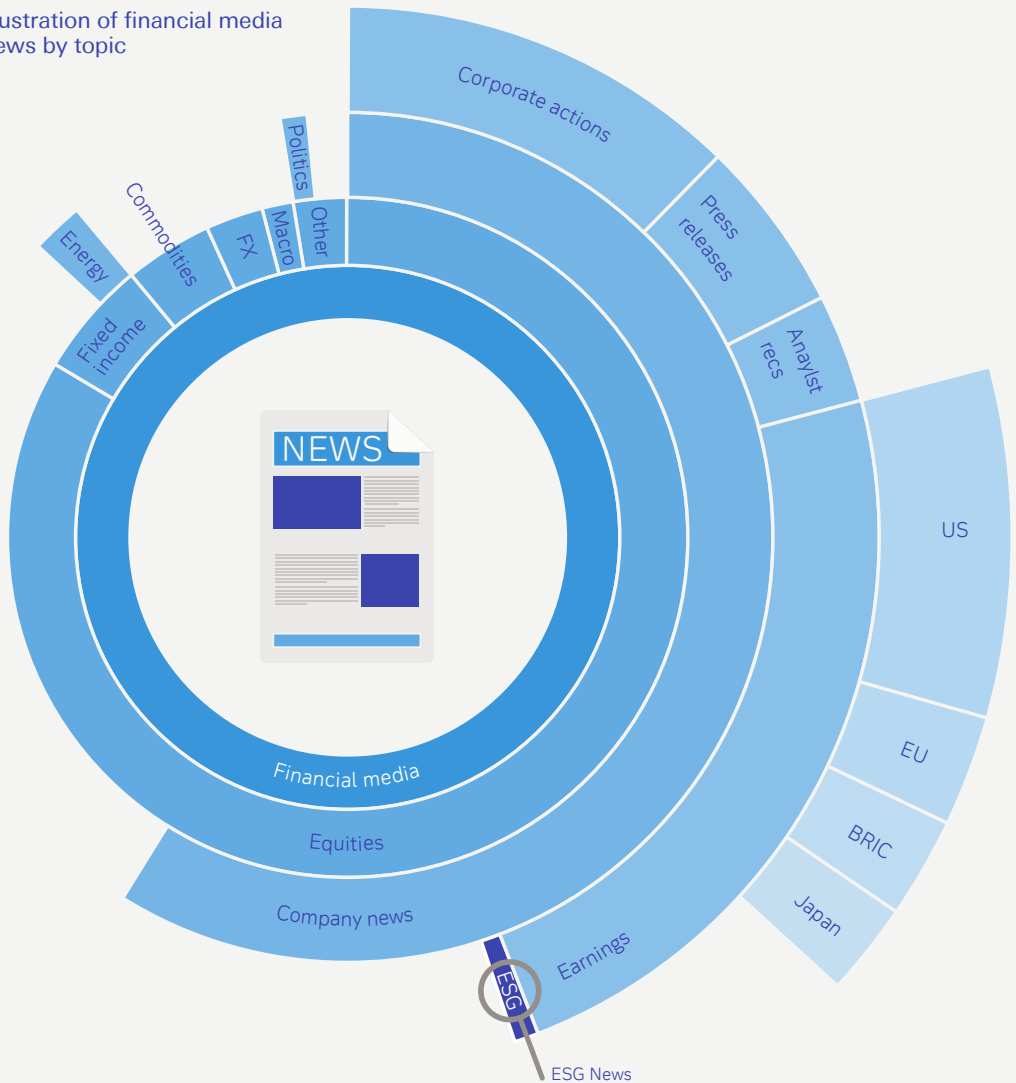
ESG news bias

In today's world of big data, we question the assumption that investors are aware of all public data.

When we analysed a sample of 100,000 financial news articles we found the majority was 'hard' accounting-related news. Only two per cent was ESG-related.

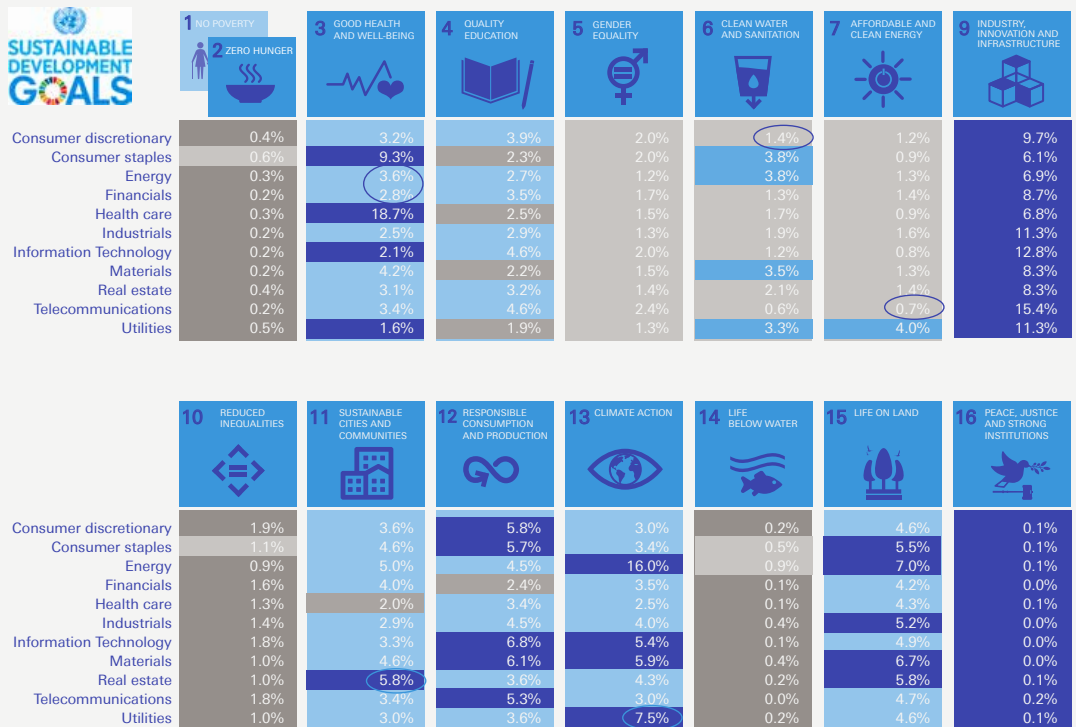
Implication:
Investors can easily overlook intangible information.

Illustration of financial media news by topic



Corporate sustainability reports contain some good non-financial data but it can be difficult to find

Proportion of text in corporate sustainability reports associated with sustainability and development goal topics

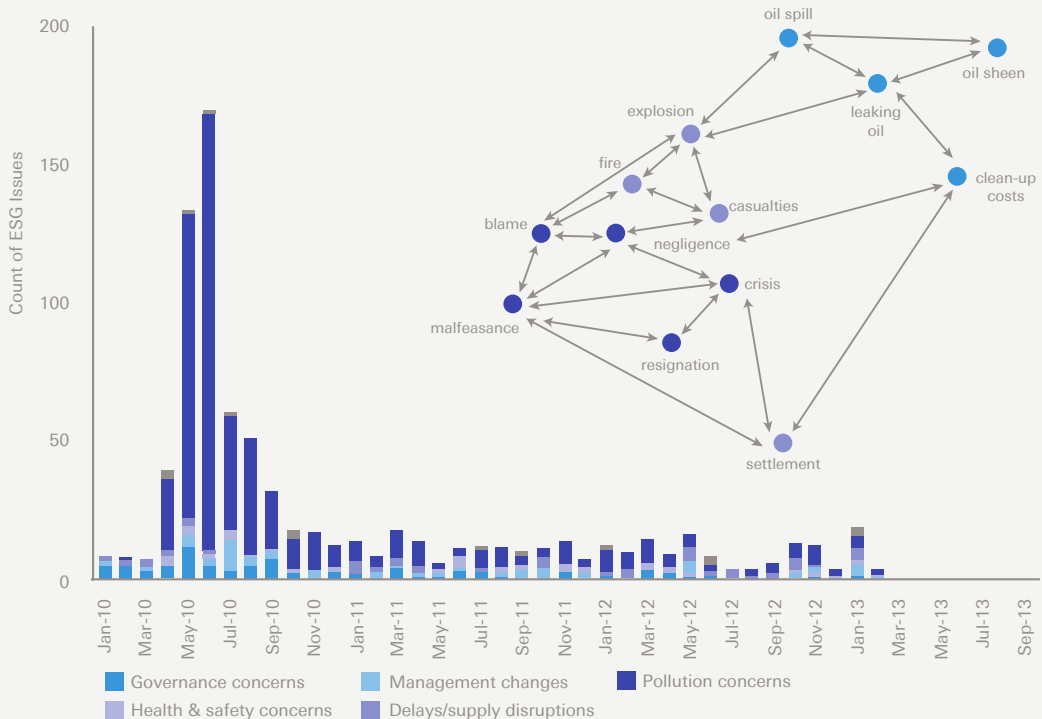


Artificial intelligence learns the dependency between ESG news stories to avoid over- or under-focus on one event

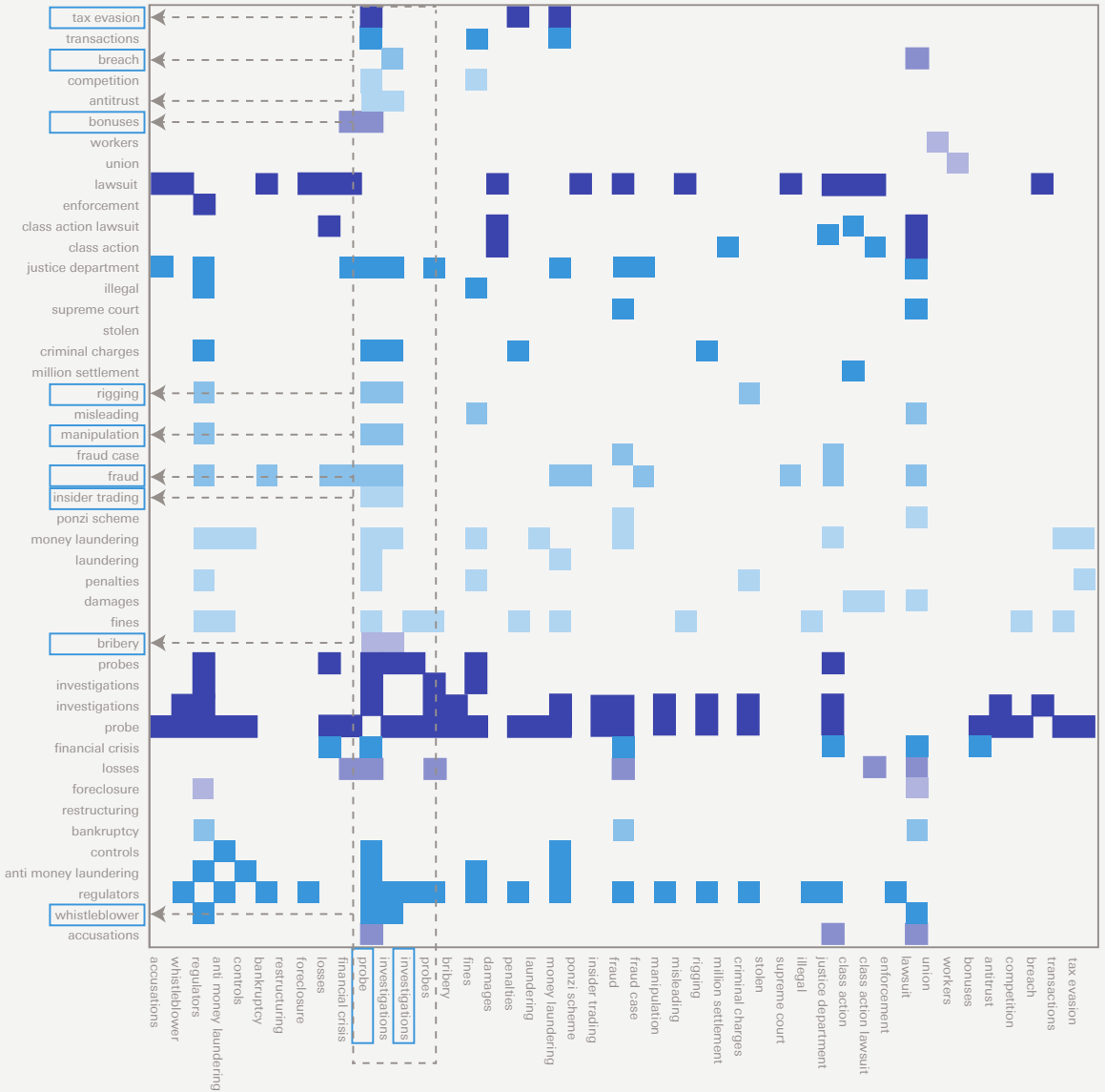
Selection of ESG news articles on the Deepwater Horizon oil spill in 2010

Date	News Headline
20100421	Transocean rig drilling for BP in US gulf hit by explosion
20100426	US Govt: Gulf Oil Spill 36 Miles To Shore
20100427	Senior House Democrats questioning whether BP and rig operator Transocean had an adequate emergency plan
20100505	Containment Dome Being Lowered Onto Main Oil Leak In US Gulf
20100531	White House Aims To Crack The Whip
20100607	No confirmation BP containment cap successful
20100623	NY State Pension Fund To Sue BP Over Investment Losses
20100715	Fears Mount Fund Won't Cover All Damages
20100720	BP CEO Hayward Preparing To Step Down: Sources-Report
20100916	EPA Launches Investigation Of BP Texas City Refinery
20101203	BP Says Spill Rate Was Lower Than US Estimates
20110817	Sheen Seen Emanating From BP Thunderhorse Platform In US Gulf
20110818	BP Reports Oil Sheen In Gulf Of Mexico
20110818	BP Clarifies Various Media Reports
20110831	Russian Officials Raid Moscow Office
20120608	BP Wants Settlement Below \$15 Billion on 2010 Oil Spill

Source: Dow Jones Newswires, Deutsche Bank



Machine learning generates data-driven materiality matrices, which outperform traditional keyword searches



Not only have the number of filings increased, but the size of individual filings have as well. The average number of words per quarterly SEC filing is now about 20,000, more than double the number two decades ago. Annual filings have grown to 50,000 words on average, with a growth rate just behind that of quarterly reports. Sifting through all that information is difficult. Just one example comes in the form of litigation disclosures. Our data show that although litigation and regulation are among the biggest risks a company faces, on average, an investor has to read through three-quarters of a company's 'risk factors' report before these are mentioned.

