The Economist

SPECIAL REPORT:

ESG investing

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A broken idea

Investment and sustainability

Three letters that won't save the planet

ESG should be boiled down to one simple measure: emissions

IF YOU ARE the type of person who is loth to invest in firms that pollute the planet, mistreat workers and stuff their boards with cronies, you will no doubt be aware of one of the hottest trends in finance: environmental, social and governance (ESG) investing. It is an attempt to make capitalism work better and deal with the grave threat posed by climate change. It has ballooned in recent years; the titans of investment management claim that more than a third of their assets, or $35trn in total, are monitored through one ESG lens or another. It is on the lips of bosses and officials everywhere.

You might hope that big things would come from this. You would be wrong. Sadly those three letters have morphed into shorthand for hype and controversy. Right-wing American politicians blame a "climate cartel" for soaring prices at the petrol pump. Whistleblowers accuse the industry of "greenwashing" by deceiving its clients. Firms from Goldman Sachs to Deutsche Bank face regulatory probes. As our special report this week concludes, although ESG is often well-meaning it is deeply flawed. It risks setting conflicting goals for firms, fleecing savers and distracting from the vital task of tackling climate change. It is an unholy mess that needs to be ruthlessly streamlined.

The term ESG dates as far back as 2004. The idea is that investors should evaluate firms based not just on their commercial performance but also on their environmental and social record and their governance, typically using numerical scores. Several forces have thrust it into the mainstream. More people want to invest in a way that aligns with their concerns about global warming and injustice. More companies, including a sister firm of *The Economist*, offer ESG analysis. With governments often gridlocked, many people feel business should solve society's problems and serve all stakeholders, including suppliers and workers, not just shareholders. And then there is the self-interest of an asset-management industry never known to look a gift horse in the mouth: selling sustainability products allows it to charge more, easing a long blight of falling fees.

Unfortunately ESG suffers from three fundamental problems. First, because it lumps together a dizzying array of objectives, it provides no coherent guide for investors and firms to make the trade-offs that are inevitable in any society. Elon Musk of Tesla is a corporate-governance nightmare, but by popularising electric cars he is helping tackle climate change. Closing down a coalmining firm is good for the climate but awful for its suppliers and workers. Is it really possible to build vast numbers of wind farms quickly without damaging local ecology? By suggesting that these conflicts do not exist or can be easily resolved, ESG fosters delusion.

The industry's second problem is that it is not being straight about incentives. It claims that good behaviour is more lucrative for firms and investors. In fact, if you can stand the stigma, it is often very profitable for a business to externalise costs, such as pollution, onto society rather than bear them directly. As a result the link between virtue and financial outperformance is suspect. Finally ESG has a measurement problem: the various scoring systems have gaping inconsistencies and are easily gamed. Credit ratings have a 99% correlation across rating agencies. By contrast, ESG ratings tally little more than half the time. Firms can improve their ESG score by selling assets to a different owner who keeps running them just as before.

As investors become wiser to such flim-flam, they are growing more sceptical. This, coupled with turmoil in financial markets, is slowing the influx of money into sustainable funds. It is surely time, then, for a rethink. The first step is to unbundle those three letters: E, S and G. The more targets there are to hit, the less chance of bullseye-ing any of them. Regarding S, in a dynamic, decentralised economy individual firms will make different decisions about their social conduct in the pursuit of long-run profits within the law. Tech firms may appeal to the values of young employees to retain them; firms in declining industries may have to lay people off. There is no one template. The art of management, or G, is too subtle to be captured by box-ticking. Britain's listed firms have an elaborate governance code—and dismal performance.

It is better to focus simply on the E. Yet even that is not precise enough. The environment is an all-encompassing term, including biodiversity, water scarcity and so on. By far the most significant danger is from emissions, particularly those generated by carbon-belching industries. Put simply, the E should stand not for environmental factors, but for emissions alone. Investors and regulators are already pushing to make disclosure by firms of their emissions more uniform and universal. The more standardised they are, the easier it will be to assess which companies are large carbon culprits—and which are doing most to reduce emissions. Fund managers and banks should be better able to track the carbon footprints of their portfolios and whether they shrink over time.

Unsustainable

Better information alone will help in the struggle against global warming. By revealing more accurately which firms pollute, it will help the public understand what really makes a difference to the climate. A growing number of altruistic consumers and investors may choose to favour clean firms even if it costs them financially. And even if they can get away with polluting today, many firms and investors expect that tighter regulation of carbon emissions will eventually come and want to measure their risks and adapt their business models.

Make no mistake, though: tougher government action is essential now. We have long argued for much higher carbon prices that would harness the market to save the planet. Today pricing schemes cover 23% of global emissions, about double the level of five years ago. But far more needs to be done, not least in America (see United States section). It is government action, combined with clear and consistent disclosure, that can save the planet, not an abbreviation that is in danger of standing for exaggerated, superficial guff. ■

In need of a clean-up

The environmental, social and governance (ESG) approach to investment is broken. It needs to be streamlined and stripped of sanctimoniousness, argues Henry Tricks

Desiree Fixler is, in her own words, "no wallflower". When she was hired in 2020 to be head of sustainability at DWS, a German asset manager affiliated to Deutsche Bank, she reckons Asoka Wöhrmann, her boss, must have known the type of person he was taking on. She was a Wall Street veteran. She was battle-hardened, having traded credit derivatives in the run-up to the 2007-09 financial crisis. She had seen the power wielded by regulators. If you pictured somebody who works in sustainability as a soft touch, think again. "I'm hard core, especially when it comes to compliance," Ms Fixler says.

How hard core became clear on May 31st, when 50 German police, investigators and regulators, acting on allegations first aired by Ms Fixler, raided the offices of DWS and Deutsche Bank in Frankfurt. Their focus was on alleged "greenwashing"—the extent to which DWS may have misstated its use of environmental, social and governance (ESG) criteria in its investment portfolio. It cost Mr Wöhrmann his job. It was a chilling moment for big asset managers around the world. And it marked a low point in a year in which ESG has turned from an investment craze attracting trillions of dollars on promises to make the world a better place into a source of eye-rolling cynicism.

DWS and Mr Wöhrmann deny the allegations, which they say have been investigated internally. But whether the authorities find evidence of misbehaviour or not, there is much about DWS's ESG business that is perplexing. So it is with the industry in general. It is the contention of this special report that, from impact to measurement to disclosure, much of ESG is deeply flawed.

The concept's popularity has been partly fuelled by real-world concerns, especially climate change. Yet it has had a negligible impact on carbon emissions, especially by the biggest polluters. Its attempt to address social issues such as workplace diversity is hard to measure. As for governance, the ESG industry does a lousy job of holding itself to account, let alone the companies it is supposed to be stewarding. It makes outsize claims to investors. It puts unmanageable demands on companies.

And yet, for all its pitfalls, it may be better to overhaul than to bin ESG. At its core, it is a quest for something increasingly crucial in the battle to improve capitalism and to mitigate climate change: making firms and their owners accountable for their negative externalities, or the impact of production or consumption of their products on third parties, such as the atmosphere. By forcing businesses to recognise the unintended consequences of many of their activities, the theory is that they should then have a greater incentive to fix them.

The more regulatory pressure there is to make such information more accurate, the better for the long-term future of companies and the world in which they operate. As it is, measurement of the size of the ESG market is confusing, the ratings are too subjective, and the industry over-promises and under-delivers.

