BANK OF ENGLAND

Speech

From hot air to cold hard facts: how financial markets are finally getting a grip on how to price climate risk and return – and what needs to happen next

Speech given by

Andrew Hauser, Executive Director, Markets

Investment Association, London

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Introduction

2020 is not the likeliest of years for the green revolution to have started paying off in financial markets. With a global pandemic raging, and economic uncertainty at historic highs, issuers, investors and intermediaries might have been forgiven for having their minds elsewhere.

But, in fact, after many years of rhetoric from market practitioners, the temperature has changed noticeably. Hot air is turning into cold hard fact:

- Climate oriented equity indices have outperformed the broader market by 2-5% in 2020, as economic activity has shifted away from travel and other fossil fuel-intensive sectors, and towards online commerce and technology (Chart 1);

- Green bonds also outperformed their conventional counterparts over that same period (Chart 2), and made up a fifth of total European investment grade issuance in September alone. And companies such as VW and Daimler secured material reductions in financing costs (or 'greeniums') when issuing their first green bonds, linked to the development of low-emission technologies;

- Governments have been increasingly persuaded of the powerful direct and indirect effects of issuing their own 'sovereign green bonds' too, with a raft of countries coming to market for the first time this year: Germany's innovative dual-bond issuance was five times oversubscribed and commanded a clear greenium; and the European Commission announced that it will fund 30% of its €750bn 'Next Generation' budget in the same way;[1]

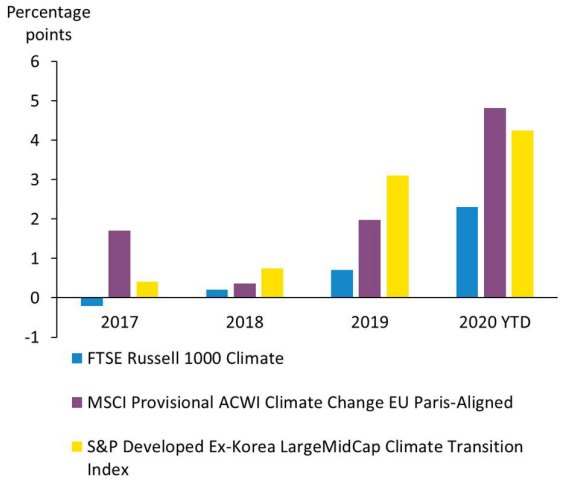
- More and more investment money is massing on the sidelines. Funds with above-average sustainability ratings have seen big inflows this year, and now hold $4.6 trillion in assets globally. In response, fund managers are overhauling their investment strategies to put sustainability centre stage.[2] To take just one example, more than 500 global investors, accounting for over $47 trillion of assets, have committed to support the Climate Action 100+ initiative, aimed at ensuring the world's largest corporate greenhouse gas emitters take action on climate change.[3]

For the many organisations, including the Bank of England, that have pushed so hard for climate economics to be taken seriously, these are welcome developments, especially in the runup to next year's UN Climate Change Conference, 'COP26'. But, on a moment's reflection, the fact that this is happening now is less surprising. Covid-19 reminds us all that we cannot ignore the daunting forces of the natural world. And it is accelerating economic trends that had previously been slow to reveal themselves. Those trends bring many challenges – but they also bring opportunity, amongst them the chance to advance the pace of climate transition.

[1] https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1657
[2] See eg https://www.blackrock.com/corporate/investor-relations/larry-fink-ceo-letter
[3] http://www.climateaction100.org/

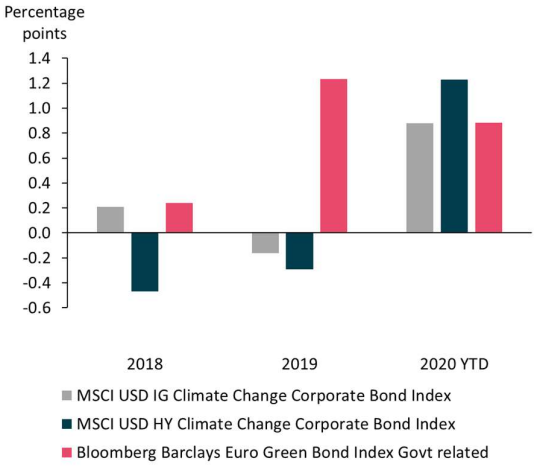
The need to do so is pressing. The UN Environment Programme estimates that global greenhouse gas emissions must be cut by 7.6% in each and every year from now until 2030 to meet a 1.5°C temperature goal.[4] To put that number in context, it's roughly the decrease the International Energy Agency expects to see this year as a result of Covid-19.[5] Repeating that reduction every year for a decade is hard to comprehend. It will certainly require huge investment, estimated to be at least $3.5 trillion per annum, for the foreseeable future.[6] That's a doubling in capital spending in the power sector alone.

Chart 1: Excess returns of green equity indices vs relevant market-wide benchmark



Source: FTSE Russell, MSCI, S&P Dow Jones Indices and Bank calculations.

Chart 2: Excess returns of green bond indices vs relevant market-wide benchmark



Source: MSCI, Bloomberg Finance L.P. and Bank calculations.

Funding those massive sums will fall, in part, to governments around the world, and in part to the banking system. A lot has been said about the challenges that will pose. But increasingly the task will also fall to the capital markets – and that's where I want to focus my remarks today.

Well-functioning capital markets are amongst the most powerful tools we have for turning the vision of a resilient carbon neutral economy into reality.[7] Cold hard price incentives that reward investments aligned with that goal, and penalise those which aren't, are worth a thousand entreaties on the dangers of inaction.