Investors may begin to feel faint at the thought of sifting through all this new data, especially if most automated filter systems are not advanced enough to reliably infer context. And as more and more ESG data become available, the risk grows that investors will end up as 'boiling frogs'. Already, ESG data tends to be released with a substantial time delay compared with 'hard' accounting data. Compounding this problem, studies show investors underreact to the drip feed of 'soft' negative news. And when they do react, the volatility created can catalyse even more uncertainty. For example, when BP experienced its Deepwater Horizon oil spill in 2010, investors reacted very quickly to the news feed, however, they clearly did not know how to determine the impact of the news on the value of BP's shares. Over the following 200 days, the stock price was between 303 and 648 pence.

One recent example of how α -Dig adds value can be seen in the analysis of Facebook's filing in February 2018. Amongst all the topics discussed in the 'risk factors' section of Facebook's filing, accounting-related topics involved the most negative sentiment, closely followed by the negative sentiment around products. Importantly, the system identified that the product-related negativity was not due to market share, which was surrounded by positive sentiment. Just a few months later, Facebook second-quarter results announcement came with warnings about margins and product-related growth. Its shares fell one-fifth resulting in the single biggest one-day drop in the value of an American stock.

Backtesting through the machine-learning algorithms shows that companies that discuss new problems typically see negative earnings surprises over the following quarter, even after controlling for analyst forecasts and prior events. The effects are more noticeable for small-cap companies with less sell-side analyst coverage.

It is true that investors are quick to latch onto certain non-financial information in company filings. This is particularly the case where potential litigation is involved. Indeed, our analysis

shows a stock price will react to new risks that involve the words "disputes", "arbitration", and "claimant". Yet, there is a much larger cluster of words which, even in context, appear to be overlooked by investors. These include, "breaking", "discrepancies", and "misjudge". Our regression analysis shows that these words suggest a future impact on a stock's market return yet investors clearly are unable to fully decipher their meaning at the time of disclosure.

Despite the emerging evidence provided by artificial intelligence, companies themselves struggle to understand the ESG environment that affects them. Our survey of 400 global companies shows that only seven per cent could quantify their sales exposure to the United Nation's sustainable development goals. Furthermore, only one-fifth of companies could even give a qualitative response. In fact, the vast majority of companies simply stated that they had no transparency.

This could be because companies are rather reluctant to give out information about themselves. Take, for example, the health care sector. Our analysis shows that only one-fifth of the average healthcare company's sustainability report is devoted to topics of good health and well-being. Similarly, just eight per cent of the average utility firm's report is devoted to climate action, while just six per cent of the average real estate company's report is devoted to issues facing sustainable cities. No wonder investors balk at sifting through pages of unhelpful data to try and uncover the few nuggets.

Finally, it is perhaps no surprise in our finding that the linguistic complexity of a company's filing matters and these stocks typically underperform, but it takes time for investors to fully digest the new information. Whether or not investors already know this is beside the point. If they do, then they will understand the need for sophisticated artificial intelligence to read the plethora of information available. Those investors who have previously dismissed tricky-to-read disclosures should look at the evidence that new technology has produced. The results of α -Dig show that ignoring the qualitative stuff is a big mistake but that to take advantage of it today, machine learning and artificial intelligence is required. ●

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The problem for investors is that, like litigation, most ESG events are very difficult to quantify and time.

ESG and big data – New ways to catch greenwashers

The term corporate social responsibility is a brilliant one: it means something, but not always the same thing, to everybody.

Votaw and Sethi (1973)

Forty five years on from the utterings of this quote, investors still grapple with the definition of terms like “corporate social responsibility” or “sustainability”. Annoyingly, this ambiguity hinders the ability of data vendors to measure a firm’s ESG metrics. No wonder existing metrics are often criticized for lacking sufficient depth and containing substantial measurement errors—comprehensiveness is in the eye of the beholder.

One casualty of this ambiguity is credibility: many investors question a firm’s motives for publishing sustainability reports. They worry that some ESG reports are ‘green-washed’, that is, they are written by a company’s marketing or public relations department and contain sweeping statements designed to enhance the company’s reputation without enhancing accountability to investors.

Yet, green-washing is not binary; it exists on a spectrum, and some examples are clearly more egregious than others. So how are investors supposed to respond? One way is to find alternative sources of data that go beyond company policy scores and infer corporate behaviour, the premise being that a company’s ‘actions speak louder than words’.

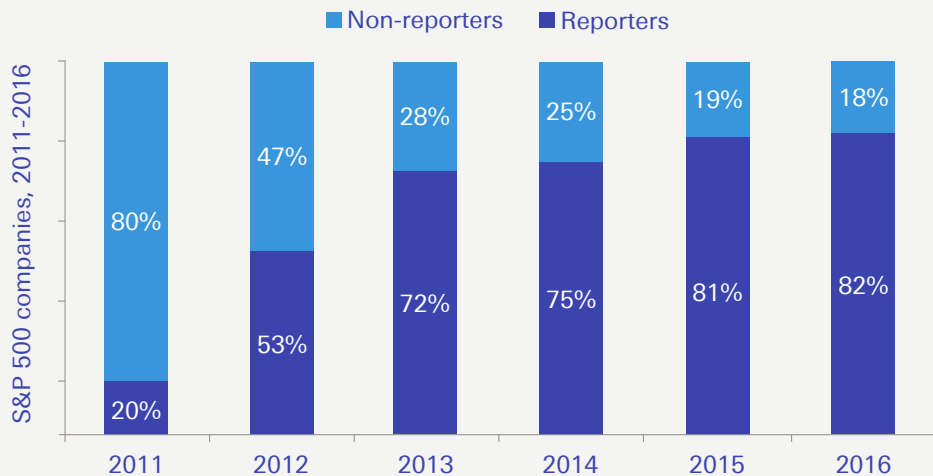
Given the ballooning amount of non-financial data and information available, that analysis can only be reliably carried out with artificial intelligence. That is the point of Deutsche Bank’s α -Dig system. This uses machine learning algorithms and natural language processing techniques to infer context and understanding from company information that is increasingly subject to green-washing (see our article “Investing with α -Dig” for a deeper discussion of the performance of α -Dig’s artificial intelligence).



The key to deriving the impact on a stock’s fair value from the imperfect messenger of a green-washed report is to understand how traditional ESG ranking systems have become outdated. Ten years ago, ESG scores from data vendors consisted of little more than ‘yes’ or ‘no’ responses to questions based on whether companies had particular systems, controls and policies in place, such as those to mitigate cluster munitions, bribery and corruption, or child labour. These scores allowed investors to build the exclusion lists desired by their clients. Yet, in an age of merely voluntary corporate sustainability reporting, data vendors, understandably, relied upon the limited datasets that were available in company reports; there was little in the way of an alternative.

Andy Moniz, Spyros Mesomeris

Percentage of companies in the S&P 500 over time that published sustainability reports



Source: Governance & Accountability Institute, Inc. 2017 Research.

As the above chart shows, corporate sustainability reporting has jumped since the financial crisis. This new information has allowed vendors to refine their dataset definitions and add many more ESG scores.

Many traditional ESG rating systems have been overwhelmed with all this new information. Indeed, there can be upwards of 300 ESG data points for a single company and there is little consensus across data vendors as to the definition of sustainability or materiality. Worse still, in some ways, the expanding amount of information has enabled some firms to game the ratings system by publishing more metrics regardless of their quality. In these cases, the goal is to influence investor perceptions of corporate transparency – green-washing.

To uncover the potential flaws in traditional ESG datasets, we conducted a series of tests with the α-Dig system. The first of these examined ‘agenda-setting,’ or the potential biases in company sustainability reports. This is based upon the view that corporate communications typically frame information to influence the issues investors think about.

Once trained, our machine-learning algorithm read reports from over 1,000 organisations and tagged sentences to different topics, such as general overview, earnings-related, sustainability-related and so on. For each

report, our algorithm identified the percentage of text associated with different sustainability topics as defined by the United Nations 17 Sustainable Development Goals that include combating climate change, and protecting oceans and forests, making cities more sustainable, improving health and education, and ending poverty and hunger.

The table on the pull-out pages shows the percentage of text discussed for each sustainability topic averaged across different sectors.

The first striking observation is that the percentages highlighted in this table are all very low; the rows in the table sum to substantially less than 100 per cent. That highlights just how much of the text in company reports cannot be clearly assigned to any particular topic. Essentially, this is superfluous, marketing information or green-washing. Our second observation is that companies typically devote most of their time to discussing how innovative they perceive themselves to be rather than actually talking about sustainability issues.

Against the backdrop of these biases, other findings are more intuitive. Utility firms talk most about climate action and clean energy, healthcare companies discuss health and well-being, while real estate groups predominantly discuss sustainable cities.

We next conducted a more direct test of corporate green-washing. This involved testing the extent to which the ESG ratings provided by one leading data vendor were explainable using only the information published in a company's sustainability report. In other words, was the data vendor influenced by the information published in reports?

To do this, our algorithms had to be trained to understand a variety of commonly used linguistic measures that humans find easy to distinguish but that traditional machines find impossible. This threw up some unexpected results and made it apparent that a firm can influence its ESG policy score by green-washing its sustainability report. The following details the specific impact in various green-washing categories.

Financial metrics – larger-cap companies tended to receive higher ESG ratings. Specifically, for every additional \$1bn of market capitalisation, we found a 3.5 point increase in a company's average ESG rating. One explanation is that large firms have greater resources to dedicate to sustainability departments and to write long reports.

Document length – Up to a certain point, a longer document indicates greater transparency. Past a hard-to define point, longer documents indicate verbosity. On average, for every additional page of text, we find a 0.25 point increase in a company's data vendor rating. In other words, companies appear to be rewarded for being verbose.

Lexical diversity – this is the number of unique words used in the text captures for the richness of language express in the text. The premise being that a richer variety of language maybe more indicative of marketing creativity and green-washing.

Sentiment – this is the proportion of positive keywords in the text and is designed to capture excessive optimism. We found this measure to be highly significant. In other words, companies that use optimistic language including mentions of "awards" and "accomplishments" typically receive the highest ESG ratings.

Goals – this is defined as the count of mentions of "goals" and "targets" written in the text. The idea is to capture quantitative information and evidence of sustainability behaviour. For every additional mention of goals, we found a one point increase in a company's average ESG rating.

The most important test is to investigate the relationship between what companies say in their sustainability reports and their future realised sustainability performance. In particular, we examined whether the commitments firms make to reducing carbon emissions were associated with actual lower 'scope one' carbon footprints (see our article "Sorting the muckle from the muckle" that discusses 'scope one two and three' emissions in more detail).

We trained α -Dig's NLP algorithm to assess company commitments and detect carbon-related discussions in sustainability reports. The result was the identification of five different

footprint	mitigation	adaptation	monitoring	risks
emissions	processes	systems	monitoring	risks
impacts	responses	adaptation	usage	regulatory
ocean	plans	goal	volume	reporting
climates	requirements	thresholds	percentile	policymakers
ecosystems	reported	technology	stabilizing	trends
society	estimates	operational	target	economic
reef	measures	achieving	consumption	shifts
glacier	mitigation	improvements	percent	effects
forest	research	target	capacity	changing

topics. The adjacent table shows the top keywords associated with each topic.

Some companies talked about their carbon footprint (stating their emissions or impact) while others discussed their plans to how mitigate or adapt to climate change.

We then created a ranking system to identify which companies are most focused on climate mitigation and adaptation. We then combined these rankings with other linguistic features extracted from sustainability reports. For example, to capture quantitative insights, we computed the ratio of Arabic numerals and quantitative words, such as “first”, “second”, and “half”, and then calculated the number as a proportion of the total number of words, the idea being that numeric disclosures are more likely to represent evidence of a commitment to decarbonisation. We also included a measure of active versus passive language used in the disclosures. The premise was based on the SEC’s linguistic guidelines which state that company communications are required to: “Substantially comply with these plain English principles: short sentences; definite, concrete everyday language; active voice; tabular presentation of complex information; no legal jargon; and no multiple negatives”.

Finally, we supplemented our linguistic measures with environmental scores published by an ESG data vendor. The vendor distinguishes between companies’ energy reduction policy commitments, objectives and targets, and initiatives to improve its environmental footprint.