Start with measurement. Asset managers have two ways of thinking about ESG. The first is relatively down-to-earth. It is the sale of actively and passively managed funds specifically built around sustainability ratings. In the past two years, these have boomed. Take DWS, for instance. In 2021 it said its dedicated ESG funds had soared to €115bn ($136bn), more than a tenth of its total assets. In the industry at large, Morningstar, a fund tracker, says

ESG assets in mutual funds and exchange-traded funds (ETFS) were almost $2.8trn at the end of the first quarter. That is roughly the size of the cryptocurrency market. But it is still niche compared with global portfolio investment as a whole.

The second way of discussing ESG, however, is ballyhoo verging on baloney. It is called ESG integration, and is the main problem that Ms Fixler claims to have identified at DWS. She says there were no tools in place to measure it. ESG integration means getting portfolio managers in non-ESG funds to use ratings as a risk-management tool, rather as they do to evaluate the dangers of recession or supply-chain disruption. In 2020, when DWS called ESG "the core of everything we do", it claimed that the assets to which it applied ESG integration were worth €459bn, well over half its total €793bn portfolio. That is a whopping amount. Yet a year later DWS scrapped its ESG integration number altogether. It said it was changing its approach to disclosure partly for regulatory reasons. But it also followed what Ms Fixler says was her attempt to draw the attention of the authorities to such nebulous numbers.

Your number's up

DWS's *volte face* suggests that a rethink is needed in the industry at large. Data-gatherers, such as the Global Sustainable Investment Alliance, make eye-popping claims about the size of the ESG market. According to its latest report, sustainable investment in 2020 reached $35.3trn, more than a third of all assets under management in the big economies that it covers. That makes it sound as if ESG is more important to financial markets than it really is. The vast bulk of it (some $25.2trn), comes from ESG integration, which DWS's experience shows may be little more than a finger in the wind. For an industry that prides itself on trying to measure things that are hard to measure, the job it does in measuring itself is hardly confidence-inspiring.

Next look at subjectivity. When Ms Fixler first arrived at DWS, she says one of her surprises was observing that its ESG scoring system, using third-party rating agencies, gave Wirecard, a German payments firm in which DWS funds were big investors, the second-highest rating for governance. At the time, Wirecard was embroiled in an accounting fraud that would shortly lead to its collapse. And Amazon, the e-commerce giant, had DWS's lowest governance rating, she says.

Such apparent contradictions extend to the industry at large. The ESG rating agencies are the veritable acme of inconsistency. A study of six of them found that they used 709 different metrics across 64 categories. Only ten categories were common to all—and they do not include such basics as greenhouse-gas emissions.

Index-providers add to the confusion. In May S&P Dow Jones Indices kicked Tesla out of the ESG version of its S&P 500 index, while keeping oil giants like ExxonMobil in. It noted the electric-vehicle maker's contribution to promoting sustainable transport but gave it short shrift. Instead it penalised Tesla for workplace and governance issues. Elon Musk, Tesla's boss, was not the only person to consider this absurd. Many detect too much toing and froing over complex ethical questions. Arms-makers, shunned by the ESG crowd before the war in Ukraine, are now bemused to find themselves being feted as defenders of democracy. John Gilligan, of Big Issue Invest, a $100m impact fund allied to a social enterprise for the homeless, sums up the subjectivity. "The idea of measuring ESG is like trying to find a measurement for your favourite child," he says.

The third problem is that ESG has become a gravy train for the investment industry. Although it emerged in response to the preferences of investors, especially millennials, to do more with their investments than make money, asset managers have turned this to their advantage. On average, they charge higher fees for ESG-related investments than for non-ESG ones. In marketing, they claim that ESG funds outperform mainstream ones, even if this does not stand up either theoretically or empirically.

On top of all these flaws, ESG has suffered a backlash from those who think that financial elites go too far in pursuit of trendy causes. Right-wing critics of "woke capitalism" see it as a way for sanctimonious CEOs to smuggle in progressive ideas that many dislike, such as phasing out fossil fuels. Those focused on returns, such as Aswath Damodaran of New York University's Stern School of Business, note that ESG metrics failed to discount Russia-based companies before the invasion of Ukraine, further undermining their credibility. Others point to an inherent hypocrisy: for example, ESG ratings measure the risks that climate change pose to a company, rather than the threat the company poses to the climate.

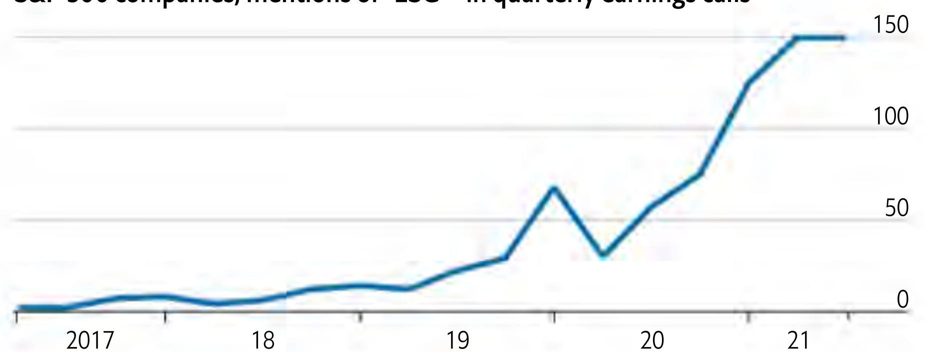
The most salient criticism is that by promoting a second-best solution such as ESG, the private sector may be giving policymakers an excuse to avoid imposing what many see as the best way to respond to climate change: co-ordinated carbon taxes. Yet it is possible to turn this on its head. ESG may be worth preserving precisely because taxes on externalities, such as carbon emissions, have proved so politically hard to push through.

Tighter regulatory oversight of ESG is coming, especially in Europe. In America the Securities and Exchange Commission is hoping to beef up oversight of climate disclosures (though a recent Supreme Court ruling may constrain it.) The hope is that greater supervisory pressure will eventually help capital markets to "internalise externalities"—ie, to reward companies for reducing their carbon footprints through higher asset prices and a lower cost of capital. That means, in the words of Ken Pucker of Tufts University, that it will be necessary to measure less, better. Moreover, Sustainability Inc, as Mr Pucker calls it, will have to jettison the hyperbole that has so harmed its reputation.

The industry, always striving to be upbeat, notes that during the recent market turmoil money has seeped out of ESG funds more slowly than from mainstream ones. Last year, even as DWS faced Ms Fixler's allegations, ESG-related money accounted for 40% of its net inflows. In his speech at the firm's annual general meeting in June, Mr Wöhrmann, after rejecting what he said were unfounded accusations, highlighted those flows. "Our clients have spoken," he said. Such over-confidence epitomises the asset-management industry. ■

Talk, talk

S&P 500 companies, mentions of "ESG"* in quarterly earnings calls



Worldwide ESG* assets under management, 2021, $trn

Source: Bank for International Settlements

*Environmental, social and governance
†Exchange-traded funds

Asset managers

The saviour complex

It's time to get real about what ESG can—and cannot—achieve

FOR ALL the things the sustainability industry tries to measure, it seldom considers its injurious effects on the ear. The field of ESG is replete with enough acronyms and platitudes to tear a hole in the English language. Win-win is only the worst. There are also purpose and profit, values and value—and the list goes on. When people cut through such pieties and liken ESG to a Wild West, where everyone makes their own rules so as to get as much money as possible, it is time to sit up and listen.

A business that started with sandal-clad clerics making ethical investments has been transformed by the world's biggest asset managers, such as BlackRock, State Street Global Advisors and Vanguard, which collectively own more than a fifth of the average firm in the S&P 500. Their actively managed ESG funds remain a small part of overall assets under management. But as Cameron Brandt of EPFR, a firm that tracks fund flows, puts it, net inflows into ESG have been like "pixie dust" to investment funds, helping offset outflows in other parts of their portfolios. And their ability to use ESG criteria to decide how to vote the trillions of dollars of passive funds that they manage adds to the concept's importance.