Establishing those incentives requires three key building blocks. First, **credible public metrics** of the climate impact of specific investment projects and corporate activities, and the financial risk and return involved. Second, **effective capital market instruments** to package that risk and return and match it with

[4] https://www.unenvironment.org/news-and-stories/press-release/cut-global-emissions-76-percent-every-year-next-decade-meet-15degc
[5] https://www.iea.org/reports/global-energy-review-2020/global-energy-and-co2-emissions-in-2020
[6] See eg https://www.irena.org/financeinvestment/Investment-Needs, https://www.fca.org.uk/publication/corporate/climate-financial-risk-forum-guide-2020-innovation-chapter.pdf and https://www.iea.org/news/deep-energy-transformation-needed-by-2050-to-limit-rise-in-global-temperature
[7] Indeed, a recent paper by Ralph De Haas and Alexander Popov (https://www.ecb.europa.eu/pub/economic-research/resbull/2019/html/ecb.rb191127~79fa1d3b70.en.html) argues that capital markets (and in particular equity markets) may be superior to banks in incentivising climate-supporting investment.

growing investor demand. And third, **asset allocation strategies** allowing those investors to construct portfolios aligned with, and facilitating, the transition to a carbon neutral economy.

For much of the past decade, those three building blocks have been slow to develop, or vulnerable to charges of 'greenwashing' (projects, vehicles or investment strategies that are 'green' in name only). I want first to review why that historical performance has been so sluggish, before turning to look at how things are changing, and fast, under the influences of shifting public policy and consumer behaviour, and the physical realities of a changing planet. I will focus mainly on developments in private financial markets, but will also touch on some of the ways that we in the UK public sector can contribute, as market participants in our own right.

Why markets have struggled to price climate risk: externalities, horizons and opacity

Given the sheer scale of the climate challenge, it is at first glance surprising that financial markets have struggled to reflect it in asset pricing. The reasons for that failure are threefold.

First, it is in the nature of climate change that many of the costs of failing to address it, and the opportunities for positive change, fall to society as a whole, rather than specific individuals or companies. The freedom to emit unlimited amounts of carbon is one example. Markets are notoriously poor at pricing such 'externalities'.

Not all climate risks are externalities, of course. Investor activism can bring consequences to bear on firms viewed to be responsible for climate harm.[8] And climate-related natural disasters – already three times more frequent than 40 years ago – fall on real individuals and real companies. Financial markets and institutions can help provide insurance against those risks, but great care is needed to ensure such cover is provided appropriately: too little, and households, companies and lenders will go under-covered; too much, and insurers may be unable to follow through on their commitments.[9]

But the most important force for internalising these externalities will be public policy – on climate regulation, carbon pricing and taxing, and legal liability. Such policy 'privatises' the social cost on specific companies and sectors of the economy, and creates powerful opportunities for those first to innovate climate-positive technologies. I will not have more to say on the priorities for future policy in this area today,[10] but it is safe to say that these steps will only intensify as governments follow through on the sort of mid-century net-zero commitments legislated in law by the UK last year, and recently by China.

The second factor impeding financial market pricing of climate risk has been the long horizon over which that risk has historically been thought likely to crystallise. Financial markets do not have a great track record pricing such longer-term phenomena, particularly when their scale and incidence is also uncertain – a failing

[8] To take just one example amongst many, 'Make My Money Matter' was formed by Richard Curtis and Jo Corlett to drive change in pension fund investment: https://makemymoneymatter.co.uk/.
[9] For a recent discussion of these issues, see https://www.bankofengland.co.uk/speech/2020/anna-sweeney-moodys-the-resilience-of-insurers-in-a-changing-climate
[10] For a recent central banker's perspective on these points, including the case for establishing a global price for carbon, see the speech by Isabel Schnabel of the ECB at https://www.ecb.europa.eu/press/key/date/2020/html/ecb.sp200928_1~268b0b672f.en.html

that Mark Carney has called the 'tragedy of the horizon'.[11] But here, too, things are changing. Climate risk doesn't seem so hypothetical or far off to those gazing at red skies over San Francisco, fleeing their burning homes in the Australian outback, baling out flooded villages in the UK, or contemplating big writedowns in the value of their businesses (as the boards of Ford, VW, BP and Shell, to name but a few, have done). Here, a combination of consumer action, government policy, and financial market pricing are bringing the future into the present.

The final issue is the most prosaic, but perhaps also the most important from a financial markets perspective – and that is the historic absence of robust measurement. Measurement of how much pollution specific companies, their supply chains and consumer markets, produce. And measurement of the extent, and efficacy, of remedial action. While financial performance and risk is measured, and audited, to the nth degree, climate risk has historically been a void. What isn't measured can't be priced, traded or risk managed. This is perhaps where change has been most profound, as I will discuss shortly.

The consequences of the historic failure of financial markets to price climate risk have been two fold. Much of the focus has been on the under-pricing of downside risk – to polluters, or polluted – and the potential for a 'climate Minsky moment': a sudden sharp downwards adjustment when that risk crystallises. But opportunities to improve climate outcomes have been under-priced too: making it harder to get the finance needed to drive positive change. Both sides of this equation need to change – and they are.

The building blocks of change

In what follows I want to cover those three key building blocks for an effective capital markets infrastructure that I mentioned at the start: climate **disclosure**; climate-linked **capital instruments**; and climate-focused **asset allocation strategies**.

But before doing so I will note an irony – which is that the very need to have climate-specific tools reveals the immaturity of financial markets' relationship with climate risk. In a world where climate risks were fully internalised, measured, priced and traded, there would be little need for dedicated climate financial infrastructure: climate risk would be factored into each and every risk and reward decision. Green bonds would just be bonds. And 'impact investors' could focus their efforts on other challenges, as market pricing would align the private and societal costs associated with greenhouse gas emissions. That 'integrated approach' is a worthy goal: the Holy Grail of market maturity. But we are some way from that today.

Building block 1: climate disclosure

The field of climate disclosure is as good an example of that gap as any. No-one needs to convince public companies of the merits of regular disclosure of their financial risks and returns: their economic health depends on it; and, just in case that's not enough, it's compulsory.

[11] https://www.bankofengland.co.uk/speech/2015/breaking-the-tragedy-of-the-horizon-climate-change-and-financial-stability

The incentives to disclose climate risks and returns may seem somewhat less hard-edged. Much of the early discourse on disclosure has certainly been aimed at encouraging firms to adopt such disclosures voluntarily. But that is changing rapidly.