We could then make a prediction of the likelihood that a company would cut its carbon emissions in the next year given the stated policies, objectives, and initiatives discussed in its prior year’s sustainability report.

The results were unambiguous. The ESG scores computed by traditional data vendors were all statistically insignificant. In other words, when a company discusses its environmental policies, objectives, and initiatives, it does not lead to a reduction in its future ‘scope one’ emissions.

Now for some good news – our linguistic measures are statistically significant. That means companies that use highly active and numeric language have, on average, a 74 per cent chance of reducing their future emissions. In comparison, companies that frequently discuss mitigating or adapting to climate change have a 65 per cent higher probability.

Perhaps the biggest takeaway from the α-Dig artificial intelligence system is that the ESG data landscape has been ripe for disruption for some time. Now that the technology is

sophisticated enough, corporate green-washing can be exposed and big data techniques can be used to predict company behaviour and better examine corporate goals.

It is a shame that many companies green-wash their communications, especially as this influences the ESG scores calculated by traditional data vendors. But investors, in combination with new technology can begin to uncover the reality of a firm’s ESG position and help model many ESG investors’ ultimate goal: to predict the carbon transition risk and a company’s future carbon footprint. ●

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ESG and international development – A necessity, not a luxury

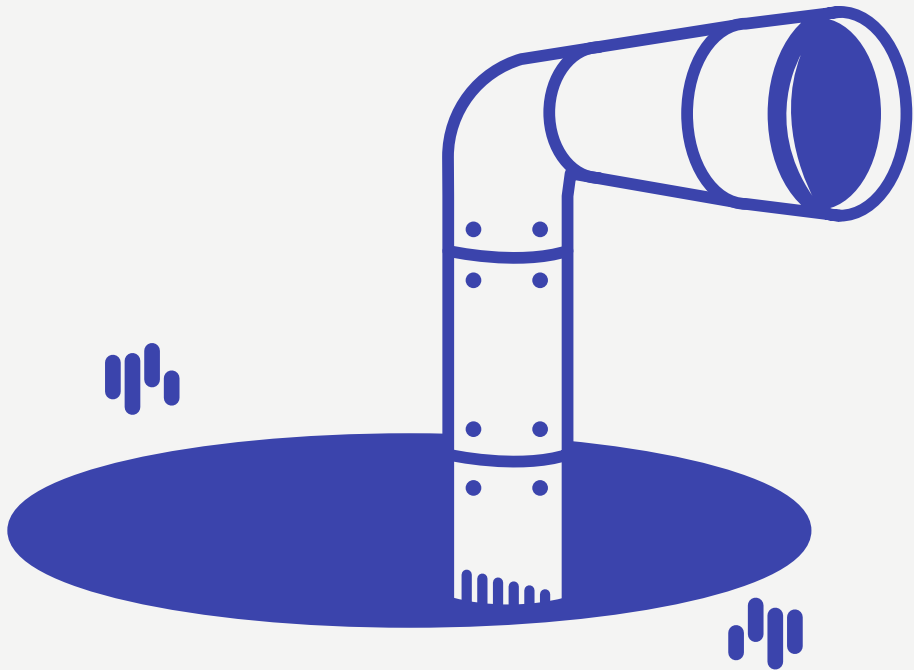
The push for responsible investment standards gained steam during the last three decades, which were generally the years of multilateral engagement and internationalism. Even during this supposedly halcyon period, though, some persisted in seeing the development of environmental, social and governance standards (ESG) as a luxury of developed economies. They argue that only once an economy has spent sufficient time in the trenches of economic development can it afford to turn its attention to nice-to-have ESG protocols.

At some level, this argument has merit. There are plenty of examples through history of countries exploiting natural resources and polluting their environment for economic gain only to clean up their act after progress is made. The famous “London fogs” from polluting factories and homes was a tolerated outcome of the policy mix that enriched Britain through the Industrial Revolution and well into the 20th century. Apparently, only once those economic benefits were captured did Britons decide to clean up the mess.

Today, there are plenty of studies that show the long-term economic consequences of plundering the environment. The World Health Organisation recently calculated that the economic cost due to premature death and disability from air pollution in Europe is close to \$1.6tn, or a little under one-tenth of the output for the entire European Union.¹ In the same vein, a study in the Lancet estimated that air, water, and workplace-related pollution are linked to nine million deaths each year worldwide, or about one in six of all deaths.² Taking a historical view, anthropologist Jared Diamond has described how unsustainable environmental policies have led to the collapse of entire civilisations.

But ESG is about far more than the environment. Indeed, this piece will focus on the social and governance issues that have typically been less prominent. Specifically, we will argue that there is evidence that robust standards for these two categories are not a luxury that an economy should pursue only after attaining a certain standard of development. Rather, they are a prerequisite for sustained growth in the short term and beyond.

Jim Reid, Luke Templeman, Sahil Mahtani



If we briefly drill down to the company level, it seems that investors have preferred stocks with good ESG ratings for some time. Our analysis shows that large European companies with the best ESG ratings (see the article “ESG: a guide for fund managers” for a discussion of our rating methodology) have outperformed the market since at least 2005, which is when the best data is available. In fact, the top two quintiles, based on their ESG ratings, generated average returns of 75 per cent, more than triple the return of the bottom two quintiles.

Disaggregating these numbers, it is clear that outperformance is concentrated in upwards economic cycles while in economic downturns there is less obvious correlation. In other words, during an economic downturn, investors sell off stocks irrespective of their ESG status while during an upswing, they prefer quality ESG stocks.

Translating the argument from a corporate level to a country level is never straightforward but it is clear there is a link. In fact, to suggest the opposite—that promotion of the rule of law, a culture of anti-corruption, anti-bribery and strong intellectual property rights can be achieved without corporate participation—seems quixotic.

An influential recent study by Acemoglu and Robinson seems to support this point.³ They

differentiate between inclusive state institutions—that establish the rule of law and private property, while setting a level-playing field for the provision of services—and extractive institutions, where the economic structure is organised to supply elites with resources from the rest of society. The study concludes that extractive political institutions are unsustainable in the long run.

This is just one reason why development economists should focus more on corporations and how their ESG issues might affect national outcomes. In addition to the long-term linkages, there also needs to be a focus on how the social and governance policies in an economy affect its ability to produce more goods and services—the key driver of near-term economic growth. In this regard, we will briefly discuss three social issues and three governance issues to which economists should pay more attention as they have direct, short-term effects on an economy’s growth potential.

Social issues

The first issue is that of workforce diversity as there is a clear link between encouraging women and minorities into the workforce and the quality of economic growth that a country can sustain. At a fundamental level, an economy is

constrained by the size of its workforce, so a large number of high-quality workers is preferable to a low number. Yet many policies in developing countries prove to be barriers to maximising that number. In many low-income countries, young women are more likely to be neither engaged in paid work nor in education than young men.⁴ The consequences are significant. A World Bank report found that, globally, countries lose \$160tn in wealth because of differences in lifetime earnings between women and men.⁵ And because women earn less than men, human capital wealth worldwide is estimated to be one-fifth lower than its potential level. Involving a diverse workforce in corporate life, far from being a trendy luxury, is crucial to creating the positive feedback loop that encourages high educational attainment standards for all kinds of graduates.

It is not just developing economies that need to take note. Many developed countries face shrinking workforces in the near future. Indeed, the average size of an American family has fallen from 3.7 in the 1960s to 3.1 today. One study suggested that up to one-fifth of US economic growth from 1960 up to the financial crisis could be related to growth in previously underrepresented groups in the workforce, particularly women.⁶ That result can be seen against the backdrop of an increase in the female participate rate from 35 per cent in the 1950s to 60 per cent in 2000. Yet since then, the trend has reversed and participation has fallen to 57 per cent. That compares with the 68 per cent

participation rate for men, which is, in any case, lower than many comparable OECD countries. Clearly, more can be done here.

Japan is a country that has done much in recent years to make the most of its human capital, unsurprising given the torrid demographic pressures at work there. Since Prime Minister Abe came to power, for instance, the female employment rate has risen to nearly 70 per cent from just 64 per cent. Yet what government policy pushed for, asset managers could have pre-empted or encouraged via ESG policy—politics and business are merely handmaidens to the same goals.

Closely linked with labour force participation is education. A UN report estimated that increased educational attainment accounted for half of the economic growth in OECD countries over the past 50 years.⁷ Of this, over half is due to girls having had access to higher levels of education and achieving greater equality in the number of years spent in education between men and women. More specifically, the OECD found that one extra year of education corresponds with a rise in human capital of 11 per cent and leads to an average increase in output per capita of nine per cent.⁸

The next social issue that directly affects both the size and quality of a workforce is its health. Our focus is on workplace health and safety. It is true that some observers argue that developing countries can only become wealthy by first using their cheap, less-regulated workforce.

However, there is strong evidence that this notion is over-simplistic. First, a European Union report found that work-related injuries cost the continent almost €500bn a year. Worldwide, work-related injury and illness reduces economic output by 3.9 per cent, or an annual cost of €2.7tn.⁹

As to the notion that the cost of health and safety regulations decreases economic output, a British government report suggested that while greater stringency in this regard may lead to a short-term fall in output, over the long-term, productivity increases.¹⁰ Taking this to its logical conclusion, not only do health and safety laws boost the size and quality of an economy's workforce, they decrease the need for family carers and also result in lower medical bills.

The same interplay between short-term and long-term issues occurs with bribery and corruption. It is true these are more common in low-income countries. Yet, some argue that many societies in these countries have adjusted to view bribery as a mere part of daily life, or a cost of business. They may also argue that corruption is a consequence of poverty, not a cause and thus only when a country becomes economically richer will bribery cease.

These are flawed arguments. In an economic system, bribes entrench the position of the incumbents that can afford to pay them. This curtails the incentive for people to start new businesses. It also leads to waste through the sub-optimal allocation of resources. The World Economic Forum estimates that corruption

increases the cost of doing business by up to ten per cent on average. In 2002, the African Union estimated that one-quarter of the economic output of African states, or about \$150bn, was lost to corruption every year.¹¹ It is no surprise that the average per capita income of the ten countries perceived to have the least corruption is \$62,000, ten times higher than the average of the ten countries with the most corruption. And if the outlier of Equatorial Guinea is excluded, the least-corrupt countries would be twenty times richer than the most corrupt.

Governance issues

We now address three governance issues that have pressing, short-term implications for economies. The theme that ties them together is that they offer useful incentives to corporations.

The first concerns corporate governance structures. It is true that company governance rules are highly specific and depend upon the rules in individual countries. As the minutiae of the differences between these laws goes far beyond our discussion here, we will side with an older but highly-cited study from the Wharton school that takes a step back and looks at companies with a "weaker" governance structure which leads to greater agency problems. This study found that chief executives at these firms receive higher pay than their counterparts at firms with "better" governance structures.¹² It also found that firms with highly-paid chief executives and weak governance structures deliver poor

performance to their investors. In fact, a 40 per cent increase in a chief executive's excess compensation leads to a decrease in return on assets of one percentage point. So, a firm with return on assets of ten per cent will see that fall by one-tenth.

In this regard, checks and balances have an important and direct impact. Just one observation is that the existence of an internal board member (aside from the chief executive) who owns at least five per cent of the company's shares is associated with lower compensation for the chief executive.

The next issue is ESG transparency. A quick look through the average company's annual report shows dozens of pages devoted to these disclosures. These pages tend to be littered with buzz-words and investors tend to be sceptical about their usefulness (see our cover story "Investing with Alpha-Dig" for a discussion of just how useful these reports can be). A global study by the University of London, Birkbeck, found that the benefits of ESG disclosure outweigh the costs for the average listed firm. Indeed, greater ESG disclosure boosts a firm's valuation, in particular its Tobin's quotient—a measure of the market value divided by the replacement value of a firm's assets—as investors gain greater clarity about intangible assets. Other research found that firms with better ESG transparency can lower their cost of capital because of lower operational and reputational risk.

Importantly, this applies to both developed and developing countries. One study focussing on Chinese firms showed that those with higher scores for corporate social responsibility had a significantly lower cost of equity capital and that this effect was more pronounced in economic downturns that upswings.¹³

Finally, an unheralded governance issue is an economy's adherence to globally-accepted accounting standards. The International Accounting Standards Board counts 144 jurisdictions that have adopted international standards. A further 12 have made a commitment to a single set of accounts. Another ten have peculiarities that make them averse to international norms, such as Switzerland and Bermuda which choose to retain a high level of local control over their financial institutions. When we examine the remaining 45 or so countries, we find this group generates just 1.2

per cent of the world's economic output even though the group comprises almost one-quarter of the world's countries.

To wrap up, we have shown that the impact of ESG issues on economies should not be limited to environmental issues. Rather, social and governance issues as reflected in corporate activity can have a significant, short-term impact on an economy. The focus on these issues is likely to increase as despite the recent movement towards populist policies in some developed countries, there is a growing chorus of local voices demanding that ESG issues be further integrated into the policymaking. This is not only good social policy, but is also good for cold, hard economic reasons. ●

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Involving a diverse workforce in corporate life, far from being a trendy luxury, is crucial to creating the positive feedback loop that encourages high educational attainment standards for all kinds of graduates.