There are two main drivers behind this focus on ESG. The first, revealed by State Street's bronze statue, "Fearless Girl" , outside the New York Stock Exchange, is that by marketing itself as an environmental and social champion, the investment industry competes to attract the growing wealth of younger savers. Studies suggest that the young like to express their environmental and social preferences through investments (though by no means all are social warriors or tree-huggers). Given that their pensions will accumulate for decades to come, they will also be more exposed to the long-term risks of climate change than older savers.

In search of fees

The second motive is that the sale of ESG products helps asset managers to mitigate the two-decade-old curse of declining fees. A study by Morningstar, a fund-tracking firm, said investors in sustainable funds paid a "greenium" compared with those in mainstream funds. Average annual fees for sustainable funds, albeit modest at 0.61%, were almost 50% higher than for traditional ones. This is clear from a comparison of three BlackRock exchange-traded funds (ETFS), all with similar holdings; the sustainability-linked ones charge higher fees (see box on next page).

In the industry as a whole, the interplay of values-driven marketing with a hunger for high fees raises fears of "greenwashing". The concern is that funds may oversell the extent of their use of ESG purely to attract customers. "We are all grappling with how we manage this tsunami of ESG and make it fair for consumers," says Sacha Sadan, a director at the Financial Conduct Authority, Britain's securities regulator.

So far there have been only sporadic signs of a crackdown on ESG funds. The highest-profile one is the investigation by American and German authorities of DWS, the asset manager owned by Deutsche Bank. In May the Securities and Exchange Commission (SEC) imposed a $1.5m fine on an investment unit of BNY Mellon, a bank, for allegedly misstating ESG information. It was the first time it had reached such a settlement with an investment adviser. In June Goldman Sachs revealed that the SEC had launched an investigation into some ESG equity funds with assets under management of $725m. It said it was co-operating.

It is not clear how far the regulatory crackdown may go. In Europe a bigger upheaval has come via regulatory fiat. According to Morningstar, the region accounts for more than four-fifths of sustainable-fund assets. EU regulators encourage more sustainable investing, and police it more carefully.

Last year the bloc introduced a sustainable-finance disclosure regulation, requiring funds that claim to use ESG to categorise themselves in three ways, depending on their sustainability ambitions. The lowest level, article six, covers mainstream funds. Those with some ESG features, known as article eight, are keen to upgrade to article nine, where ESG is their main objective. Asset managers across the world are eagerly repurposing funds to ensure they meet the article-nine criteria, insiders say.

Yet everywhere concerns about false marketing are growing, and academics, as well as regulators, wish to expose it. A study in May by Aneesh Raghunandan of the London School of Economics and Shiva Rajgopal of Columbia Business School concluded that asset managers did not "walk the talk" when they claimed to be picking stocks that engage in stakeholder-friendly behaviour. Their analysis of American mutual funds between 2010 and 2018 found that companies in ESG investment portfolios violated labour laws, paid more fines and had higher carbon emissions than those in non-ESG portfolios sold by the same institution.

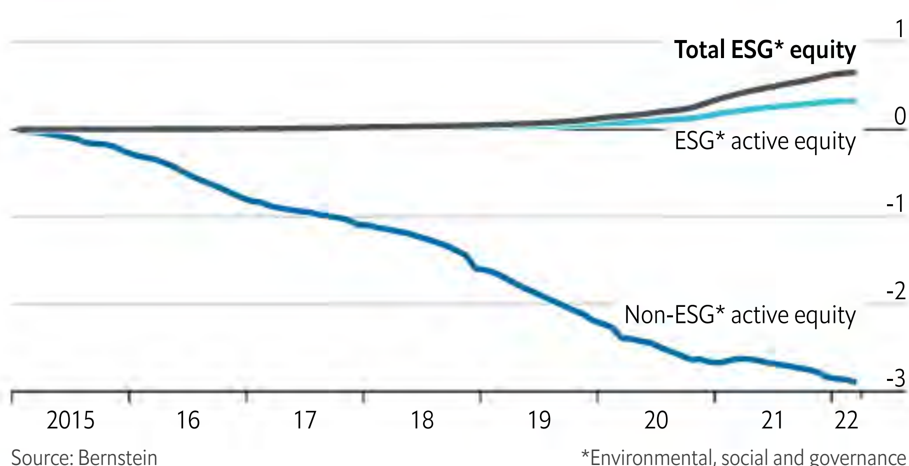
Everywhere concerns about false marketing are growing

Insiders are speaking out. Tariq Fancy, ▸▸

Feeling better

Cumulative flows into equity funds, $trn

Worldwide



Source: Bernstein

*Environmental, social and governance

BlackRock's former chief investment officer for sustainable investing, issued a critique claiming that the profession is little more than "marketing hype, PR spin and disingenuous promises". Some asset managers would dispute this, but others say scrutiny may help bring order to the industry, even if it reduces inflows into ESG funds. "All of this noise is going to hit the pause button," says Suni Harford, president of UBS Asset Management, an early entrant into ESG.

Drill down into different ESG strategies, however, and it is clear that there is room for improvement—so long as enforcers are given sharper teeth to weed out false claims, investors are more aware of the risks they face, and companies strengthen their own ESG-related disclosures. The result may be a smaller universe of funds, more targeted on particular issues, and more credible. "Customisation is coming fast," says Ms Harford.

One area of recent attention is so-called exclusionary funds. These old workhorses of the industry aim to shun such sectors as fossil fuels, tobacco or guns, either for ethical reasons, or because investors hope to shame the industries into behaving better. They are in the spotlight because stocks from some formerly untouchable industries have rallied sharply, partly as a result of the war in Ukraine, encouraging some fund managers to reconsider whether it is right to keep them at arm's length.

This is not just a cynical ploy. There is increasing evidence that divesting from dirty industries simply shunts assets around, creating no net benefit to anyone except those who are happy to hold "sin" stocks. And, as is borne out in a paper by Jonathan Berk, of Stanford Graduate School of Business, and Jules van Binsbergen, of the University of Pennsylvania, it does not meaningfully raise the cost of capital, making it harder for them to do business. A better way to effect change is for socially conscious investors to buy stock and use their proxy votes to influence or even take control of a firm, the academics argue.

That strategy is known as engagement, which Zhihan Ma, head of ESG at Bernstein, an investment firm, calls "the new buzzword". It took centre stage last year when Engine No. 1, an activist hedge fund, won critical support from BlackRock, Vanguard and State Street to help it replace three directors on the board of ExxonMobil to strengthen its response to climate change.

It is not always like this. BlackRock, which supported almost half of environmental and shareholder proposals in 2021, has said it will reduce its backing for them because they are overly prescriptive. Cue a volley of criticism from climate activists, who want BlackRock to use the full extent of its power to force companies to lower emissions. Others, however, claim that stewardship, particularly over trillions of dollars in passive funds, is a dangerous way for asset managers to push their own agendas, rather than those of their clients.

A letter to the SEC in April from 22 law and finance professors, led by Lawrence Cunningham of George Washington University, pointed to studies showing that individual investors do not show the same enthusiasm for ESG as the big institutions. Vivek Ramaswamy, entrepreneur and author, says that the influence of what he calls a "monarchical technocracy" is not felt principally through the ESG funds that they raise. It is the vast number of shares they can vote over their holdings, influenced in turn by their own ESG priorities.