Companies at the sharp end have increasingly strong business incentives to disclose, some of which I've tried to summarise in Table 1. Robust climate metrics not only help with managing your own investment programme, they also signal clearly to your retail and business customers, and your employees, that you 'get it' and have coherent plans to address the risks over time. Doing so buys customer commitment and brand image, and helps your supply chain; failing to do so risks customer boycotts, lost contracts and poor investment planning.

Something similar is afoot in capital markets too. Disclosing your plans can improve your credit rating, broaden your investor base, reduce your cost of finance, and economise on the fixed costs of meeting increasingly vocal investor requests for information. A recent large-scale study of some 6,000 corporate disclosures found that firms that published data on their Environmental, Social, and Governance (ESG) performance received cheaper debt funding, with environmental disclosures having the largest effect.[12] And increasingly that message is getting across: three-quarters of UK board members believe structured disclosure along the lines of that recommended by the Task Force on Climate-Related Financial Disclosures (TCFD) will increase brand value, nearly half expect improved alignment with shareholder priorities, and a third already see tangible financial benefits.[13]

Table 1: Potential economic benefits of disclosing climate metrics (and costs of not)

		Potential issuer benefits from disclosing	**Potential issuer costs from not disclosing**
Financing terms and asset valuations	**Credit rating**	Improved rating	Worse rating
	Lower uncertainty risk premium	Higher asset valuations	Lower asset valuations
	Size of investor base	Access to more investors	Shrinking investor base
	Financing rate	Cheaper finance	More expensive finance as raters/investors apply a risk premium
	Fixed cost of investor engagement	Lower cost of engaging with investors	Confusion drives increasing costs of investor engagement

[12] https://www.researchgate.net/publication/335016621_ESG_practices_and_the_cost_of_debt_Evidence_from_EU_countries
[13] https://www.carbontrust.com/news-and-events/news/two-thirds-of-major-uk-companies-to-incorporate-climate-change-risks-and

Business management	**Management of own risks**	Improved understanding and ability to manage risks	Weaker awareness internally and externally
	Retail consumer expectations / demand	Improved brand image and hence demand / revenues	Customer boycotts harm firms' positions in contested markets
	Supply chain expectations / demand	Awarded more contracts from firms seeking lower 'Scope 3' scores[14]	Cut out of contracts from firms seeking lower 'Scope 3' scores
	Human resources	Attracting, motivating, and retaining staff	Challenges in hiring and retaining key staff
Regulation	**Regulatory compliance**	Clean regulatory record	Fines and infractions

That's all very well for firms with a good story to tell – but doesn't it still pay laggards to stay silent? Increasingly not. Where firms fail to provide their own authoritative disclosures, customers, investors and rating agencies will attempt to construct their own. And that's not good for your financial health: because disagreement between different measures of a firm's climate performance, whether driven by poor data or otherwise, increases equity risk premia, and hence the cost of raising investment finance.[15] It increases the overhead from dealing with investor queries or resolutions on ESG issues, which have risen this year despite the Covid-19 pandemic.[16] And it will leave you scrambling when disclosure becomes mandatory. The FCA is already consulting on proposals that firms listed in the UK will be expected to make a TCFD disclosure.[17] And the EU Taxonomy Regulation will make green revenue and expenditure disclosures obligatory for those falling within its jurisdiction. Setting out pathways to mandatory TCFD disclosures should be a priority for public authorities; in the UK this is being explored by the Government-led taskforce on climate disclosure.[18]

If that gives the case for disclosure in principle, what makes a good disclosure from the perspective of effective capital markets functioning? According to the TCFD, disclosures should be: consistent (complete, and comparable across time and issuers); 'decision useful' (relevant to investment decisions, specific, reliable, verifiable); and forward looking (showing not just where you have been, but where you are going, and how).[19]