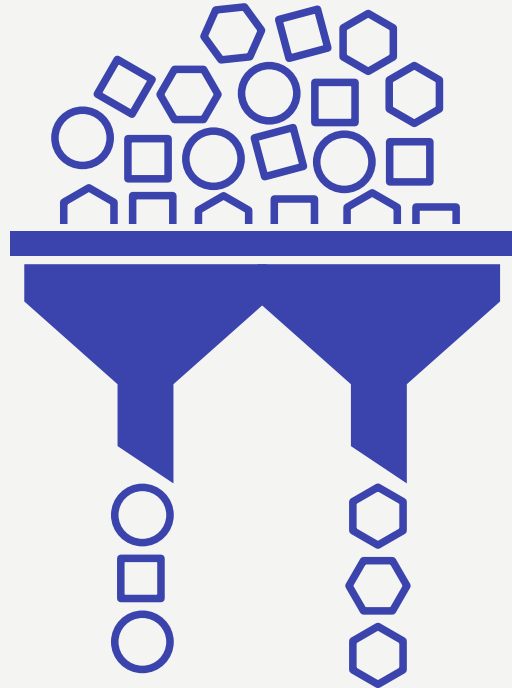
Scope three emissions – Sorting the mickle from the muckle

Brought up in Scotland, I'm long-versed in the need to look after the pennies (mickle) so that the pounds (muckle) can take care of themselves. The same thing applies with the drive to force corporate disclosure of emissions, one of the most critical parts of the energy-transition process.

In this case, the mickle comprises 'scope one and two' emission disclosures. Scope one refers to those emissions that come only from a company's owned or controlled source: the trucks that drive around a copper mine, the emissions from a directly-owned power station, or the methane leakage at a gas production or pipeline site. Scope two covers gases emitted in the production of electricity, steam, heating or cooling that a company purchases and consumes to produce its goods. So, a power generator's emissions are its own scope one, but another's scope two.

Scope one and two emissions are deemed to be those over which management has most control, and should be expected to reduce. Preferably, these should be made the object of board performance criteria. We see many companies responding to this challenge through a combination of specific targets, the application of internal carbon pricing, and the direct contracting of renewable power sources.

Now for the muckle: scope three emissions. These include all those that occur within a company's range of operations: its true carbon value chain. They divide into upstream (generally dominated by those embedded in purchased goods and services) and downstream emissions (usually focused on the use of sold products).



Comparing comprehensive scope three emission data is one of the holy grails for ESG investors. Yet while not all companies disclose this information, investors must resist the temptation to use scope one and two data inappropriately. It is perhaps easiest to illustrate this with an example:

What are the carbon emissions of Apple, the world's biggest listed company? Even though Apple is one of the world leaders in disclosing its carbon footprint, the question is more difficult to answer than it seems. To start with, Apple's annual report says it was responsible for just 89,000 tonnes of carbon dioxide equivalent emissions in 2017. That is an impressively low figure for a company of its size. Compare that with rival Samsung, which has about the same level of sales as Apple. Its emissions sit at 13m tonnes, about 150 times more than its Californian peer. The obvious conclusion is that Apple is far more environmentally friendly than Samsung.

There is more to the picture. These emissions above are scope one and two emissions. To calculate scope three emissions, Apple has analysed its supply chain. The result provides a stark illustration of the limited usefulness of scope one and two figures. Indeed, Apple's scope three footprint last year was over 300 times larger than its scope one and two

Caroline Cook

amounts. The investment message from comparing Samsung and Apple's scope one and two emissions? Approximately zero.

Partly, the reason for the enormous jump in emissions in Apple's supply chain versus its immediate operations lies with the large volume of outsourced manufacturing done in China. In contrast, Samsung conducts far more of its production in-house, so the jump in emissions to scope three levels is likely to be far lower than that for Apple.

As a way to reduce scope three emissions, Apple is requiring its suppliers to invest in new technologies to cut carbon intensity. It is also supporting start-ups that focus on research and development in this area. And this corporate focus is having a wider impact. The types of external pressures created by Apple and others are adding to the strategic imperative behind the so-called Blue Sky Strategy of the Chinese government: it is not just about clean air, it is about retaining long term competitive advantage.

Despite the obvious problems with scope one and two emissions data, too many ESG investors still use them in their investment process. This blunt instrument of analysis can cause unintended consequences, particularly when companies are ranked, and portfolios benchmarked, on their reported emissions of carbon dioxide per unit of sales or market value. These measures tell us little about the potential value, risks, and opportunities of the stock in a lower-carbon world. Furthermore, they bear little correlation to the full carbon footprint of a product or service, and tell us nothing about the likely impact on associated prices, demand patterns and margins. At worst, they can lead to the outright misallocation of capital when

companies offering genuine solutions for the energy transition find themselves on the wrong side of the benchmarks.

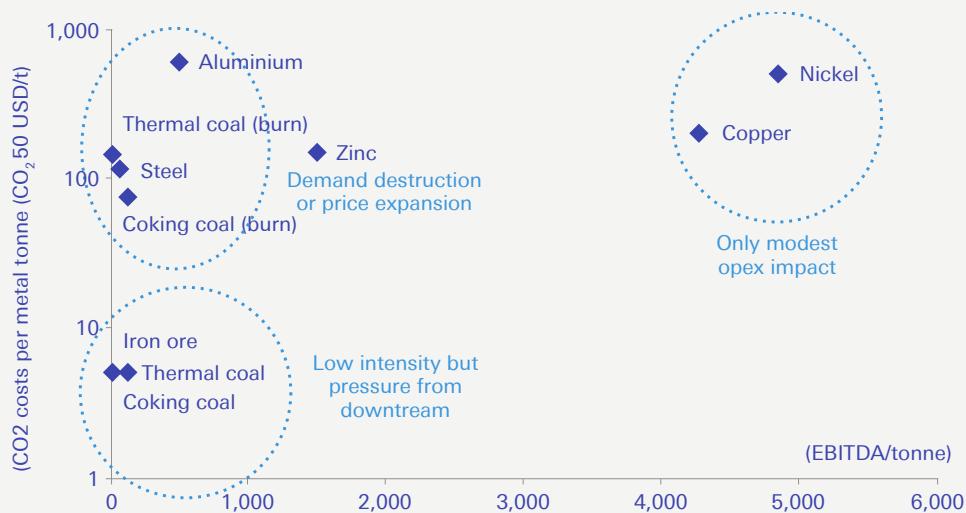
To make matters worse, even when scope one and two emissions data are available, they are not always comparable to each other. Sometimes companies report only those emissions from directly operated facilities, and exclude those from partnership operations – even when their financial accounts don't make the same distinction.

Ultimately, the problem for equity investors is that the value of a stock and the volume of emissions rarely align. Reconciling value and volume is the point of DeCAF: the Deutsche Carbon Alignment Framework. This is a structured framework that examines the interaction of policy, technology, and equity valuation across the green and incumbent sectors to estimate the impact on fair value. The analysis follows the life-cycle trail of carbon emissions, understands the potential for substitution, and evaluates the impact on margin and returns.

Sometimes, the misalignment between equity value and carbon volume can clash with policy efforts to limit global warming. The latter are necessarily focused on volume: we want fewer carbon dioxide emissions, coal-fired power plants and combustion-engines, more solar panels, electric vehicles and rain forests.

Yet, industries such as power generation, iron and steel or cement, where at least three-quarters of the emissions are scope one and two are the anomaly, not the norm. From oil and gas to chemicals, pharmaceuticals or even grocery stores, this proportion is more than inverted. To understand the market impacts and opportunities for these sectors, an investor must identify the

The misalignment of profitability and emission volume



Source: Deutsche Bank

carbon “hotspots” in the supply chain and consider the potential for carbon substitution. In addition, they must note the likely demand elasticities as carbon costs work through prices and volumes to new margin structures.

We are still in the early phase of corporate reporting on scope three emissions and only a handful of leaders across various sectors detail these. Most notably, it requires time-consuming engagement with suppliers and distributors, but if the underlying premise of energy transition is accurate, it is the only way to evaluate the likely outcome for costs and prices – and thus equity returns.

Emissions analysis in practice: Case one – metals and mining

In April, we published an in-depth look at the potential impacts of rising carbon costs in the metals and mining sector, with a particular focus on aluminium, copper and steel (*Mining DeCAF: green winners from black costs in a decarbonising world*). Depending on where you draw the line, the sector is responsible for 2 per cent (extraction), 11 per cent (including refining) or 37 per cent (including combustion) of global greenhouse gas emissions. Wide variations in power source (renewable versus coal or gas), unit margins, and future demand outlooks imply very different outcomes across different producers.

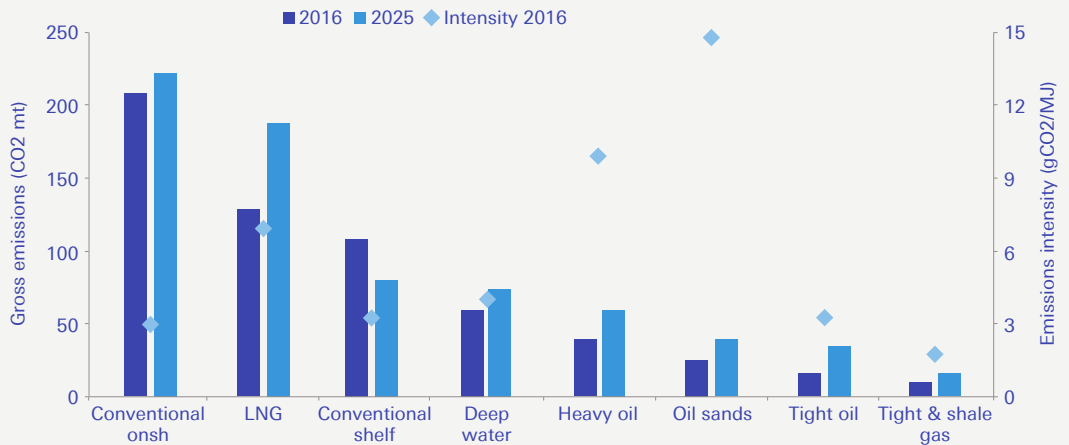
There are three potential outcomes as summarised in the chart above: successful price expansion, demand destruction or limited price pressure on operating expenditure.

As energy transitions, four ways to view this arise. The first is the outlook for product demand, for example, society will need aluminium but not coal. Second, there is the relative relationship between carbon intensity and product margin – high carbon costs and low margins are a red flag. Next is the potential for companies to reduce intensity, something that is easier for power in aluminium than refining in iron ore. Finally, there is the likelihood of accessing premium prices in the near-term as consumers look to buy ‘green’ product. By following the logic of each of these four analyses, we can discriminate across aluminium and copper firms.

Emissions analysis in practice: Case two – oil and gas

Emissions in the oil and gas sector are split with around 15 per cent being related to production activities (scope one and two) and 85 per cent generated by end-user combustion (scope three). There is reasonable disclosure across the mainstream companies, and a fair few do disclose scope three emissions. For those that do not, it is hardly rocket science for the external observer to figure them out.

Upstream oil and gas: carbon intensity by asset type



Source: Deutsche Bank

At the scope one and two level, it is becoming increasingly apparent that different companies' oil, gas, and refining assets have a very different carbon footprint. That means both investors and consumers could make a choice about taking their fuels from higher or lower carbon intensive sources. From a carbon perspective, oil and gas are not as fungible as they seem. As shown in the above chart, a barrel from oil sands reaches a refinery having emitted almost five times as much carbon as one from a more conventional source. Similarly, there are variations between liquefied natural gas and conventional gas (two to five times as much). Variance also exist in refining and distribution assets, but the data here is still very closely guarded.

Things are yet more complicated as significant differences arise within each field type across the world. The flip side of these complications is that it shines a light on the significant opportunities that exist for companies to both tighten operating procedures and wind down high-emitting assets. As better data is made available to ESG investors, they will push companies to take advantage of these opportunities.

A number of companies are now using internal carbon pricing to challenge procedures and products within their operations, though none have really come forward with an analysis

of the impact that a rising cost of carbon could have on overall demand. It may require assumptions about the long term strategies of the sovereign producers (Opec for oil, Qatar and Russia for gas), but few are better placed to give a view than those embedded in the market.

Other data will surely follow. Top of the wish-list for oil investors is an analysis of the sensitivity of asset values (rather than earnings) relative to price, as well as an indication of the payback period for new investments.