Taking such concerns into politics, 12 Republican senators proposed in May an "Investor Democracy is Expected Act", which would allow individuals to vote their shares rather than Wall Street firms acting on their behalf. It was partly aimed at stemming the ability to stoke what one senator calls "the left's woke agenda in corporate America". Already the industry is taking heed of the political winds. In June BlackRock said that, since October, clients with $120bn of assets had opted to vote

How to charge more

Fees for managing ESG funds tend to be higher than for non-ESG ones

IT CAN BE hard to tell the difference between exchange-traded funds (ETFS) with an ESG focus and those without one. Take three iShares ETFS all managed by BlackRock: the Core S&P 500 (IVV), which has no ESG focus; the ESG Screened S&P 500 (XVV); and the ESG Aware MSCI USA (ESGU). The top equity holdings in all three funds are Apple, Microsoft, Amazon, Alphabet A & C shares and Tesla. Their biggest sectoral exposures are to tech, health care, financial services and consumer goods. Two of the three have ExxonMobil, an oil giant, as one of their top 20 holdings. IVV also has exposure to "sin" stocks, such as arms and tobacco firms, but they are a tiny fraction of its overall portfolio. All three funds have performed pretty much in lockstep this year: down by a little over 20%.

Where they differ most strikingly is in the level of their fees. For all three, these are lower than at actively managed mutual funds. But fees for XVV are almost three times those for the non-ESG fund; for ESGU they are five times as high. The obvious inference from this is that even low-fee index funds can charge more for ESG funds than for non-ESG funds. There are, however, two big caveats. One is that the core S&P 500 fund is ten times the size of ESGU and over 1,000 times that of the screened one. Its sheer scale may help it charge lower fees. And ESG index funds, though passive, also require more work to construct than plain vanilla ones. Like all things ESG-related, the truth is never simple.

Dear and dearer

Selected BlackRock exchange-traded funds

June 30th 2022

	Returns since Jan 1st 2022, %	Net assets $bn	Expense ratio, %
Core S&P 500	-21.0	280	0.03
ESG Screened S&P 500	-23.2	0.21	0.08
ESG Aware MSCI USA	-22.6	21	0.15

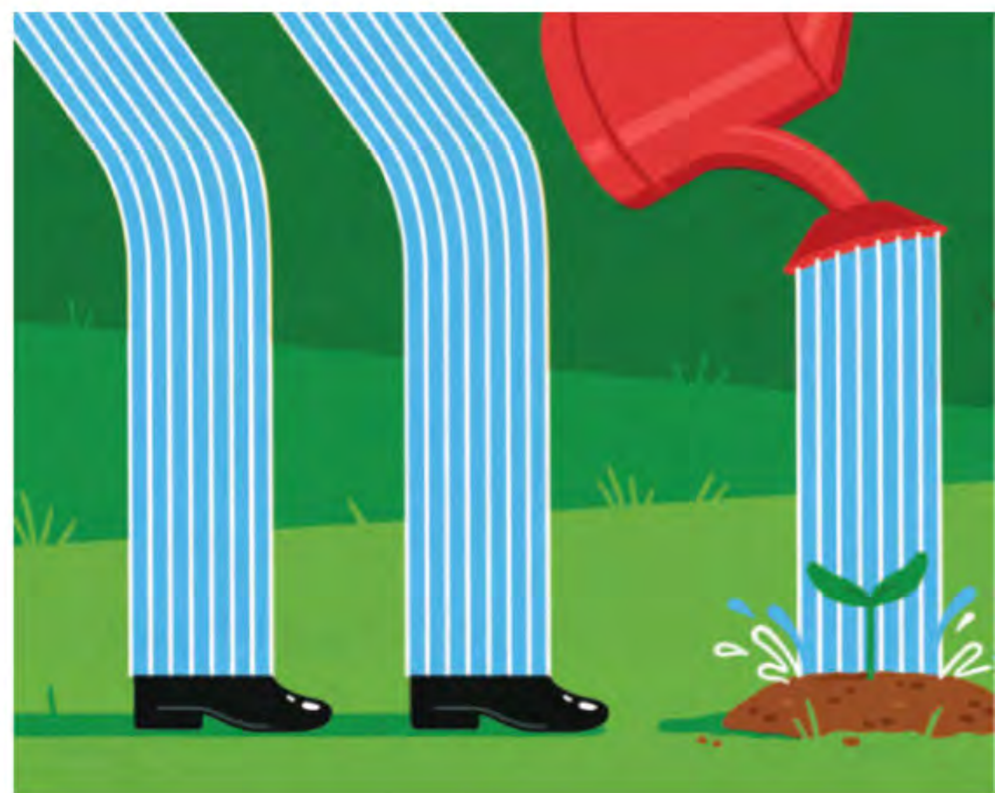
Source: Company reports

their own shares, taking the number up to $530bn, or 25% of its passive equity funds. Mostly this is institutional money, but it wants individuals to express voting preferences too.

For those keen to ensure that ESG investment is not just box-ticking, more funds are available that offer returns which are more than financial, such as life-saving water, health and sanitation projects in poor countries. The average value of assets under management at such "impact funds" was around $100m in 2020, says the Global Impact Investing Network. This is enough to attract big private-equity funds, such as KKR. The International Finance Corp, a unit of the World Bank, says that under its strictest definition of impact investment, or "measured impact", there were $636bn of total assets in 2020, 45% of which came from private equity. But as the amount grows, fears of "impact washing" grow too. As with ESG in general, it needs monitoring.

How quickly the universe of ESG will expand depends partly on how much investors' appetite for adventure may suffer from higher interest rates and seemingly greater market turbulence. Paul Bodnar and Eric Van Nostrand of BlackRock insist that the firm's "bottom line" when it comes to sustainability funds remains their investment performance. They also say that, although many ESG funds have underperformed recently, especially those weighted against fossil fuels, this is a healthy reminder that returns can go down as well as up.

In the long run, changing investor preferences and the energy transition should mean that ESG funds outperform, Mr Bodnar and Mr Van Nostrand predict. "Let's not confuse the short-term volatility for the long-term outperformance that is the principal basis for our focus in this space," Mr Van Nostrand says. That claim of outperformance, though, is increasingly controversial. ■



Investors

The warm glow

It's a myth that ESG investments inevitably outperform. You can't have it all

DAVID BLOOD proudly holds up on a Webex screen a framed *Economist* article written in 2004 when the former Goldman Sachs banker, together with Al Gore, a former American vice-president, set up a new investment firm, Generation Investment Management. It includes the inevitable quip about men named Blood and Gore launching a sustainable-investing business. But he is keener to point out the title, "Does it add value?" He says: "This may be your question today."

A lot has happened in 18 years. When the firm started, some of Mr Blood's former colleagues thought the idea was "completely nutty". Now sustainability has moved into the mainstream. But he retains two beliefs. First, long-term investing is best-practice, sustainability improves economies, and ESG is a useful tool to understand business and management. Second, ESG is hard. "When somebody tells you it's always a win-win, they're not being truthful. Very often there are trade-offs." So he welcomes the increased attention on the asset-management industry's misuse of language, inconsistent data and greenwashing. And he is right that the biggest question remains: does it add value?