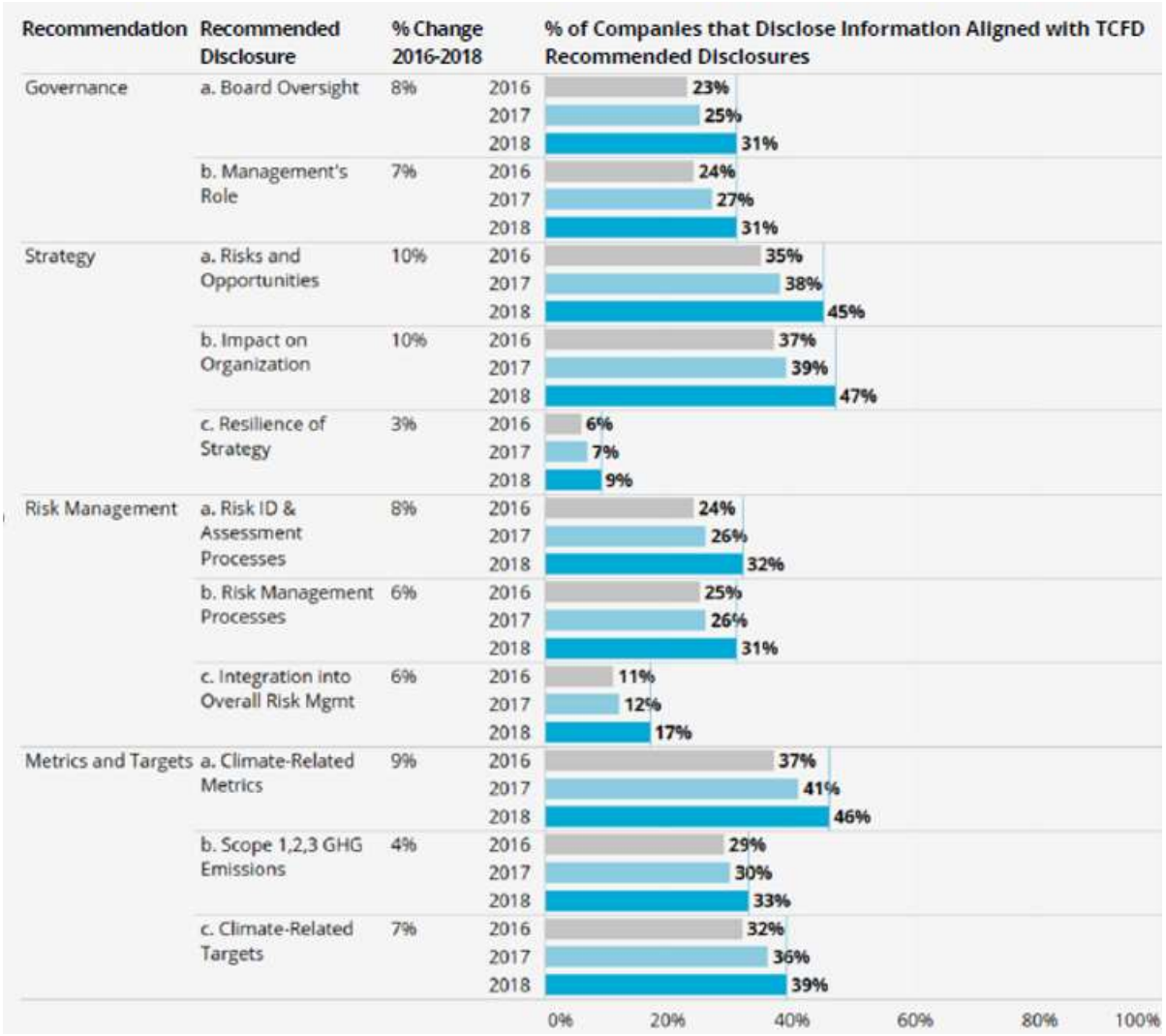
[14] The Greenhouse Gas Protocol Corporate Standard classifies a company's emissions into: Scope 1 (direct emissions from owned or controlled sources); Scope 2 (indirect emissions from generation of purchased energy); and Scope 3 (all other indirect emissions in the upstream and downstream value chain of the reporting company).
[15] https://www.inrate.com/cm_data/ESG_Rating_Disagreement_and_Stock_Returns.pdf
[16] According to https://citigatedewerogerson.com/wp-content/uploads/2020/10/IR-SURVEY-2020.pdf, 79% of firms report a rise in ESG investor queries in 2020; and https://shareaction.org/fossil-fuels/resolutions-tracker/ suggests a pickup in shareholder resolutions on climate change.
[17] https://www.fca.org.uk/news/press-releases/fca-announces-proposals-improve-climate-related-disclosures-listed-companies
[18] https://www.bankofengland.co.uk/-/media/boe/files/speech/2020/leading-the-change-climate-action-in-the-financial-sector-speech-by-sarah-breeden.pdf?la=en&hash=A76529EC3930769B0D6FA8FECBFF0507BE6DBBA3
[19] https://www.tcfdhub.org/recommendations/

Consistency – the first of those criteria – has been a challenge. The TCFD is widely recognised as the right overarching framework: nearly half of large companies globally were already disclosing TCFD-aligned metrics at the time of the last comprehensive survey in 2019 (Chart 3), and support for the TCFD had grown to over 1,440 organisations by September this year, with a market capitalisation of over $12.6 trillion. But at the next level of detail – the standards giving specific guidance on what should be disclosed and how – there are at least five approaches to choose from: the Carbon Disclosure Project (CDP), the Climate Disclosure Standards Board (CDRB), the Global Reporting Initiative (GRI), the International Integrated Reporting Council (IIRC) and the Sustainability Accounting Standards Board (SASB). And the raw data disclosed under these approaches are being packaged by third-party providers into a daunting variety of summary statistics, the correlation between which can be low or zero, even when they purport to measure identical concepts (Chart 4).

Such diversity can be helpful in driving innovation. But fragmentation of standards is no basis for a viable global capital market for climate risk. In recognition of that fact, the 'group of five' framework producers,[20] the 'big four' accounting firms[21] and the International Financial Reporting Standards Foundation[22] have all recently announced initiatives to deliver a single harmonised set of metrics that could be commonly adopted and reported alongside other core financial information. These are positive developments – but given the importance of consistent climate disclosures, further definitive convergence is needed, and soon.

[20] https://impactmanagementproject.com/structured-network/statement-of-intent-to-work-together-towards-comprehensive-corporate-reporting/
[21] http://www3.weforum.org/docs/WEF_IBC_Measuring_Stakeholder_Capitalism_Report_2020.pdf
[22] https://www.ifrs.org/news-and-events/2020/09/ifrs-foundation-trustees-consult-on-global-approach-to-sustainability-reporting/

Chart 3: TCFD-aligned disclosures[23]



The second TCFD criterion is that good metrics should be 'decision useful'. From a business management perspective, this point is obvious: to be useful in shaping strategy, a metric has to be something with a direct influence on investment decisions. And from a financial markets perspective, it has to be relevant to understanding risk and return. A lack of meaningful, consistent metrics makes it hard, or impossible, for investors to construct viable portfolios by comparing climate performance across firms. And that, in turn, dampens the incentive of those firms to improve and disclose their climate performance in the first place.

[23] https://www.fsb-tcfd.org/wp-content/uploads/2019/06/2019-TCFD-Status-Report-FINAL-053119.pdf

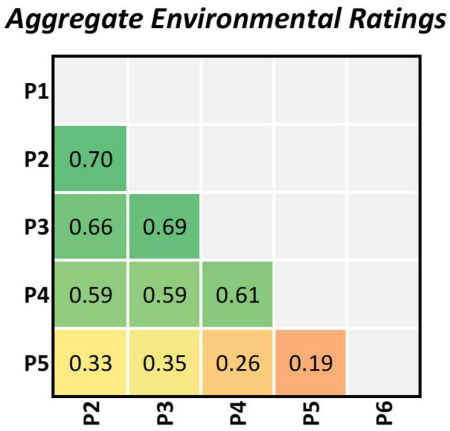
Chart 4: Correlations between environmental scores from different rating providers[24]