So while not all companies disclose scope three information, investors must resist the temptation to use scope one and two data inappropriately. They are not short-hand for carbon value exposure and using them in the investment process will only result in inappropriate capital allocation. Instead, investors should press companies to reveal their 'scope three' emissions and their full carbon footprint. These numbers are way more complicated, but way more useful. ●

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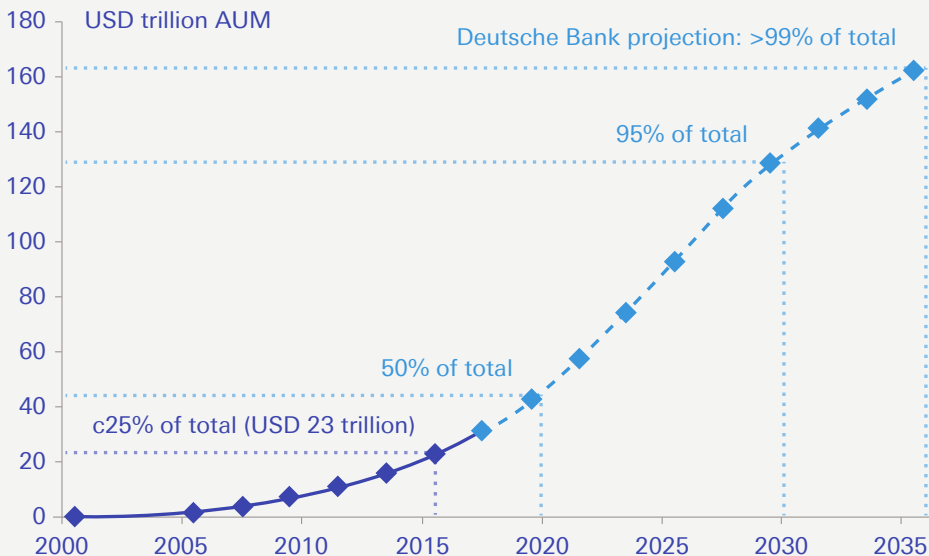
Equities – How fund managers can use ESG to assess fair value

It seems odd that nine out of ten of the world's largest fund managers are signed up to the United Nations' Principles for Responsible Investment, and yet only two-fifths admit they systematically consider environmental, social, and governance factors when assessing a stock's fair value.

That gap surely is going to close. Already, about one-quarter of global assets under management are governed by an ESG mandate. Given current growth rates, 95 per cent of assets under management, or \$130tn, will have fallen under this umbrella by 2030.

As the growth in ESG investing balloons, investors are likely to become far more discriminating if the performance of ESG-compliant funds continues to be poor. The risk, then, is that underperformance from single ESG-related funds might spread to other mandates. Indeed, the average actively-managed ESG fund in Europe has underperformed its benchmark by 1.2 percentage points since the year 2000. Just 15 per cent have outperformed by more than one percentage point per annum. And that is before fees and other costs which drag the performance even lower.

Assets under management with an ESG mandate



Source: Deutsche Bank estimates, Global Sustainable Investment Alliance (GSIA)



It is no secret that the main problem fund managers encounter is how to estimate the impact of ESG issues on the fair value of the stocks in question. The most popular tool used is an exclusionary screen and may rule out, say, tobacco or weapons stocks. But these types of screens are very rigid and constrain a manager's options to allocate capital through an investment cycle. They also generally rely on backwards-looking indicators from data vendors. Furthermore, they have a large-cap bias as smaller stocks do not have the resources to make best-practice ESG disclosures.

Those investing in European stocks are particularly in need of a better ESG framework. Europe is home to over half the world's ESG-compliant assets under management, yet only 16 per cent of Europeans fund managers say they consider ESG factors "occasionally".

For a forward-looking perspective on ESG issues, Deutsche Bank has created a new approach to integrate ESG issues into the investment process by determining the fair value impact of the most important ESG issues that affect individual stocks. To do this, we establish a tagging structure for each stock that uses five sets of five talking points per E, S, and G category – 75 points in total. For each stock, we focus on up to three major talking points within each of the

E, S, and G categories for both risks and opportunities. That gives a maximum of 18 talking points per company.

While the words "risk" and "opportunity" are sometimes used interchangeably, we believe it is critical to distinguish between the two. A risk is a problem that is structural in nature and difficult to mitigate within a three year time horizon. In contrast, an opportunity is something where there is a deficiency but a swift fix is available that presents upside to fair value in the near term.

The most important step comes next. Each individual Deutsche Bank equity analyst gives a forward-looking view of the company's talking points and assesses the likelihood of an impact on fair value in both the short term (under three years) and further out.

The output of this bottom-up approach is that points can be allocated to both the risks and opportunities to build an overall profile for each company. The logical conclusion is that companies with a high proportion of opportunities, when compared with the total of risks plus opportunities, have strong potential to increase their fair value. In contrast, companies with a large number of risks, as a proportion of total risks plus opportunities, should warrant serious investigation by investors.

This framework can be applied to any stock, however, when we apply it specifically to the Eurostoxx 50 index, there are some unexpected findings. First, we can draw comfort that our ESG analysis makes intuitive sense when we look at how markets see the stocks from a valuation perspective. We then note that there appear to be some contrarian indicators in consensus recommendations where investors can take advantage.

For starters, if a stock has a lower number of ESG risks and opportunities, it is more likely to trade at a premium. Indeed, the lowest quintile trades at 19 times estimated earnings and almost four times book value. That compares with stocks that have the highest number of risks and opportunities which trade at just 11 times earnings and only just above their book value. In keeping with this trend, the stocks at the low end offer a dividend yield of just 2.8 per cent while the stocks at the high end pay 4.8 per cent.

Despite the significant disparity in the valuations of stocks as they move up and down the ESG risk and opportunity spectrum, at each end of the spectrum stocks have relatively similar consensus recommendations. Indeed, the stocks with the most, least, and average number of risks and opportunities are all rated somewhere between 'buy' and 'neutral'. In addition, the proportion of stocks across the spectrum that are rated as a 'strong buy' is consistently between 20 and 30 per cent.

If we drill down we can see that stocks with

a low number of ESG risks and opportunities are skewed towards being growth stocks (those with high and stable sales and earnings). In contrast, those stocks with a high number of ESG risks and opportunities tend to be value stocks (those that trade on low earnings multiple and have high dividend yields). That explains why the valuations of low-point stocks are higher than high-point stocks.

But while it seems to be logical that stocks across the ESG spectrum are similarly rated, it would indicate that the market is not taking the risks and opportunities fully into account. If it were, we would expect to see more uncertainty in recommendations for high-point stocks, reflecting the fact that stocks with a lot of risks and opportunities are more likely to experience a significant swing in their fair value in the short term compared with stocks with fewer risks and opportunities. Yet, the uncertainty (coefficient of variation) across the ESG spectrum is very similar. That implies the market thinks stocks are equally likely to experience a similar movement in fair value regardless of the ESG risks and opportunities. This disconnect between bottom-up fundamentals and market prices is where sophisticated ESG analysis can add significant value.

It also gives us an indication of how these stocks might perform over the next decade as the mega-trend of ESG investing continues. Consider European large-cap growth stocks which have had a good run compared with their value peers

over the past decade. As more investment managers learn how to integrate ESG analysis into their investment process, and funds in the segment grow as previously discussed, then these two factors may widen the performance delta between the two types of stocks.

In terms of sectors, autos and banks stand out negatively with ESG risk contributions well ahead of the weights of their market values. This puts German and Spanish stocks on our negative watchlist. French stocks do relatively better, not only reflecting the extra efforts around non-financial disclosures in the country, but also benefitting from ESG investors' home bias. That is because the vast majority of ESG-committed assets in Europe are managed by French domiciled funds. Furthermore, the French equity market is dominated by a high number of growth stocks relative to their value-based peers. This plays into the hands of ESG-committed mandates.

The final point about French stocks neatly introduces the final outcome of this new ESG framework and the result may be a surprise. At first glance, it may seem like French stocks, and others that make comprehensive ESG disclosures, are more investable from an ESG point of view. That is not necessarily the case. Indeed, the more disclosures a company makes, the more investors are able to take them into account. In other words, the tighter the regulatory standards surrounding ESG disclosures, the smaller the potential alpha. That means the biggest gains can be made in emerging markets.

In fact, if we examine a portfolio of “ESG leaders” based on third party vendors' ratings in various regions, and compare their performance with local benchmarks, we see that stocks in the emerging markets of Europe, the Middle East, and Africa have outperformed by an average of 1.8 percentage points per quarter for the last decade. In contrast, it is harder to find alpha in the more ESG-conscious market of the United States. Based purely on blunt ratings by outside professionals, leading American ESG stocks have slightly underperformed the benchmark over the last decade.

This underperformance in the world's most developed markets is an increasing frustration for fund managers. If their poor performance continues, passive ESG funds will become more popular. So far, only one per cent of exchange traded funds (by assets under management) are tagged with ESG-related labels, but this figure has doubled in each of the past two years and could hit ten per cent by 2025. Given the current rates of growth in the ESG market it is only a matter of time before investors become more discerning and give up on active managers and move to low-cost passive alternatives. The only way for fund managers to convince ESG investors of their worth is to deliver better performance. Deutsche Bank's new ESG platform is one way to do this. ●

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Where are the opportunities and risks?

While just 29 per cent of ESG risks and opportunities arise in the governance category, we believe investors should focus on governance issues before social and environmental ones. Although the latter two can be far more high profile, particularly when something goes wrong, they are more effectively managed when best-practice governance is implemented in the first place. The best catalyst for this is for fund managers and investors to integrate ESG into their investment process.

Using Deutsche Bank's new ESG investment structure, we can identify the most common ESG issues. Of course, the most important issue for one company may be different to all those we mention here, but these are the threads that many companies have in common.

Governance

Board structure issues can be distilled into three buckets. The first is that, for many companies, at least three-quarters of the board should be independent directors. The second is that board tenures should be under ten years to avoid complacency and, finally, board members should have no more than three other board positions so as to not dilute their focus.

There is also significant value to be found in removing takeover hurdles. These include poison pills or takeover-constraining elements, such as needing a 75 per cent super-majority to approve a sale of the business. Other opportunity areas come from ensuring the company adheres to the one-share-one-vote system (see our article on dual-class shares, "Billionaires and their offspring" for a deeper discussion) and introducing clawback policies for executive compensation. By far, the best way for shareholders to ensure good governance is to demand a tight link between management pay and a tangible set of ESG targets.

Social

The complexity of supply chains increases the risk of an adverse outcome that results in negative press or attention from non-government organisations that then has an effect of fair value. Just one example is a social media-organised boycott which is an increasingly common source of value destruction.

The majority of social issues that affect fair value involve litigation. Not only does this potentially involve a requirement for financial compensation but also, it hurts the brand and reputation of the business. The biggest issues here involve anti-competitive behaviour, bribery, and corruption. The other two big areas of focus are product quality and employee welfare.

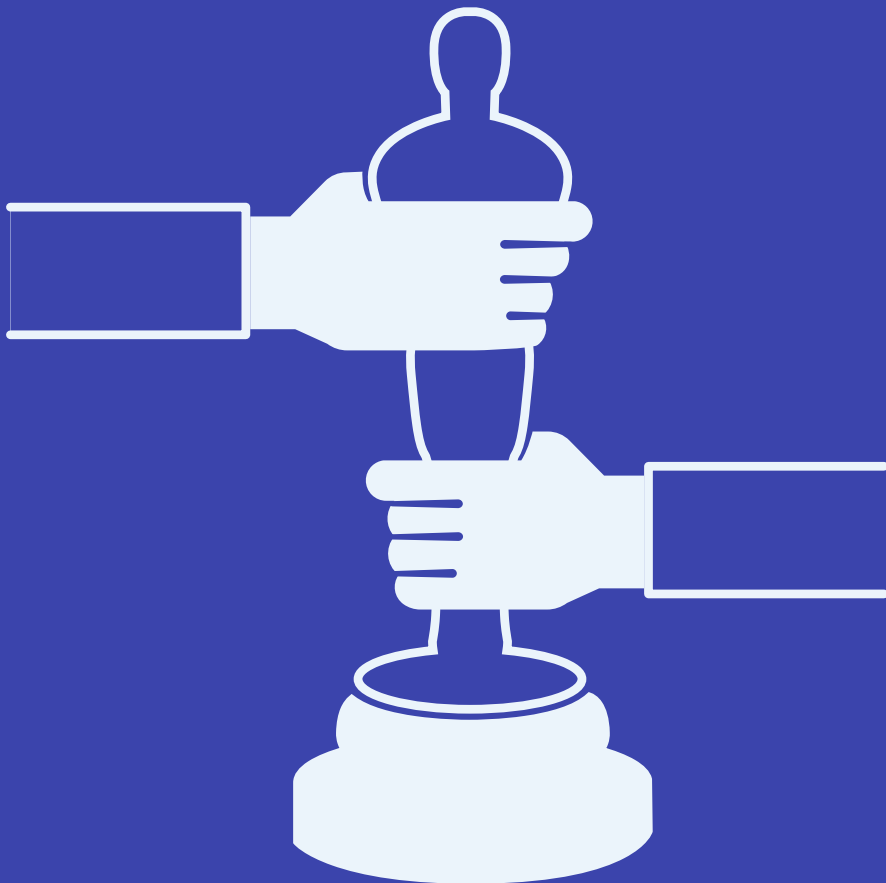
Environment

Unless significant additional progress is made, it appears the EU will miss its target to cut carbon emissions by 40 per cent by 2030 compared with 1990 levels. Hence, the biggest threat to a company's fair value from an environmental standpoint is tighter regulation.

Risks here relate mainly to higher or more volatile energy prices, supply shortages, and tighter regulation. About half the points from our analysis relate to carbon and energy intensity items. Autos are particularly exposed through their exposure to increasing restrictions on Diesel engines. Other sectors with a particular environmental exposure include resources, utilities, oil and gas, and chemicals.

French stocks do relatively better, not only reflecting the extra efforts around nonfinancial disclosures in the country, but also benefitting from ESG investors' home bias. That is because the vast majority of ESG-committed assets in Europe are managed by French funds.