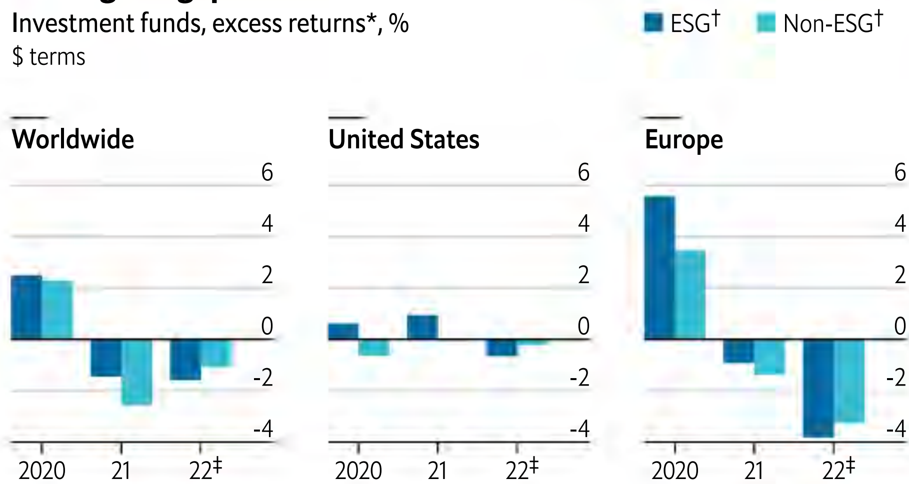
It has been easy recently to say yes, not least since ESG funds broadly defined have outperformed the non-ESG sort in America and Europe since 2010. However, part of the outperformance was because ESG funds invested heavily in growth stocks, such as big tech. Rising interest rates and war in Ukraine have hit such firms hard this year. Though the energy crisis has exposed the need for more renewables, especially in Europe, this year returns from fossil fuels and other old-economy stocks have outperformed those in clean energy. Sin stocks have made out like bandits.

In reality, returns depend on how ESG is measured. As Alex Edmans of London Business School points out, some strategies pay off over long time horizons, but others do not, especially if they are not material to a company's core business. This focus on materiality is important. In an *Institutional Investor* article in 2019, "Where ESG fails", some of sustainability's strongest advocates from Harvard Business School (HBS) made what looked like a heretical admission that companies rated highly on an array of ESG metrics did not in fact produce better shareholder returns. But they offset this by reprising a paper, co-written by HBS's George Serafiem in 2015, which showed that when companies focused their sustainability efforts on ESG issues material to the bottom line they outperformed impressively.

Linking ESG to materiality makes intuitive sense. An energy company's carbon footprint is more material to its business than a bank's. The first is more likely to look at emissions from an economic perspective than a social one, encouraging it to manage them better. Yet the conclusion remains controversial. In a paper this year, Luca Berchicci of Erasmus University Rotterdam and Andrew King of Boston University recrunched the numbers from the 2016 materiality study and found them to be a "statistical artefact". Mr King says this stands to reason. Efficient-markets theory suggests that excess returns are always hard to find, especially when information is widely available.

No free lunch

Others have challenged the underlying idea that virtue could ever be a free lunch. In 2017 Cliff Asness, boss of AQR, a hedge fund, noted that investors in a portfolio that shuns sin stocks should not expect to do as well as those that have no such restrictions. That should be the whole point of ESG, he suggested. By selling out of sinful companies, virtuous investors push share prices down, which offers buyers the prospect of higher returns—even though driving up polluting companies' cost of capital should make it harder for them to make money. "Frankly, it sucks that the virtuous have to accept a lower expected return to do good, and perhaps



Source: Bernstein *Relative to benchmark indices †Environmental, social and governance ‡To May 31st

sucks even more that they have to accept the sinful getting a higher one. Well, embrace the suck as without it there is…no good deed done at all," he said.

More recently Aswath Damodaran of New York University's Stern School of Business has come to a similar view when assessing whether ESG bolsters corporate profits. He says that it may be true that "bad" companies face higher funding costs, but points to scant evidence that good ESG firms generate higher income or growth. He draws attention to the causation problem: do successful firms embrace ESG or does ESG make firms successful? When it comes to outperformance, he says the best idea is to get ahead of the curve and jump on stocks that show potential for improvement. Wait too long and the effect will become priced in.

Some argue that it is rewarding to scour emerging markets for "ESG improvers". Companies that turn their performance around are an indicator of management quality. If investors want to have a positive impact, it is better to back a dirty company that can be influenced to cut its carbon emissions than one that already has a negligible carbon footprint and so scores highly on ESG. Even if ESG does not guarantee bumper returns, there are other ways to attract investors. One is through risk-adjusted returns. If investors have long time horizons, it makes sense to have risk-management mechanisms to screen companies for problems like climate change, regulatory or reputational damage.

Another is to give investors the "warm glow" of doing good by not obsessing over short-term returns. This may be more applicable to younger than to older investors. A study in 2019 by New York Life Investments found that investors aged 25-39 were most likely to want to consider climate change in their portfolios, whereas those aged 55 and over focused more on data fraud and theft. Lukasz Pomorski of AQR says the desire to do good applies even in the world of hedge funds, where he sees many investors now looking for ESG strategies. AGR recently transformed some funds into ESG ones, but it first sought investors' blessing. It made clear the switch could hurt returns. "Most said 'just do it'," he says.

S.P. Kothari of MIT Sloan School of Management agrees that people passionate about climate and other causes may want to promote them through their investments. But he notes that even if some put their preferences before profit, there is a limit to how far they will go. He recalls a case in 2018 when Jason Perez, a police sergeant in Corona, California, became fed up with the pro-ESG stance of CalPERS, America's biggest public pension fund. Its returns were having a financial impact on him, his family and public servants at large. He campaigned for a CalPERS board seat, won and ousted its sustainability guru. ESG "all sounds good until it starts to bite your bottom line," concluded Mr Kothari. ■

Companies

Internalising the externalities

Can firms be made accountable for their carbon emissions?

Stretching as far back as the Middle Ages, businessmen have tried to build up fabulous wealth then save their souls by giving much of it away. Francesco Datini, the 14th-century "Merchant of Prato" left behind hundreds of thousands of business and personal letters, ledgers and documents showing how he had made his fortune trading arms, spices and wine. As James O'Toole, a retired professor of business ethics, writes in his book "The Enlightened Capitalists", they showed Datini to be an "astute, shrewd, ambitious, ruthless and greedy entrepreneur…filled throughout his life with constant anxiety". But his cares got the better of him and before his death he left a fortune to endow a foundation for the benefit of the poor of Prato. It still exists over 600 years later.

Mr O'Toole chronicles many pioneers who set out to make business about more than just money, from Robert Owen, who turned his textile factory in Manchester into an experiment in worker development, via Anita Roddick, whose Body Shop became a symbol of eco-friendliness in the 1980s, to Ben Cohen of Ben and Jerry's ice cream. His conclusion is that however successful such ventures can be under their founders, it is hard to keep the missionary zeal going—especially if they become publicly traded entities. Investors seldom have the patience to stick with a commitment to virtue. "*Difficile est bonum esse,*" he writes.

Yet do-goodery has become all the rage. That is most obvious from the embrace of stakeholder capitalism, which redefines corporate success as serving not just shareholders but employees, suppliers and the wider community. Led by Jamie Dimon, the JPMorgan Chase CEO who chaired the Business Roundtable, a lobby group, when it embraced the concept in 2019, company bosses have used their commitment to social causes to speak out on issues ranging from racial inclusion to gay rights to climate change.

Sometimes, as when Disney protested against Florida's "Don't say gay" bill, enraging the state's governor, Ron DeSantis, this can stir a backlash that is not good for the bottom line. But it has become mainstream enough that Alex Edmans, of London Business School, is incorporating stakeholder capitalism into the next edition of "Principles of Corporate Finance", a bible for financial practitioners. As he acknowledges in his book "Grow The Pie", it is not as radical a departure as its advocates suggest. Milton Friedman, the economist often criticised for preaching shareholder primacy, argued that the social responsibility of business was to reward owners by increasing profits. But if those shareholders wanted the company to have a more social purpose, so be it.