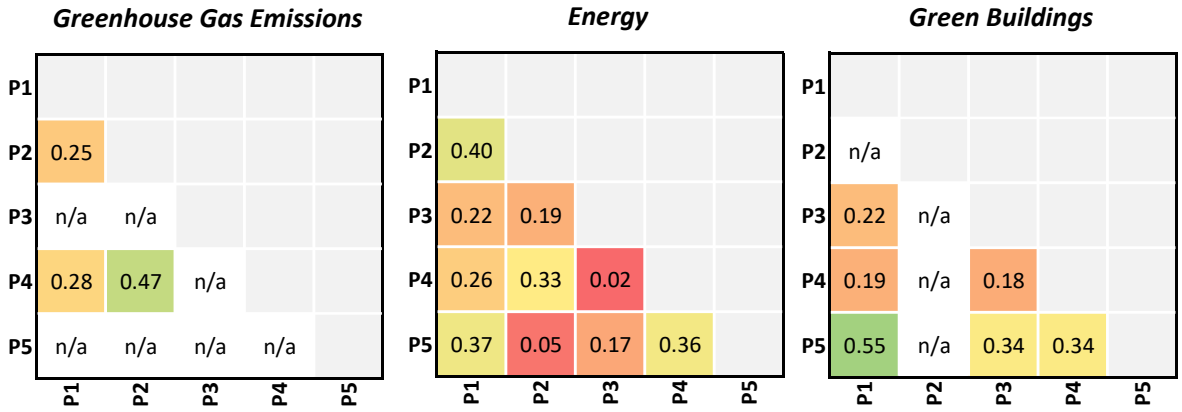
Key

Each matrix displays correlation coefficients between Environmental ratings given by five rating providers (labelled P1 – P5 in the charts) on a sample of 924 firms (2017 data).

Right: Correlation coefficients between aggregate Environmental ratings.

Below: Correlation coefficients between ratings of a selection of more granular environmental categories.





A key decision for investors is whether to make use of the raw climate data disclosed by firms, or packaged summary measures from ratings providers, such as those illustrated in Chart 4. Summary measures have obvious attractions, since they delegate to specialists the daunting task of data gathering, analysis, gap-filling and aggregation. But in so doing they also risk injecting further inconsistencies: fully half of the variation in the aggregate ratings shown at the top of Chart 4 reflects decisions on the composition or weighting of those aggregate measures, as opposed to variations in how firms' raw disclosures are measured. A recent paper from the Bank of Italy suggests that investors can construct better-performing portfolios by combining the raw data themselves.[25]

The final TCFD criterion is that disclosures should be forward looking. This is particularly important for capital markets, because a climate asset's value will be determined far more by where it is going, than by where it has been. Faced with the choice between assets from two companies, one with relatively low current emissions but no investment plans, and another with relatively higher current emissions but aggressive and credible future plans to lower them, an asset allocation strategy based exclusively on current

[24] Results drawn from https://mitsloan.mit.edu/ideas-made-to-matter/why-esg-ratings-vary-so-widely-and-what-you-can-do-about-it
[25] https://www.researchgate.net/publication/342550204_Mind_the_gap_Machine_learning_ESG_metrics_and_sustainable_investment

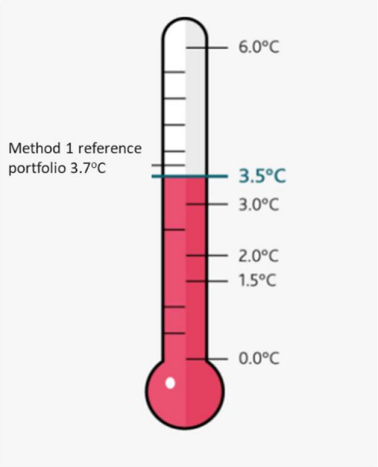
metrics would not only underperform an alternative strategy that takes account of forward looking information, it would also risk failing to fund the very investments needed to tackle climate change. The biggest rewards will fall to those who are first to spot a heavy polluting company on its way to becoming credibly green.

Forward looking disclosures can take many forms. At the highest level, they may set out issuers' climate targets, and their chosen strategies for meeting them. They may give specific descriptions of investment projects. Or they may involve model-based projections of future performance. We at the Bank of England showed one such measure, of 'portfolio warming potential', when we published the first full disclosure of the climate risks on our own balance sheet earlier this year.[26] The measure, based on the provider's emissions projections for each issuer with corporate bonds held in the Bank's Asset Purchase Facility (APF), suggested that if those projections were representative of the emissions performance of corporates globally, the world would experience 3.5 degrees of warming by end-century (Chart 5).

So far, so dramatic. But similar measures based on alternative forecast assumptions for the same portfolio suggested a much wider range of possible outcomes, from <1.75 to 4 degrees: a huge variation given the consequences of missing a 2 degree warming target (Chart 6). The problem stems in part from different assumptions about how the world will evolve and how different industries will need to react. For a given temperature goal, investors need to know how much carbon can be emitted, over what timeframe, and by whom, in order to assess where companies sit relative to their required trajectory. Detailed and standardised reference scenarios are needed for this kind of assessment, such as those being developed by the Network of Central Banks and Supervisors for Greening the Financial system.[27]

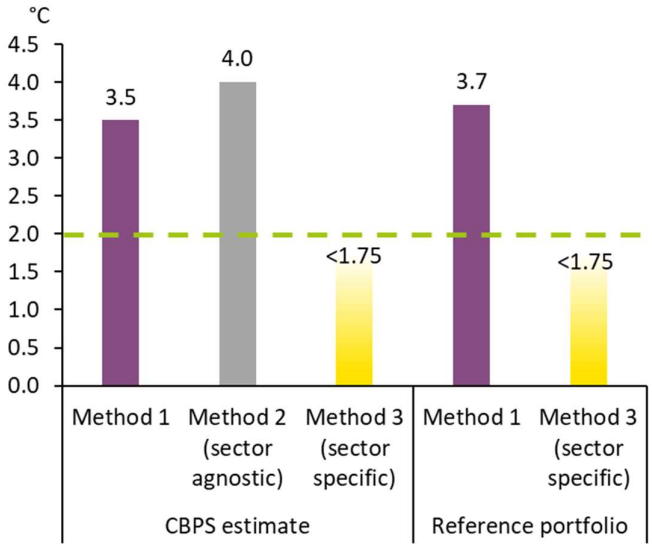
[26] https://www.bankofengland.co.uk/-/media/boe/files/annual-report/2020/climate-related-financial-disclosure-report-2019-20.pdf
[27] https://www.ngfs.net/sites/default/files/medias/documents/820184_ngfs_scenarios_final_version_v6.pdf

Chart 5: Estimate of APF corporate holdings 'portfolio warming potential'



Source: see footnote 26.