Governance – Five radical ideas to improve audits



Luke Templeman

Just a few minutes after *La La Land* won best picture at last year's Oscars ceremony, the staff at PricewaterhouseCoopers must have felt ill. As it emerged *Moonlight* had actually won, the inevitable ire fell on PwC. Given the firm has collated the Academy Award votes for 83 years, was the mistake the ultimate advertisement for auditor rotation? ➤

The Oscars debacle did not cost investors any money but film aficionados are not the only ones concerned about the work of audit firms. Deutsche Bank research shows analysts of two-fifths of Europe's biggest companies believe there are risks and opportunities in the company's audit function. So how can auditing be improved? Everyone has an opinion so here we present five radical ideas. As with all suggestions they contain their own problems but, hopefully, they may help open up the current conversation.

1) An auditor should be appointed and paid by the company regulator

One of the great criticisms of auditing is that because the client pays the auditor, there exists a conflict of interest. In most cases there is no problem. But in some cases the arrangement can boost the risk of aggressive accounting. Being paid by the regulator does not let the company off the hook financially. It would pay a fee to the regulator who would then negotiate with the potential auditors for the work.

This arrangement would not amount to a nationalisation of auditors. Rather, it could sharpen the focus of auditors and ensure a closer line of accountability to stakeholders outside company management, and go some way to eliminating the perception of a conflict of interest.

Taking this idea further, company regulators could have their own company audit supervisors. These would not be people who sit down and work with the auditors on the ground. Rather, they could act like an independent director on a company board. They could sit in on audit committee meetings or be involved in partner-level meetings before the accounts are formally approved.

2) Introduce auditor disclosures

The auditor's report of almost every company looks identical and is filled with generic wording. That means a company that passes an audit with flying colours can appear the same as one that holds on by the skin of its teeth. In terms of disclosures, amounts paid to accountants for audit and other services is disclosed but very little else is revealed.

So how is an investor supposed to determine the quality of the audit? Perhaps auditors should reveal the average number of years of experience of the personnel on the audit, or the number of hours spent on the audit by qualified staff versus the non-qualified juniors that have a reputation for being lumped with the grunt work.

Following on from this, investors may find it useful to understand the weighted average number of hours per person per day that have been spent on the audit. If the junior accountants are spending many late nights in the client's office, as can be the case, it is unlikely they are as efficient in their detective work as they need to be. This disclosure could promote the same kind of regulations that limit a pilot's flying hours. After all, the job of both auditors and pilots is to lower the risk of a catastrophic event.

Finally, other disclosures could involve naming the competitor firms the company has recently audited and discussing the prior positions of senior auditors and the partner as well as any outside directorships they may have.

3) Rather than splitting consulting divisions, why not merge them with audit?

There is constant chatter in political circles about forcing accounting firms to shed their consulting arms and become audit-only firms. Some changes were made following the Enron collapse and the introduction of the Sarbanes-Oxley legislation. But forcing audit firms to split off non-audit

divisions is not necessary to improve audit quality and some serious downsides may emerge.

The first problem is that splitting audit firms could only be done with global consensus. Given the differing and entrenched interests in play, this idea becomes merely theoretical. Second, audit-only firms may find it harder to attract staff as many juniors who take jobs as auditors do so to move onto more interesting work within the organisation once they have qualified as a professional accountant. Without this incentive, salaries would almost certainly have to rise and these would be directly passed onto customers and investors.

So, if accounting firms are to retain their consulting arms, the perception of a conflict of interest will remain. So rather than operating with Chinese walls, why not merge the divisions completely? Several benefits may ensue. First, it would go some way towards eliminating the problem of auditors checking, but not being responsible for, company models that feed into fair value calculations. Take, for example, a real estate company that writes up the value of its property on the basis of an external valuation (which it paid for itself). Currently, the auditor checks the valuation is reasonable, but the responsibility for it still lies with the valuer and the company's directors. Instead, the consulting division of the accounting firm could perform the valuation itself. The auditors will then have greater certainty as to its accuracy, and a potential conflict of interest will be eliminated. Of course, this arrangement would have to be buttressed with the threat of serious banking-style fines for nefarious behaviour.

4) Management incentives. More focus on return on assets

One of the most controversial topics to emerge from the financial crisis was the accounting rule that measures assets at fair value. Following violent swings in value, investors have become strident critics of company managers if they believe they have inflated the company's asset values and then pressured auditors to accept the models on which those values are based. But there is a flip side to this. As assets rise, the return on them falls. A quick look at American companies shows this has been taking place for some time. Just before the financial crisis, almost 30 per cent of companies in the S&P 500 had a return on assets of over ten per cent. That figure has now dropped to just 21 per cent.

If shareholders required management incentive packages to be more weighted towards return on assets, it would diminish the incentive for managers to argue for fair-value asset increases.

5) Five-year audit tenure

Those who argue against mandatory, short-term audit rotation usually point to increased costs and a steep learning curve for new auditors. This is exactly how it should be. When new auditors learn about the business from scratch, it is easier for them to ask simple questions (which are often the most on-point) without the baggage of having conducted the prior year's audit. Processes that have "always been done this way" are suddenly given a fresh degree of scrutiny.

There is plenty of research on the topic. One study found that in Italy, South Korea, and Brazil where mandatory auditor rotation is in place, there was significantly less earnings smoothing and more timely loss recognition. True, audit quality suffered in the final year, but as management know a fresh auditor will be scrutinising the books from scratch next year, there is little scope to manipulate the figures without consequences. Not surprisingly, the study found that the benefit to audit quality was larger than the cost by a factor of at least two.

Some may argue that a five-year rotation rule may mean companies go shopping for the audit firm that will sign-off on the most aggressive accounting, however, three decades ago there were eight big firms and there was very little talk of that. Today, the key risk being discussed is that there are too few global audit firms, not too many from which a company can choose.

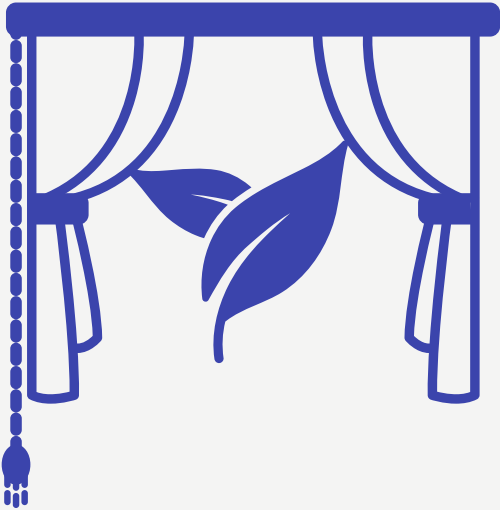
A five-year rotation rule could also encourage second-tier firms to challenge the big-four – the unicorn of audit policy. The big-four are entrenched in their position of dominating the large-cap audit market as they are the only ones with the global capabilities to do so. If tenders arise too infrequently, there is little incentive for second-tier firms to build the capabilities required to compete. Additional opportunities to tender could fix that.

While no idea to improve audits can make everyone happy, the one thing that everyone does agree on is that auditing must be improved. And as mainstream ideas are yet to find anything approaching a consensus, perhaps it is time to consider some 'left-field' suggestions. If nothing else, they will make for an entertaining conversation. ●

Luke Templeman is an analyst in the thematic research team.

Those who argue against mandatory, short-term audit rotation usually point to increased costs and a steep learning curve for new auditors. This is exactly how it should be.

Bond markets – The pickles of green finance



Apple's shiny new campus, Apple Park, is more than just an architectural landmark. The building is fully powered by renewable energy, including biogas fuel cells and solar panels. On the weekends, the excess energy is fed into the public power grid. In fact, Apple claims that 96 per cent of its facilities across the globe run on renewable energy.

The trend towards corporations embarking on environmentally friendly projects is not new. What is new is the way they are funding them. In the case of its new campus, Apple partly paid for it with funds from a \$1.5bn green bond it issued two years ago. That fund raising was then followed by a \$1bn green bond issuance last year. Much of this has been spent on green buildings and energy efficiency.

Apple aside, the world's biggest green bond issuer is also focused on building more sustainable real estate. Last year, Fannie Mae, a US government-owned entity that provides a secondary market for home mortgages, originated \$25bn of green bonds. Most of these

were mortgage-backed securities backed by either green building-certified properties or properties for multifamily homes that target a reduction in energy or water consumption. Globally, one-third of green bonds finance renewable energy projects, another quarter finance energy efficient buildings while the remainder is primarily used to finance clean transport and sustainable water management projects.

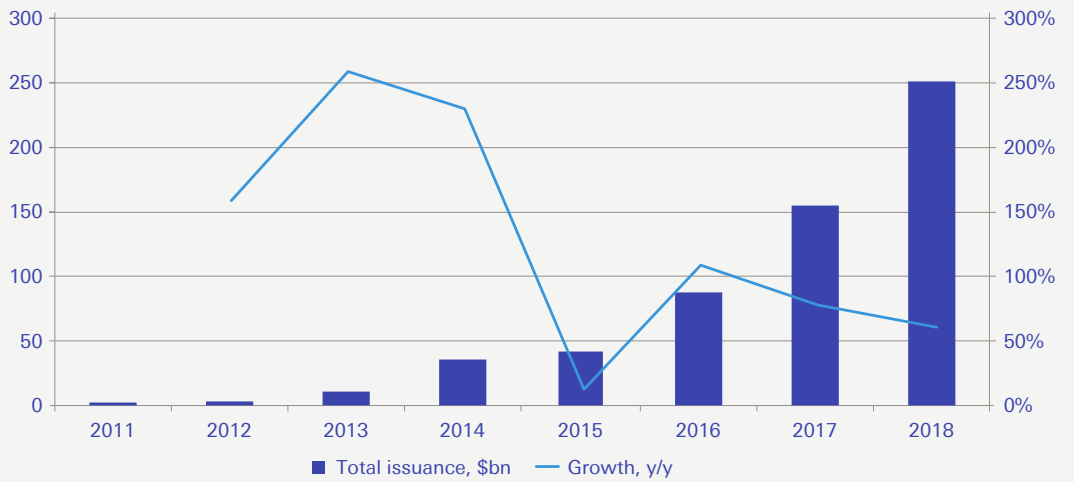
Despite these two examples by some of America's highest-profile companies, these projects are not typical. Indeed, Europe remains the biggest market for green bonds. Out of a global green bond issuance of just over \$150bn last year, the US accounted for only about one quarter, and if Fannie Mae is excluded the figure would be only about ten per cent. In contrast, European countries constituted over one-third of global activity last year with five countries (France, Germany, Spain, Sweden and Netherlands) accounting for most of the issuance.

There are a number of reasons that American companies have not jumped on the green bond trend. Among them are worries about the definitions of control and usage of the funds in the US. The issuers of green bonds must use the proceeds to finance projects with a positive climate or environmental impact. However, some potential issuers worry about future litigation as the strict legal definitions of certain usage guidelines have not been thoroughly tested.

Despite the nerves in some quarters, the green bond market is exploding. As the above chart shows, issuance has tripled over the last two years and is expected to surge past \$250bn in 2018. It is true that this represents merely 2.2 per cent of total bond issuance (and even in Europe, green bond issuance comprises just over three per cent of the total market).

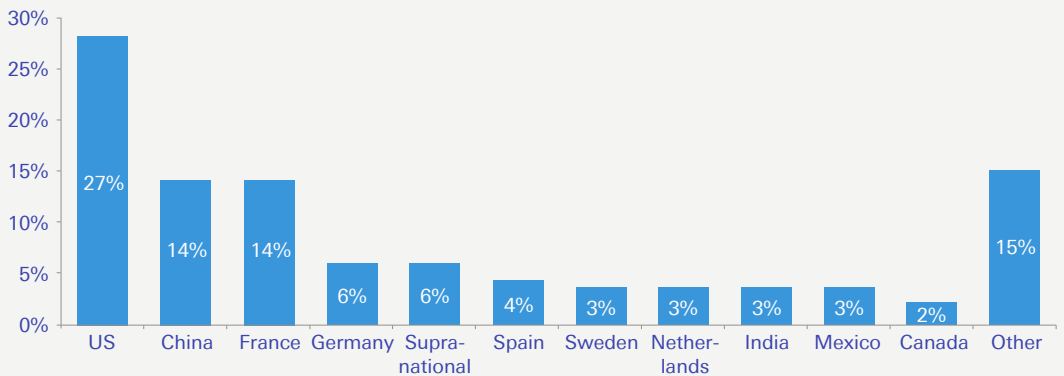
China is also emerging as a key player in the green bond market. Last year, it issued 14 per cent of the world's green bonds. That is more than the US if Fannie Mae is excluded. The point is to address the environmental problems that have been caused by the country's rapid industrialisation.

Global green bond market size



Source: Climate Bonds Initiative, International Finance Corporation, Deutsche Bank

Breakdown of issuance by country (2017)



Source: Climate Bonds Initiative, International Finance Corporation, Deutsche Bank

This trend is being fuelled by increasing demand from investors. In our sample, which represents about half the total amount issued between April and December last year, the median oversubscription ratio (the total amount of bids for the bonds as a proportion of the amount issued) was 2.6 times for euro-denominated issuance and 2.5 times for dollar-denominated ones. In both cases that was higher than that for regular corporate bonds, which were oversubscribed by 2.5 times and 2.1 times respectively.

Some people are sceptical about the idea of green bonds, calling them nothing more than a marketing gimmick. Certainly, some companies may be liberal in their labelling of green bonds, but that is beside the point. In the end, the market is being propelled by investor appetite and judgment.