ESG is often mixed up with stakeholderism—but there is another way to think about it. Part of its mission is to measure and disclose things that firms and their customers turn a blind eye to. The list includes the impact of commercial activities on the atmosphere, oceans, air, water and biodiversity, which are supposedly available to all but can be overexploited privately at high social cost. In strict ESG terms, the aim is not altruistic. It is rather a way of assessing the regulatory or reputational risks that arise from "negative externalities". A company may also be

Company bosses have used their commitment to social causes to speak out

expected to gauge how seriously at risk it is from climate-change related events, such as extreme weather.

The measurements themselves, provided they are standardised and trustworthy, may be useful to everyone. Measuring carbon emissions is critical for tackling climate change, either as a basis for carbon taxes, or for regulatory efforts to rein in emissions, or for giving investors the opportunity to create a "shadow carbon price", in which high emitters are penalised by the markets. Better data make it clearer who is genuinely cutting emissions and who is not.

Measure for measure

The measurements are not easy, though. Companies may report greenhouse-gas emissions in their annual and sustainability reports, as well as to non-financial standard-setters such as the Global Reporting Initiative (GRI), a standards group. But as Eelco van der Enden, GRI's boss, sardonically points out: "What gets measured gets managed. But what gets measured also gets manipulated." That makes it a continuous challenge to improve data quality.

The most straightforward emissions are those from a company's day-to-day operations, called scope one, and those from its energy suppliers, such as electricity companies (scope two). Yet even among listed firms, these are not widely available. The research arm of MSCI, an index provider, says that of almost 10,000 firms in its world index, less than 40% reported scope-one and -two emissions. The share is likely to be smaller among private and state-owned firms, especially in emerging markets where many emissions are generated.

Even trickier is the measurement of scope-three emissions, which cover an entire supply chain, from extraction of raw materials through suppliers to end users, and account for as much as 90% of emissions in some industries. Supplier data may be hard to find. Consumer data may depend on estimates. Responsibilities may overlap: should an oil company be blamed for emissions when its fuel is burned in a petrol tank, or should the car company—or both? MSCI says less than a quarter of its constituents report scope-three data, and that the quality is poor. In a recent report, CDP, a data-tracking firm, found that only 55% of European oil and gas companies released scope-three information, even though it accounts for the vast bulk of their carbon footprint.

Mandatory regulation of such disclosures, especially those material to a company's business, should tighten things up. But misgivings about the quality of disclosures have given rise to a new trend. Companies, under pressure from investors and lenders, are increasingly making commitments to science-based and net-zero targets, which aim to keep global warming within the 1.5-2.0°C limit of the 2015 Paris agreement, but do so over medium- and long-term time horizons. At last count, 1,503 firms had science-based targets, and 1,194 had net-zero ones, including parts of Coca-Cola and General Motors.

The biggest pressure is on heavy industry, mining, energy and transport firms. Climate Action 100+, a pressure group formed by 700 investment funds, aims to ensure that 166 of the world's biggest greenhouse-gas emitters align with the Paris targets. It said this year that 69% of them were committed to reach net zero by 2050 or sooner. However, only 17% had set medium-term targets or produced quantified decarbonisation strategies. Almost two-thirds of oil and gas companies are still pursuing projects inconsistent with limiting global warming below 2°C, it noted.

Such commitments sound like a burden on companies. Investors appear not to take them seriously because it is rare that a company's net-zero commitment has an impact on its share price. But they may serve other purposes. Good behaviour, so long as it is in service to a robust business model, may attract a higher calibre of employees and board members, and a good sustainability record may let a company charge more for its products. It may even attract funding. Besides the interest of ESG investors in the capital markets, banks are under pressure to target lower emissions in their loan portfolios.

Target setting is not without its flaws, however. The danger, as London Business School's Mr Edmans puts it, is that "You hit the target and miss the point." He gives an example of an electric-vehicle company with low carbon emissions, but a nasty footprint through lithium-mining.

The ideal would be to price negative externalities. Carbon taxes are indeed on the rise. As of the end of 2021, more than a fifth of global emissions were covered by carbon pricing, though at levels too low to cause meaningful changes in behaviour. Amir Amel-Zadeh of Oxford University says that better disclosure should help "internalise the externalities". The next question is: can the arbiters of disclosure, ESG rating agencies, bring enough order to the chaos to influence investment flows? ■

Rating agencies

The signal and the noise

Measurement of ESG data needs a big overhaul

When Michael Jantzi, founder of Sustainalytics, an ESG research firm, started analysing the responsible-investing field in 1990, it was a "curiosity, to put it nicely", he says. To start with, there were "a lot of lean years". But the ball got rolling with the collapse of Enron, an energy giant, in 2001. Along with other corporate scandals, it gave rise to the Sarbanes-Oxley act, passed in 2002, which overhauled audit and financial reporting for public companies, boosting the G side of what is now ESG.

Growing concerns about climate change and rising inequality after the 2007-09 financial crisis have increased demand for data on the E and S sides as well. ESG rating companies, which have grown to as many as 160 worldwide, have begun to consolidate. In ▸▸

2020 Sustainalytics became wholly owned by Morningstar, the fund-tracker firm. It now rates 14,000 companies globally.

The idea behind ESG ratings is to measure how exposed a company is to non-financial risks, and drive its share price and cost of capital accordingly, forcing laggards to shape up—or go out of business. But a lack of reliability, comparability and transparency in what is being measured produce too much noise to provide accurate signals. The title of a recent paper on divergent ESG ratings by Florian Berg, Julian Kölbel and Roberto Rigobon, from MIT Sloan School of Management, sums it up. It is "Aggregate Confusion". There are plenty of other criticisms of the business, and not only from the likes of Elon Musk (Tesla's impact report of 2021 opens with a blistering attack on ESG rating methodologies, calling them "fundamentally flawed" because they do not assess the scope of positive impact on the world, but only "the dollar value of risk/return").

The International Organisation of Securities Commissions (IOSCO), a regulatory body, says there is little clarity on what ESG raters intend to measure and what their methodologies are. It asks whether they suffer conflicts of interest by providing consulting services to companies they rate, and whether they incorporate developing as well as developed-country firms. It notes that the market is largely unregulated. Securities supervisors such as the EU's European Securities and Markets Authority hope to change that.

ESG raters sometimes like to seem like credit-rating agencies, which have a long (albeit chequered) history. But there are differences. The biggest is in the disparity of their ratings. Whereas the credit-rating arms of Moody's, S&P Global and others produce results that are close to 99% correlated, ESG scores produced by them and other firms such as Sustainalytics and MSCI tally barely more than 50% of the time.

The "Aggregate Confusion" paper spells out how ratings differ in what it calls scope, measurement and weightings. On scope, one rating agency may include corporate-lobbying activities, but another may not. They measure differently, with one assessing labour practices based on employee turnover, and another counting the labour-related court cases against the firm. And they assign different weights to their ESG scores, such as putting more emphasis on labour practices rather than lobbying.

For now, regulators put most attention on how the firms rate environmental practices. The OECD club of mostly rich countries found that some ESG rating agencies put less emphasis on E than the other two bits of ESG, so that investing in companies with high ESG scores does not necessarily imply they are managing carbon emissions well. It noted companies with high ESG scores also frequently had high emissions. Moreover, it found that the mere act of disclosing well-crafted climate strategies determines the E score more than the quality of interim targets or the steps actually taken to reach them.

Asset managers say that for all the misgivings about E scores, they are more trustworthy than S ones, which many would like to exclude. One talks of them dismissively as "extra-curricular activities". Another says that in some countries, such as France, too much data-mining on workers may violate privacy laws. He adds that some rating firms push the ethical boundaries by seeking out employee data on social-media sites such as LinkedIn.