Chart 6: Alternative warming potential metrics for same portfolio



Source: see footnote 26.

Building block 2: capital instruments

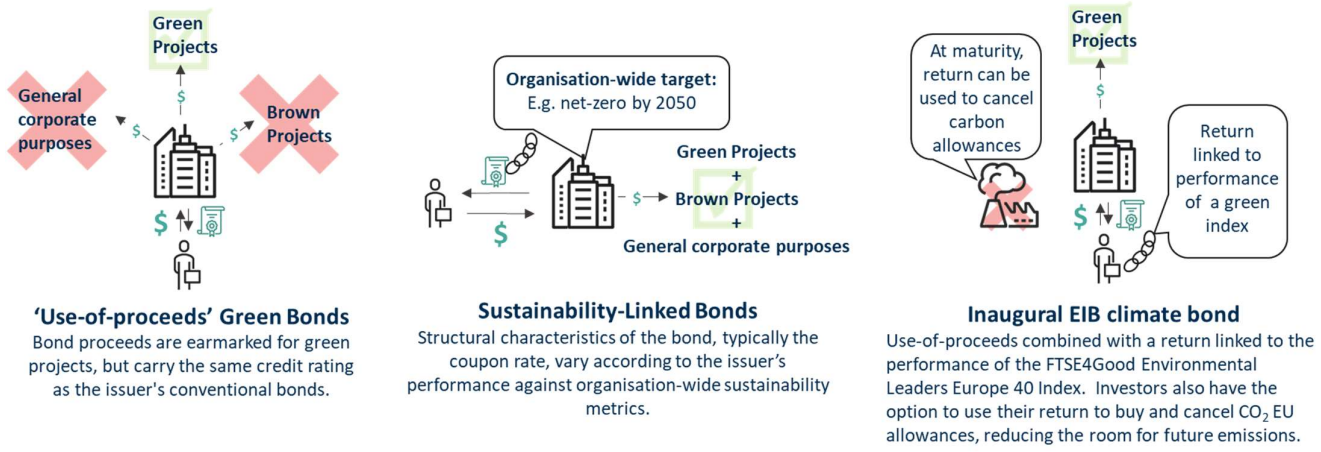
The second key building block for an effective capital markets infrastructure for trading climate risk is a set of viable capital instruments. As I mentioned earlier, it is not clear a separate climate asset class is needed in steady state: dedicated 'IT investment bonds' or 'physical buildings equity' are for example pretty rare! But climate-linked instruments can be very helpful on the transition path, to give focus to the need for change, help meet specific investor needs, and provide a credible 'put your money where your mouth is' commitment from issuers to deliver on specific projects until more robust and consistent decision useful metrics can be developed.

A wide variety of new climate-linked markets have begun or are under discussion, including for example Voluntary Carbon Offsets,[28] derivatives products to manage risks in renewable energy[29] or green mortgage-backed securities.[30] But I want to focus my remarks today on the most prominent example: that of climate-linked, or 'green' bonds.

[28] See in particular the recently launched Task Force on Scaling Voluntary Carbon Markets: https://www.iif.com/tsvcm/Main-Page/Publications/ID/4061/Private-Sector-Voluntary-Carbon-Markets-Taskforce-Established-to-Help-Meet-Climate-Goals
[29] See discussion in the CFTC's report on Managing Climate Risks in the U.S. Financial System: https://www.cftc.gov/PressRoom/PressReleases/8234-20
[30] Fannie Mae is currently the world's largest issuer of green MBS: https://multifamily.fanniemae.com/media/8616/display

Green bonds come in different flavours, illustrated in Chart 7. The dominant model is the 'use of proceeds' bond, designed to raise funds for specific earmarked investment projects that the issuer sees as climate-positive. This earmarking, coupled with regular reporting on project progress, provides debt investors with targeted transparency on the credentials of the projects their funds are supporting. The first such bond, issued in 2007 by the European Investment Bank, coupled the use of proceeds structure with a number of other innovative features, and other supranationals and government agencies helped develop the market further in subsequent years. But the concept only really took off after the agreement of the Green Bond Principles in 2014, which established market-wide standards of transparency, disclosure and reporting.[31] There are now approaching $1 trillion of such bonds across a wide range of issuers (Chart 8) – and, while that stock is so far just a tiny fraction of the $120 trillion global corporate bond market,[32] green issuance is growing several times more rapidly than conventional bonds. UK companies currently lie well down the issuance league table (Chart 9), and have primarily issued in euros (Chart 10).

Chart 7: A selection of 'green bond' structures

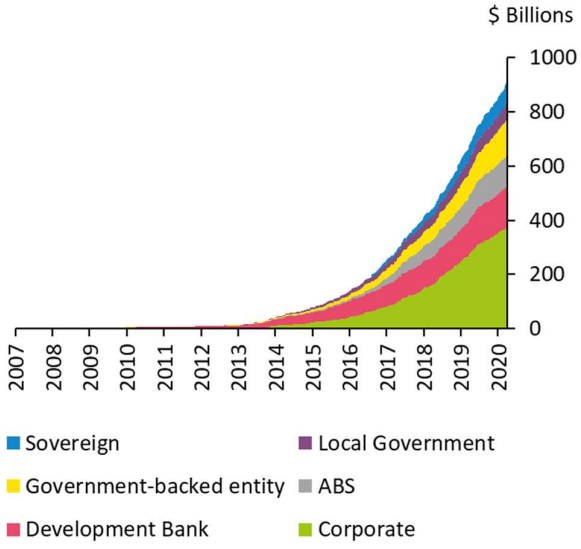


One concern sometimes expressed with this first generation of green bonds is that there are no binding requirements as to what constitutes a green project, and hence bonds may sometimes be labelled green on spurious grounds.[33] There have been various attempts to address this issue, for instance the Climate Bonds Initiative's Taxonomy and Certification Scheme[34] and the European Union's Green Bond Standard[35], which set out more robust scientific criteria for identifying projects which genuinely help with climate change. The model also requires an issuer to have fairly sizeable green capital expenditures in order to issue a bond liquid enough to appeal to mainstream investors.