If we put aside for one moment, the fact that many investors are attracted to green bonds because they want to make a positive impact, the key factor that explains investor demand is that they offer a slightly higher, but similar, yield to equivalent, regular corporate bonds. As the following table shows, high-yield green bonds pay a larger premium over corporate bonds than do investment grade credit, however, the low volume of high-yield green bond issuance skews these results.

Yield differential between green and comparable bonds (percentage points)

	Investment grade	Non-investment grade
EUR	+0.16	+0.5
USD	+0.05	+1.3

The pickles

If the green bond market continues to grow at its current rate, it will soon become mainstream. Indeed, in just five years, the green bond market could comprise over 15 per cent of the global corporate bond market. That will inevitably expose it to the challenges that are currently underappreciated by both investors and issuers.

First, there is currently no official international definition on what constitutes a green bond and this can slow down market growth and scare off some investors. Into this vacuum, some organisations have begun to develop their own guidelines. The non-profit group Climate Bond Initiative is more developed than most and an increasing set of international issuers conform to its standards. Yet there are wide variations in rules across the world. The differences are not necessarily 'good' or 'bad', they merely mean investors operate with different assumptions in different regions. For example, China has its own green bond norms that are very different from European ones. The Chinese regulator allows issuers to use up to half the proceeds for general corporate purposes, such as repaying loans or investing in working capital. In contrast, European guidelines require 95 per cent of a green bond's proceeds to be invested in green projects. From one point of view, a Chinese bond may not be perceived as being 'green' in the eyes of international investors. On the other hand, Chinese investors may find European norms unnecessarily restrictive. In addition, the rules about the type of use are different. For example, an investment in coal-fired power plants that increases their efficiency is considered 'green' usage in China, while in Europe it is not.

A related challenge is the potential for 'greenwashing'. This marketing term describes the practice of making a misleading claim about the environmental benefits of a project to give a company a more glowing public image than it deserves. Anecdotes abound. For instance, some

would argue whether a company that produces natural fur coats should label its products “eco-friendly”.

The lack of mandatory verification of the use of green bond proceeds leaves companies space to mislead investors and attract the additional demand that typically comes with a green bond issuance. Environmental activists have criticised Poland for issuing the first ever sovereign green bond but, at the same time, defending its coal industry and vetoing environmental laws. International agreement on a mandatory verification rule could help add transparency in situations like this.

Finally, as the market grows and additional regulations are brought into force, the additional expenses associated with green bonds will increase. Usually, these extra costs are incurred by the issuer and can include certification costs and third-party review costs. Given that green bonds are issued at a similar price to comparable regular bonds, a more liquid market might make them a less attractive option for well-rated issuers that can easily raise debt elsewhere.

Outlook

With tailwinds for both demand and supply, the green bond market is certain to continue its expansion in the short term. On the demand side, responsibly-committed investments are becoming increasingly popular: they accounted for one-quarter of global assets under management in 2016 and are expected to double that proportion by 2020. Asset managers have enjoyed the inflows and are launching new sustainable investment strategies.

The increase in demand helps feed the increase in supply and encourages companies to embark on environmentally-sustainable projects. Funding these with green bonds can unlock benefits for their shareholders. When Deutsche Bank analysts broke down the ESG risks and opportunities for the 50 largest stocks in Europe, they found that environmental issues were the most important and could be improved for every

company. The upside, both financially, and as a result of lower risks, from pursuing these opportunities is also significant. The ‘opportunity ratio’ of 54 per cent outdid social and governance opportunities at 48 per cent and 42 per cent respectively.

Which brings us back to the Apple Park campus. While many observers scoffed that only a company with Apple’s cash flow could afford to build a sustainable headquarters, the causation may actually run in the opposite direction. As more companies take advantage of green bonds, regulation will catch up. As that occurs, investor interest should grow further. That will please both investors and environmentalists. ●

We thank Nikita Mitrokhin for his contribution to this piece.

Equities – ESG with one eye on the macro

An ESG investor's first priority may be to allocate their funds in a compliant way, however, they certainly do not want to ignore the other aspects of their investment, such as sensitivity to macro factors and valuations. Deutsche Bank's methodology for ranking ESG-compliant stocks highlights this point (see our piece "How fund managers can use ESG to assess fair value" for a deeper discussion of how the methodology helps investors). But the fact of the matter is that ESG funds tend to underperform the market. The average European ESG fund has underperformed its benchmark by 1.2 per cent per year since 2000.

Understanding the drivers behind the performance of ESG stocks is therefore key to turning around the current underperformance of ESG investing. To do this, we examine the

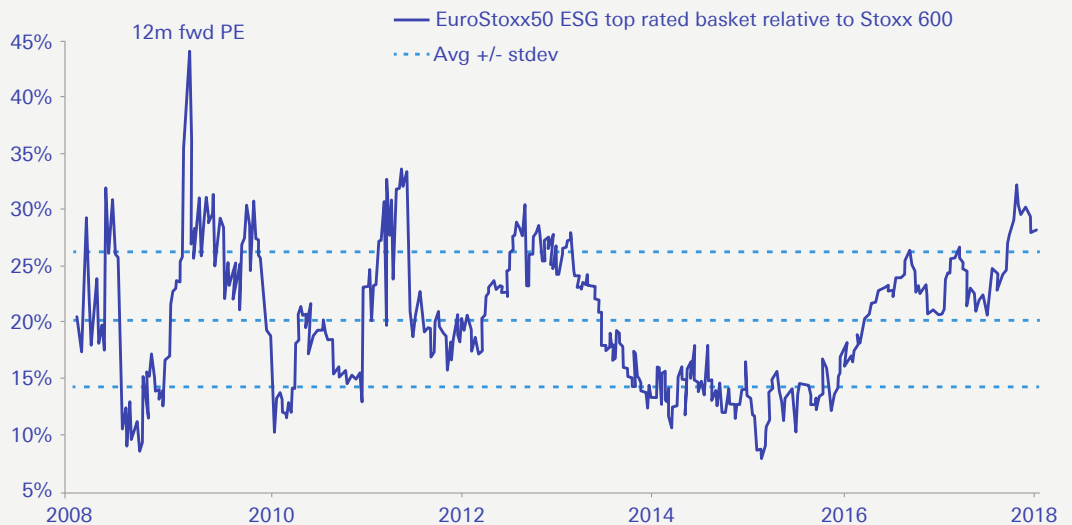
top-ten rated European stocks in Deutsche Bank's ranking.

The first interesting finding is that the relative performance of the top ten stocks has a strong positive correlation with bond yields and also moves in step with the equity market itself. That is to say, the ESG basket is highly cyclical and tends to outperform the market in periods of rising bond yields and buoyant equity prices.

When we look at valuation, our basket of ESG stocks is already trading at demanding levels. Relative to earnings, the stock prices are more than one standard deviation above their long-run average. They have only hit these peaks four times in the last decade and each time they did not last long at these levels.



ESG stocks already trade at demanding valuations



Source: Deutsche Bank

The reason for both the cyclicity and the elevated valuations of the stocks in our top-ten ESG basket lies in the sector composition. Four of our top ten stocks are constituents of the capital goods sector. This sector is not only very cyclical, but also is among the few in Europe not suffering from obvious business model disruption risks. While the capital goods industry will undergo evolutionary change over the coming years, it appears most of this change will be embraced in-house. That is, capital goods companies are investing heavily in automation and robotics, energy efficiency and battery storage (for a deeper discussion on automation in the capital goods sector and others, please see Konzept #13 from June 2018). There appear to be few competitors from outside the industry that have a

head start and could usurp them.

In contrast, dark clouds hang over other European sectors. Banks face significant challenges from paytech and fintech startups, and automakers are struggling to assume leadership positions in vehicle electrification and autonomous driving technologies. Meanwhile, energy firms are trying to understand what changing regulations on decarbonisation mean for the industry, and even food & beverage stocks face the threat from craft beer challengers and changing regulation. The incumbents in each of these industries face threats from outside their direct market that could erode their market leadership at best and could potentially create entirely new markets.

Capital goods are trading at the upper end of their valuations

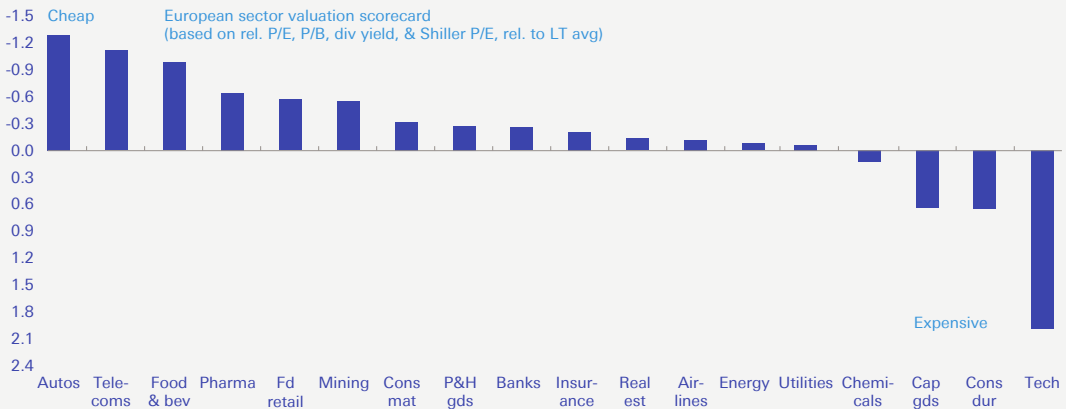


Source: Deutsche Bank

To an extent, stock analysts have already taken note. Over the past ten years, food & beverage was the top-ranking sector in the MSCI classification of European growth stocks. Yet, increased risks to its business model have recently seen it to lose that crown, with capital goods taking over the top spot. Since October 2015, the capital goods sector has outperformed the wider European equity market by one-quarter.

As a result, it now screens as one of the three most expensive sectors on our European sector scorecard. The other sectors sharing in the top three are technology and luxury goods. Both these sectors appear to have little plausible risk of business model disruption. In contrast, the two cheapest sectors, automakers and telecoms, have meaningful structural headwinds that have scared off investors.

European equities valuation scorecard by sector



Source: Deutsche Bank

The cyclicity of our ESG basket is explained by the fact that capital goods' performance relative to the market typically moves in line with the swings in Euro-area PMIs. Furthermore, over the last decade, the sector's sales exposure to Europe has been shrinking while the exposure to emerging markets has been growing. As a result, the sector has become increasingly correlated with movements in Chinese PMIs. In other words, the stock prices of capital goods firms will tend to outperform as growth momentum accelerates in both Europe and China and conversely, it will underperform when PMI momentum slows.

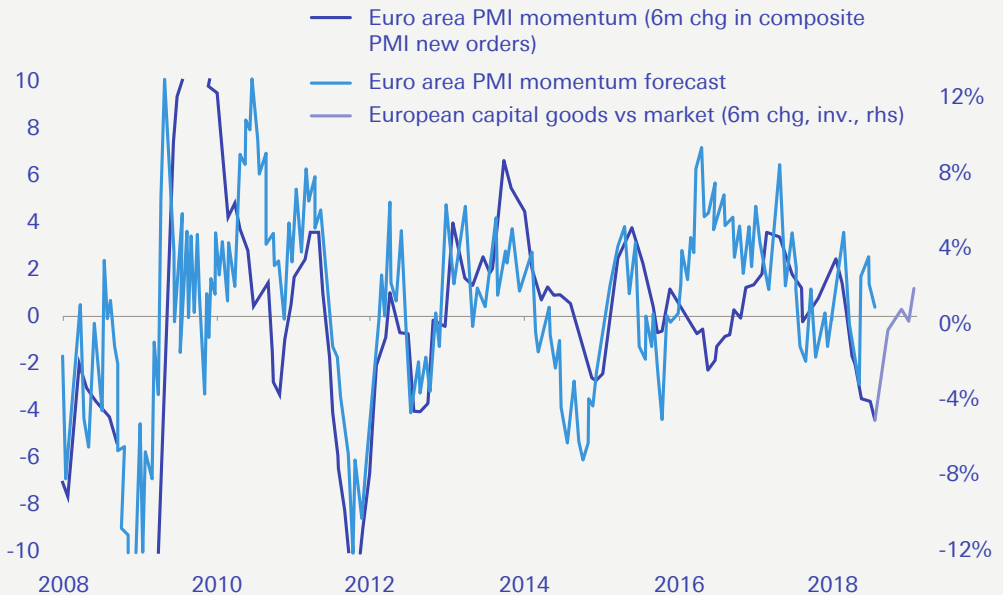
It is because of the relationship between cyclical stocks and PMIs that we worry about their current levels. If we continue to use the capital goods sector as a proxy, we can see from the following charts that the sector has outperformed its historical growth relationship. Although PMIs are forecast to rise, history would

suggest cyclical stocks, such as capital goods, will revert to their historical relationship and fall relative to the market.

There are several reasons for the outperformance of cyclical stocks, but there are two that particularly stand out. The first relates to the structural advantages of stocks in these sectors, as previously discussed and especially relative to other European sectors. A second reason for the widening gap between the sector's fundamentals and its fair value is that it has strong non-financial indicators, as reflected by our high ESG score for the sector.

In other words, investors are slowly catching up with the positive ESG sentiment around these stocks (our feature article "Investing with α -Dig" discusses how investors are poor at timing the impact of ESG events). As a result, investors have piled in.