Thus numerous flaws exist in ESG ratings. And though the rating firms object to the idea that regulators may force them to harmonise what they measure, they also know that there is room for improvement, especially to make ratings more forward-looking. "The last 10-15 years have been about the impact of environmental and social issues on a portfolio. The next ten years will be as much about the impact of investment on the environment," says Mr Jantzi. Conveniently, that is the direction that regulators want to take the ESG market as well. ■

The regulators

Missionary creep

New disclosure rules aim to better measure climate risks. Is that even possible?

FROM THE outside, the Wilmington Club, a brownstone mansion in Wilmington, Delaware, looks like a place where time has stood still. It sits in an overgrown garden. The front door and windows let no light out from within. Step inside and the feeling is amplified: it is like entering a refuge from woke capitalism. At the bar are heavy ashtrays. A stag's head is on the wall. A black-and-white photo celebrates the 105 whiskies ordered at a legendary dinner many years ago. Until recently, says Charles Elson, a corporate-governance expert formerly at the University of Delaware, terrapins were bred in the basement to be turned into stew.

In short, it is a convivial place for corporate lawyers in a city where the law is almost everyone's bread and butter. Some 1.6m businesses are incorporated in Delaware, and cases decided in Wilmington quickly become the law of the land. But lately the club's lawyers have been in as much of a stew as the terrapins. That is because ESG threatens to replace the state's long-established influence over American business with the long arm of government.

Mr Elson says the creep of federalism into the boardroom started with the Sarbanes-Oxley act in 2002. Then came the Dodd-Frank act of 2010, which mandated reporting on executive pay. Now comes an ESG-related proposal from the Securities and Exchange Commission (SEC) to force companies to disclose climate-related information. As Myron Steele, former chief justice of the state's supreme court puts it, "Strictly from the Delaware perspective, the only thing worse than nuclear war is a federal mandate for corporate governance."

The business of risk

It is not only American regulators. The International Sustainability Standards Board (ISSB), a newly created arm of the IFRS Foundation, aims to make non-financial disclosures as consistent as financial ones in a company's filings. The European Union is pushing for another set of standards, the corporate-sustainability reporting directive, to become law in its 27 member countries by the end of this year. It is expected to force as many as 49,000 companies who do business within the bloc to reveal sustainability information, up from 11,600 now. S.P. Kothari of the MIT Sloan School of Management half-jokingly describes the global push as a "full-employment act for accountants and consultants."

Two forces are driving things forward. The first is a sense among regulatory bodies that climate change is too big a risk to the financial system to deal with under the old rules. As Luiz Awazu Pereira da Silva, deputy general manager of the Bank for International Settlements (BIS), the central bankers' bank, puts it, financial markets are aware of the risks of climate change, but the current pricing of those risks is too low, as if global warming can be reversed by some miracle technology. "It's not a tail risk. It is something that is certain to occur if we don't do something about it."

Climate change is too big a risk to the financial system to deal with under the old rules

The second is a strong conviction that shareholders want more information. "What's changed is that investors have become much more interested in seeing the

full picture," says Sue Lloyd, vice-chair of the ISSB. Gary Gensler, chair of the SEC, launched the climate-disclosure proposals in March saying that they had the support of investors "representing literally tens of trillions of dollars".

The transatlantic disclosure proposals are not identical. Both the ISSB and the SEC are proposing climate disclosures, though the ISSB also has proposals for more general disclosures. Ms Lloyd says its main aim is to give investors the sustainability information that they need to make an assessment of a company's value. She describes the current situation as confusing for both companies and investors, because firms do not know what information to make available, and shareholders struggle to make sense of a plethora of data. In one of the most difficult areas, the ISSB is seeking feedback on how companies should report greenhouse-gas (GHG) emissions, including the so-called scope-three emissions generated by suppliers and users of their products. Disclosure will depend on how material such emissions are when assessing a company's value, she says.

Regulatory ambitions

The SEC's proposed rule is 490 pages long and hugely ambitious. In a nutshell, it aims to mandate: disclosure on climate-related risks to a firm's current and future business; information on any scenario plans or internal carbon prices it uses; the threat of climate-related events such as bad weather on each item in its financial statements; its GHG emissions, including scope three, if material or part of an emissions goal; and details on other climate-related targets and whether it is meeting them. If it is a big firm, these disclosures will need to be audited.

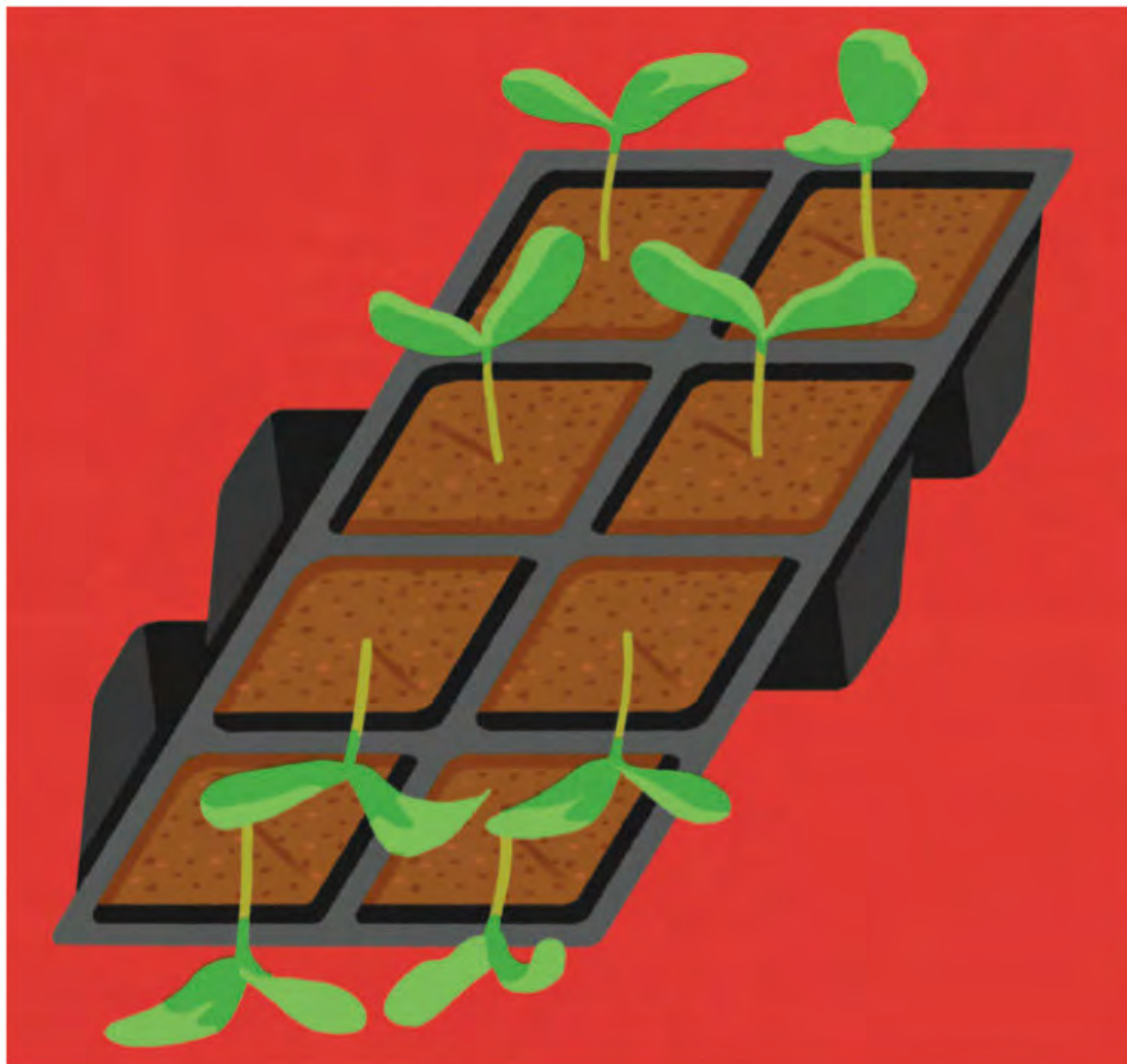
The EU's rules go beyond referring to information about climate change that is material for investors and aim to measure the company's impact on people and the environment directly. This "double materiality" has given rise to what Ms Lloyd calls "a bit of an emotional debate" about whether other regulators go far enough. But she thinks it is a red herring. The perspectives do not have to be in conflict and there is commonality in the information required. For example, when a high-emitting company assesses its GHG emissions, it will have to gauge their impact on the outside world because of the risk that a regulatory, consumer or worker backlash will affect its value, she says.