[31] https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/Green-Bonds-Principles-June-2018-270520.pdf
[32] BIS Quarterly Review, September 2020
[33] Consistent with this, researchers have so far failed to identify a near-term relationship between green bond issuance and subsequent reductions in carbon emissions (https://www.bis.org/publ/qtrpdf/r_qt2009c.htm) – though there clearly are many possible reasons for this result, not all of which suggest greenwashing.
[34] https://www.climatebonds.net/standard/taxonomy
[35] https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-green-bond-standard_en

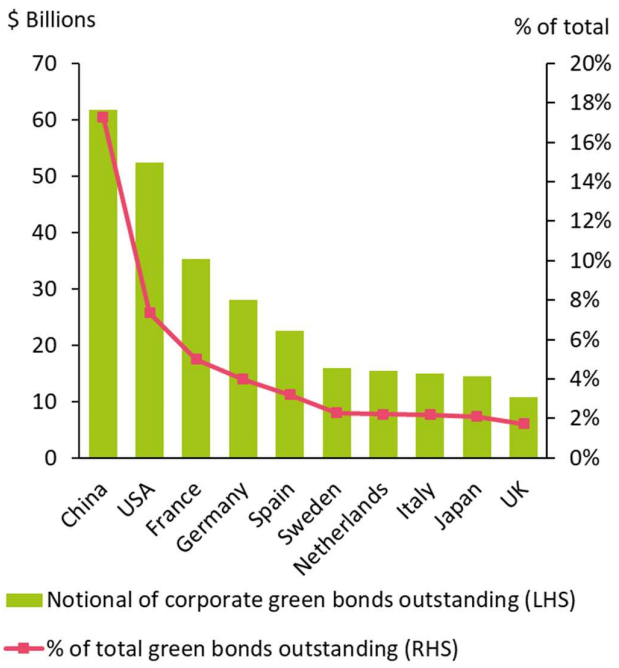
An alternative approach is to link some element of the financial return on the bond to the achievement by the issuer of a particular climate sustainability outcome, without linking the bond to specific green expenditures. The first such 'sustainability-linked bond' was issued by Enel, an Italian electricity producer, and offered a 'step up' coupon penalising the issuer if it failed to meet a specific target for the share of renewable energy in its installed capacity. Such bonds are not a complete answer to the concern of greenwashing: the degree of challenge in the target remains the choice of the issuer, for example, and the use of funds cannot be traced to specific projects in the same way as use of proceeds bonds. But they do illustrate the type of innovation now underway in capital markets.

Chart 8: Total green bond issuance



Source: Climate Bonds Initiative (CBI) data (including all self-labelled green bonds aligned with CBI's Climate Bonds Taxonomy and with at least 95% use of proceeds financing or refinancing green/environmental projects) and Bank calculations.

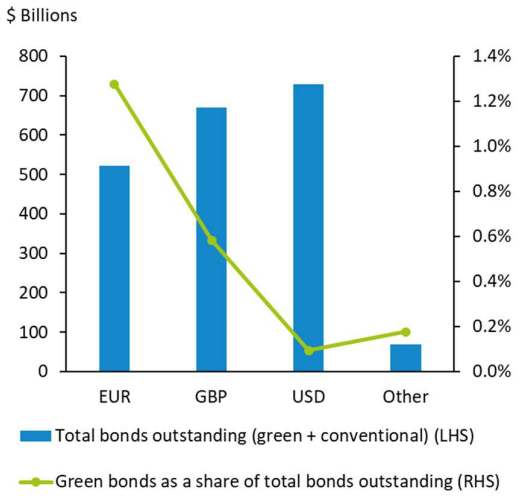
Chart 9: Corporate green bonds outstanding by nationality of issuer



Source: CBI data and Bank calculations.

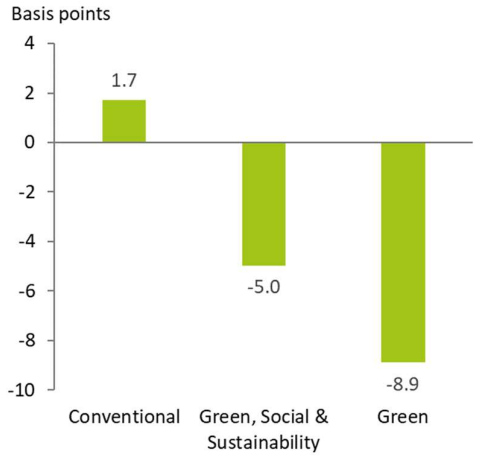
The billion dollar question, of course, is whether the market is yet discriminating in favour of climate-positive investment, and away from the reverse. There are some encouraging signs from recent primary issuance: green bonds issued by European companies in September priced on average nearly 10 basis points inside existing curves, and tighter than other non-green issuance over the same time period (Chart 11). That's real money: for example, the average -15bp new issue premium on VW's recent €2bn green bond issues will save the firm around €3mn a year in interest costs compared to a conventional bond. Evidence of a persistent 'greenium' in secondary market pricing is however more mixed.