Capital goods and PMIs go hand-in-hand



Source: Deutsche Bank

Some may say that it just happens to be the case that a sector with high environmental and social standard and low disruption risk is also cyclical, but it goes to show that, when investing in stocks with strong ESG credentials, the macro-economic sensitivities and valuation factors can have a significant impact upon returns.

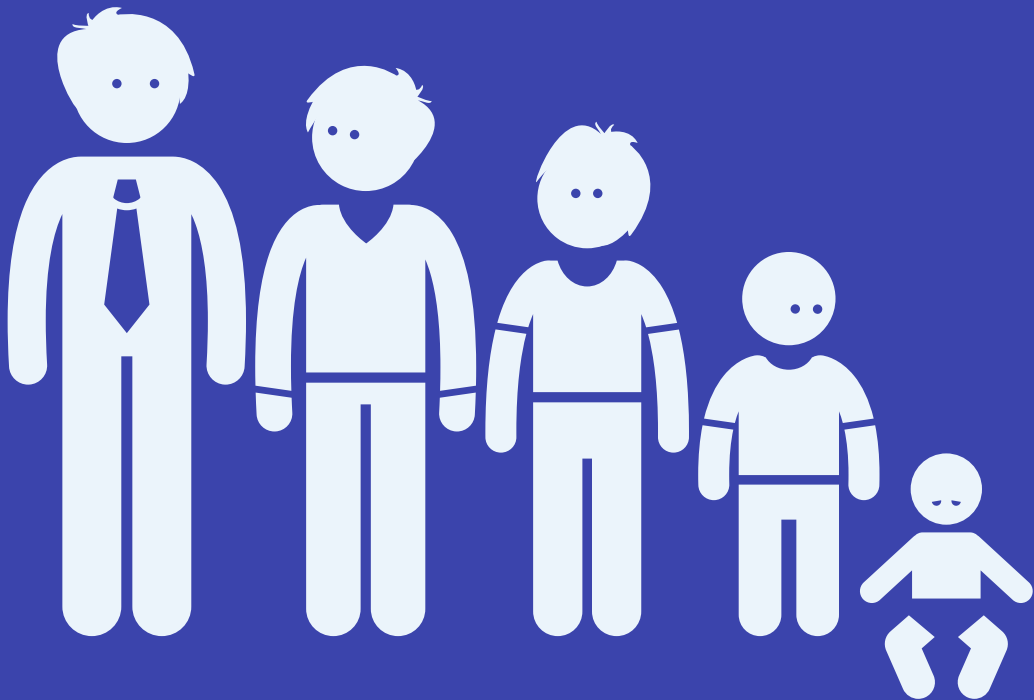
There are some macro factors on the horizon that could offset the current lofty valuations of ESG stocks. As we mentioned earlier, the performance of our top-ten ESG stocks is correlated with German bund yields. The current combination of rebounding PMIs, declining central bank balance sheets, and rising core inflation suggests bond yields will rise in the near term. In this case, these stocks should continue to outperform.

Furthermore, the top ESG stocks' could benefit from a rebound in Euro-area growth momentum which, by early next year, should be assisted by several factors, including a weaker euro, easing credit standards, a more favourable inventory cycle, and Chinese growth momentum given the recent easing of monetary policy. Of course, in the longer run, this exposure makes these stocks particularly vulnerable once the economic recovery finally comes to an end. The point is that at any particular point in time, the themes driving the top ESG stocks may be subject to a wider array of macro fluctuations that initially meets the eye. ●

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Over the past ten years, food & beverage was the top-ranking sector in the MSCI classification of European growth stocks. Yet, increased risks to its business model have recently seen it to lose that crown, with capital goods taking over the top spot.

Dual-class shares – Billionaires and their offspring



Sahil Mahtani

When Viacom adopted its dual-class share structure in 1990, Sumner Redstone was on course to be one of the great Hollywood moguls. From a hostile takeover three years earlier, he would eventually build Viacom up into—at its peak—a \$40bn behemoth that engulfed CBS, MTV, Showtime, and Paramount pictures. The prospect of going along on that journey is why the company's shareholders agreed to a structure that allowed Redstone to control 80 per cent of the company's votes while holding less than 10 per cent of the equity. >

Twenty-eight years later, the affair has ended. Viacom suffers from a power vacuum at a time when the media industry is changing rapidly. Viacom, and its offshoot CBS, are embroiled in fights. One thing is clear, however. The public investors who own about 90 per cent of Viacom's equity have little control.

Viacom is a uniquely disastrous example of what can go wrong with dual-class shares, but it does expose the main problem with them. What is useful in the early stages of a corporate life can become a liability in the years ahead. As SEC commissioner Robert J. Jackson Jr., put it, "dual-class ownership don't just ask investors to trust a visionary founder. It asks them to trust that founder's kids. And their kids' kids. And their grandkid's kids. (Some of whom may, or may not, be visionaries)."¹

Given the risk of a Viacom-type situation, why do multiple class shares even exist? After all, it seems natural and inherently fair that shareholders who supply capital receive an equal say on matters that affect that capital.

Yet, today the one share one vote system is under pressure all over the world. In Europe, the Florange law from 2014 doubles voting rights for those owning shares for more than two years, creating "loyalty shares." In Italy, legislation allows companies such as Campari and Amplifon to offer loyalty shares to certain shareholders. The Hong Kong Exchange, chastened by its failure to attract Alibaba, Baidu and other Chinese technology companies to list in the city-state, finally this year decided to allow companies deemed "innovative" to list with dual-class share structures.

At their worst, such tweaks are a race to the bottom in corporate governance. But supporters of dual-class shares make two broad points. First, venture capitalists point out that dual-class shareholdings might be useful for startup companies at earlier stages of development because of the firm's high reliance on human as well as financial capital. A dual-class share structure allows the company to grow while maintaining continuity of management. Further equity dilution is the alternative but it may not be in the interests of shareholders because it weakens the link of the entrepreneur to the business. Moreover, if sophisticated investors wish to finance the entrepreneur under such terms, then what is the problem?

The second point comes from corporate governance experts, who are concerned about equity market short-termism. They suggest that equity investors are more likely to sell shares than engage with a company in the event of a difference in views. As a result, managers are encouraged to seek short-term profits, reduce capital expenditure, take more in profit margins, and return cash through buybacks and dividends. If investors were rewarded for their engagement with loyalty shares, it could encourage their engagement. Such devices have been proposed by those as august as Vanguard founder John Bogle, former McKinsey managing director Dominic Barton, and former US vice president Al Gore.

Both arguments are not totally wrong. On corporate short-termism, there is evidence that protecting companies from the pressures of the public market can support innovation and investment. One study showed that private corporations have an investment rate nearly twice as high relative to public firms, 6.8 per cent versus 3.7 per cent of total assets per year.² Moreover, following the transition to public equity markets, companies have been shown to pursue less risky innovation in comparison with those that withdrew their filing for an initial public offering and remained private.³

As for the startup argument, the success of many technology firms suggest that at the very least dual-class shares don't systematically hurt

startup firms. There are also examples beyond Silicon Valley. In Sweden, where over half of the listed firms have double voting rights, certain shareholders like Industrivarden and Investor AB have disproportionate power across many large firms to appoint non-executive directors and tackle underperforming managers. That doesn't appear to have systematically hurt either, with the Swedish stock market routinely generating some of the best returns among global equity markets.

Yet it is also true that for every Square and Workday, one encounters a Go-Pro or a Snap, companies where dual-class shares have empowered managers that fail to deliver positive equity outcomes. Snap Inc, for instance, is down 30 per cent since it listed in 2017, when it gave new shareholders no voting rights at all. Moreover, Snap's chief executives appear to have made strategic mistakes that its public shareholders are entirely unable to overrule.

The pragmatic question is what do broad-based empirical studies say on the impact of dual-class shares on performance in aggregate? A major review of empirical studies on dual-class shares showed a mixed consensus.⁴ For instance, there are studies that show some underperformance from firms with a dual-class structure, as well as higher pay for chief executives and lower efficiency of cash resources. However, there are also studies looking at the post-share-structure conversion performance of the same company showing that a dual-class structure has no impact on performance.

As a result, the jury is out on whether dual-class shares in aggregate and by themselves are good for the performance of equities or not. But the question of performance may be the wrong one to ask. In an era of increased focus on corporate governance, the more pertinent question is whether multiple class shares should be permitted and if so, what sort of regulation should govern them?

Three common-sense suggestions present themselves. First, perpetual dual-class shares in the Viacom mould should be prohibited. There is no good reason to entrench the power of any managerial class. As SEC Commissioner Jackson, put it, "one problem with perpetual dual-class is it removes entrenched managers—and their kids, and their kids' kids—from the discipline of the market forever. Simply put: asking investors to put eternal trust in corporate royalty is antithetical to our values as Americans."⁵ Other countries may find it is against their values as well.

This is an argument against taking a bloodless, technocratic view on issues of ownership. In a world where rising economic inequality has contributed to a rejection of establishment parties all across the world, perhaps the real test that dual-class shares must meet is not whether they facilitate higher share prices at the margin, but whether creating an unaccountable corporate class is compatible with the level of equality required for a wide-franchise liberal democratic system. The answer is clearly no.

But just to address the narrow, technocratic point: there are also sound operational reasons for rejecting perpetual dual-class shares. As Lucian Bebchuk and Kobe Kastiel put it, the further one gets from the IPO date the greater the risks associated with these structures.⁶ There is evidence that shortly after an IPO, dual-class firms trade at a premium—but, as the company matures, this premium eventually disappears.⁷

Similarly, there is evidence that younger companies benefit from dual-class shares more than mature companies do. A Columbia University study reveals that as groups with dual-class structures age, they experience a 7-9 per cent larger decline in Tobin's quotient (the ratio of the market value of a company's assets divided by their estimated replacement cost of

assets) against a 6-7 per cent higher valuation when they are new to the public market.⁸

Technically, there are many ways to restrict perpetual dual-class shares. The founder's class of shares could revert to regular voting shares after a certain period of time (as with Yelp.com⁹), or in the event of the founder's retirement, incapacity or death (as in the case of Chinese e-commerce firm JD.com). Transfers of such shares could be restricted. Perhaps multiple-voting right shares must convert into single-vote shares if ownership is transferred to persons who are not affiliated with the original holders (for example, LinkedIn, Zynga).

Second, simplicity should be a key operating principle. One serious mark against multiple class share structures is complexity. Complexity is a prelude to opacity, which reduces trust and benefits those who created the laws, often insiders. By this logic dual-class shares structures should be permitted for certain fast-growing firms, but never as a default system. Where they are permitted, they ought to be transparent and minimal.

Third, it may make sense to reduce the gap between the classes of shares to prevent the excess concentration of power. In Singapore and Sweden, for instance, no share may carry voting rights more than ten times greater than the voting rights of any other share. This is to avoid the situation in the 1920s when in Germany, some firms had shareholders with more than 1,000 or even 10,000 votes per share, while the 1925 Dodge Brothers trial revealed that investment bank Dillon Read controlled Dodge's entire voting power despite putting up less than two per cent of the funds.

The Dodge Brothers trial is a reminder that history may well be repeating itself today. In the 1920s, many US companies went public with dual-class share structures. After the Great Depression, the NYSE adopted a "one share, one vote" rule that guided the securities market for decades. It was only during the corporate takeover era of 1984 that the NYSE suspended enforcement of its one share, one vote rule. The increasing scrutiny of dual-class shares since the more recent financial crisis suggests that we may yet be staring at the barrel of another regulatory sea-change. ●

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Ultimately, the question of whether multiple class shares facilitate outperformance or lead to underperformance may not be answerable, for three reasons. First, endogeneity is an inherent problem with all the empirical studies. This is the concern that underperformance may lead companies to impose dual-class structures rather than being a consequence of them. Or to pose the question differently, do dual-class structures lead to underperformance or do underperforming managers establish dual-class structures to protect themselves from hostile takeovers? The answer to this question relies on considerable subjectivity and lends itself to further discussion.

Second, corporate structure is always just one of many variables in play when determining the causality of success and failure. In the Snap example earlier, was its rocky performance since listing because its corporate structure insulated bad decision makers or simply due to greater competition? Similarly, Nike may be more profitable than Adidas because it sells a better product and has a better geographical mix, rather than because it has a dual-class structure that empowered management. Determining the true causality of corporate outcomes is inherently more an art than a science.

Finally, any dual-class structure cannot be seen in isolation away from particular regulatory and legal contexts. For instance, the US may allow dual-class structures but it also allows shareholders to take private action to sue for damages. In Hong Kong or Singapore, greater reliance is placed on rules to prevent the abuse of control before it occurs; enforcement is primarily through regulators and class action suits are not allowed. It is therefore not straightforward to ascertain whether any outperformance in the US or Hong Kong was caused by a dual-class structure, the legal structure of the jurisdiction, or an interaction of the two.

That is reflected in the fact that control premiums, an indicator of the level of private benefits associated with control (and which are much smaller in systems with better protection of investors and better tax enforcement) are small in both France and the US, despite the fact that the former has many more dual-class share firms than the latter (54 per cent vs 0-10 per cent respectively).^{10,11} That suggests that what may matter more for corporate governance is not share structure but the overall legal framework in which firms can thrive and small investors are given a fair deal. For example, this train of thought would suggest Swedish companies do well not primarily because they have dual-class share structures, but because they are run and regulated by Swedes, with their culture for fair-play and sensible regulation.

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