Yet if in Europe the concern is that the new rules may not go far enough, in America it is that they may exceed the SEC's remit and threaten to damage the credibility of the entire financial-reporting system. That has led to some colourful dissent. Hester Peirce, the only SEC commissioner to oppose the new proposals, set the tone by declaring in March: "We are not the Securities and Environment Commission—at least not yet." She complains that some disclosure rules will affect companies whether their emissions are material or not. She says measuring climate risks is difficult to do, and that trying to drive capital flows to the right firms is a "fool's errand" because nobody knows what effective climate solutions will emerge.

The criticisms do not stop with her. In May the *Wall Street Journal* reported that the cost of implementing the proposals was becoming a concern. It said the SEC's own estimates were that it would raise the cost to businesses to comply with the rules from $3.9bn a year to $10.2bn. There are also criticisms that the SEC has listened too much to big asset managers, who reap fees from selling ESG products, rather than to retail investors, who may be less keen on all the new information.

Perhaps most tangibly, critics foresee a backlash from both sides of the political divide: from the right, on the grounds that it thinks Wall Street asset managers are pushing a political agenda in the name of their clients; and from the left, where many think fighting climate change is more important than fussing about financial risks. Among the lawyers in Wilmington, the betting is that the courts will stop the SEC in its tracks because its disclosure rules flout the limits to its authority. This view has been bolstered by a Supreme Court decision at the end of June to curb the power of the Environmental Protection Agency, an American regulator. It could provide legal grounds for fighting the SEC on climate-related risks and GHG emissions.

For the rules to have global impact, though, America needs to play a part. The whole point of putting forward overlapping climate-related disclosures from the ISSB, the SEC and the EU is that they limit the burden of repetition on reporting companies, and spread the costs. As for their impact, granular and more standardised climate-risk disclosures could give investors a better handle on where the risks and opportunities lie. This could eventually help determine the risks affecting the value that they put on a company. As Mr Pereira da Silva of the BIS says, such signals could help to set a "shadow price" on carbon emissions even in the ab-



sence of a government-mandated carbon price.

The information would have to be trustworthy. That is why so many accounting firms are hiring feverishly as the gravy train approaches. PWC, one of the big four, said last year that it would spend $12bn creating 100,000 jobs, a fair portion of which will be working on ESG-related issues. It is also raising the skill levels of its existing staff to help handle these matters. Alan McGill, a sustainability expert at PWC in Britain, gives a sense of the mission-driven zeal that the mandatory reporting now plays into. "Every six weeks that passes is 1% of the decade gone, so the time to act is disappearing," he says.

Whether fearmongering helps is open to debate. Whether it is even possible accurately to forecast the financial impact of something as unprecedented as the future effects of climate change also remains to be seen. But for all the misgivings, it is hard to see this regulatory juggernaut stopping in its tracks. It may be better to think of how the rules can be finessed to give investors better information not just about the future of the companies they own, but also how to mitigate their impact on the planet. ■

The future of ESG

Measure less, but better

It's the environment, stupid

LAST YEAR Vivek Ramaswamy, a health-care entrepreneur, published "Woke Inc", a rollicking polemic against the passion of American CEOs to pat themselves on the back for tackling such issues as climate change, racism and workers' rights. He argued that, however fractured governments are, such problems are the job of politicians to fix. In the hands of business elites, a concept like ESG might be well-intentioned. But it threatens to subvert the integrity of democracy, Mr Ramaswamy suggested.

Other critics of ESG make a similar point about carbon taxes. They say that offering a feel-good alternative to investors, financiers, big business and regulators, aka, "the climate-industrial complex", may give an excuse to governments not to charge for carbon emissions. It is a legitimate concern. Carbon taxes would be the best way to direct investment to the most promising decarbonising technologies. Yet nobody should be fooled. The main reason the taxes are both low and insufficiently co-ordinated across the world is not because of ESG or woke capitalism. It is because politicians are too timid to foist them on voters.

In fact it is worth doubling down on private-sector and bureaucratic efforts to get companies to measure and reduce their carbon emissions. It may be a second-best solution. But with the right disclosure requirements and regulatory scrutiny, it could help direct capital where it is best needed. And if governments ever muster up the courage to beef up carbon levies, good measurement would make them more effective.

As this special report has argued, ESG has too often been neither a good measurement tool nor an effective risk-management one. It aims to satisfy so many stakeholders that the information it elicits often bears little relevance to what a company actually does. It is too imprecise to be a shadow tax on a company's negative externalities. It has created confusion for companies. And it is hard for investors to work out what it means for asset prices.

Moreover, it is infected with moral judgments that change with the weather. As researchers at the University of North Carolina's Kenan-Flagler Business School have pointed out, ESG measurement is mixed up with diametrically opposed views on the purpose of the company, as well as debates over whether shareholders or stakeholders should prevail in decision-making. That amplifies arguments over what is a "good" or "bad" company.

In contrast, the profit-and-loss accounting system that it aims to supplement is a model of clarity, eschewing moral judgments and political influence. Accounting boards have shown the value of standardised, audited financial statements for the development of capital markets, economic growth and as checks on the way managers run companies. Sustainability disclosures should try to follow a similar path.

To make ESG measurement more effective it must be streamlined. Standard-setters should not impose measurements to satisfy every interest group or asset manager's pet social cause. Instead, they should try to ensure that non-financial disclosures are required only if they are material to an industry. Measures of more general relevance can be disclosed voluntarily, as they are via the Global Reporting Initiative.

The asset-management industry should customise its offerings. It should make products better tailored to particular investor constituencies: climate funds for people who want to reduce carbon emissions, social funds for those interested in human capital; and governance funds for those worried about mismanagement. If it wants to sell products that put sustainability ahead of all other considerations, they should be marketed as "impact" funds, without reckless promises of high returns. If investment managers persist in introducing ESG criteria across the span of their portfolios, they should surrender voting rights to ordinary shareholders to make them more representative. That should steer them away from dangerous forays into the culture wars.

Streamlining need not mean shrinkage. In fact, more focused metrics could be promoted globally to encompass private companies and government entities, especially in emerging markets which have the most to do in cutting carbon emissions. It may be better to focus on the E side of ESG, and not the S or the G. In many non-Anglo-Saxon countries, there are impediments to basing investment decisions on the latter two, given information controls. Regulators, including the SEC, are for now focused exclusively on climate-related disclosures.

Ideally, the term ESG should be scrapped. As an amalgam of three words, environmental, social and governance, which sound more like a pious mantra than a force for change, its reputation is now tarnished. That may worsen if outflows continue as returns deteriorate. Yet sustainable investing is not about to disappear. More regulation may make it more credible. So would more policing of net-zero commitments. Investors will continue to care not just about returns but about the world they live in. With a suitable new name—say, natural-capital investing—there is no reason why a blend of climate and capitalism should not prove useful. Provided it is not hyped far beyond what it can actually achieve. ■

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