Chart 10: Currency composition of bonds by UK domiciled issuers (excluding gilts)



Source: CBI, Bloomberg Finance L.P. and Bank calculations

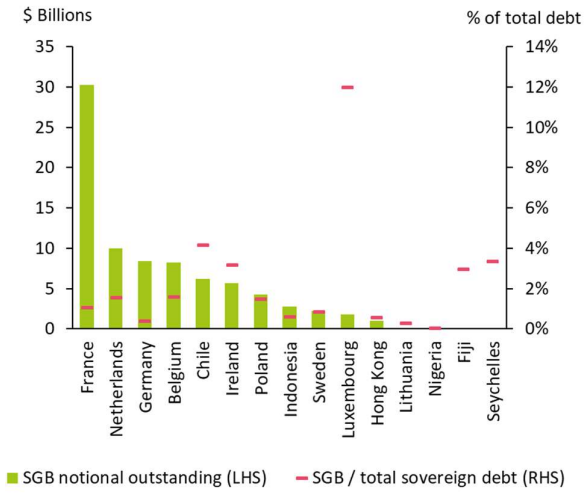
Chart 11: New issue premia for non-financial European € bonds (Sep 2020)



Source: Bloomberg Finance L.P. and Bank calculations

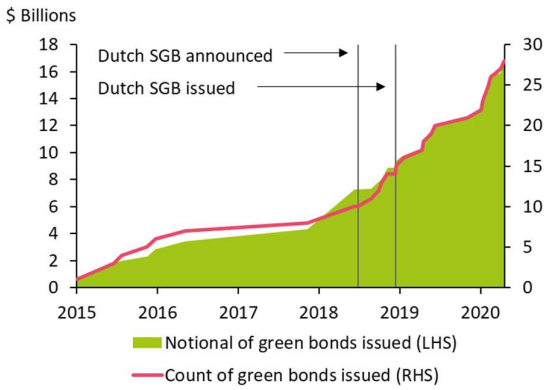
Governments' interest in issuing green bonds is also growing rapidly. The outstanding stock of sovereign green bonds (SGBs) currently stands at $80bn (Chart 12), and recent months have seen inaugural issues from a range of countries including Sweden (a use-of-proceeds bond), Luxembourg (the first European sovereign sustainability bond) and Germany (an innovative twin green and conventional issue designed to aid liquidity and comparability).

Chart 12: sovereign green bonds in issue



Source: CBI, Bloomberg Finance L.P., Luxembourg Government, Swedish National Debt Office and Bank calculations.

Chart 13: Dutch green corporate bonds



Source: CBI and Bank calculations.

The direct benefits to government finances are similar to those in the corporate sector, and include the ability to lock in commitments to undertake climate-improving investment, while reducing issuance costs and reaching a larger, more diverse investor base. But there are also potential indirect benefits for their national economies: establishing a 'green risk free curve' for private issuers to use as a benchmark for green pricing; setting conventions for issuance, including definitions of acceptably green projects or climate goals; providing assets for hedging and collateralising borrowing; and encouraging the development of climate finance expertise in the local financial services community, driving wider product innovation. The issuance of corporate green bonds in the Netherlands, for example, picked up materially after the Dutch government issued a SGB in 2018 (Chart 13).

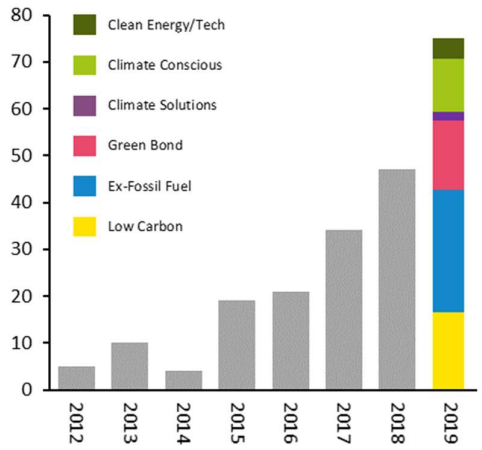
Building block 3: asset allocation strategies

However rapid the progress in climate-related disclosures and financing vehicles on the issuer side of the equation, it has been totally eclipsed by the explosion in interest on the investor side. Gripped by an increasing awareness of the scale of the climate challenge, and the impact of past and expected future policy change, investors are demanding, ever more loudly, that those in charge of their savings demonstrate that they can measure, and direct, their investments in ways that are sensitive to the climate impact of those flows. Asset managers have launched an ever-increasing range of 'climate aware' funds in recent years (Chart 14), and invested heavily in internal expertise, building systems, and hiring in specialists (or buying their firms outright).[36] The consequent shift in assets under management towards funds with higher sustainability ratings, and away from those with lower ratings, is striking (Chart 15).

But amidst all this frenzied activity, the most pressing question is how to put all of this money to work in a productive way that appropriately reflects climate factors, but also continues to deliver the desired risk and return profile for investors.

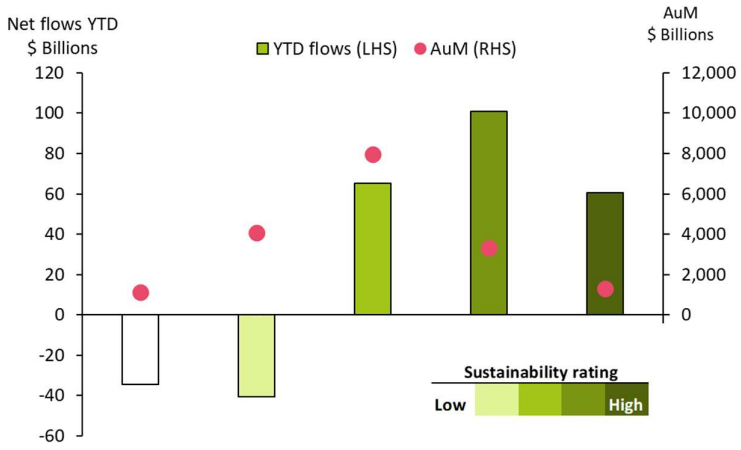
[36] https://www.ft.com/content/247f4034-4280-318a-9900-87608a575ede

Chart 14: number of launches of new 'climate aware' funds



Source: Morningstar

Chart 15: AUM and flows into sustainability-rated open ended funds

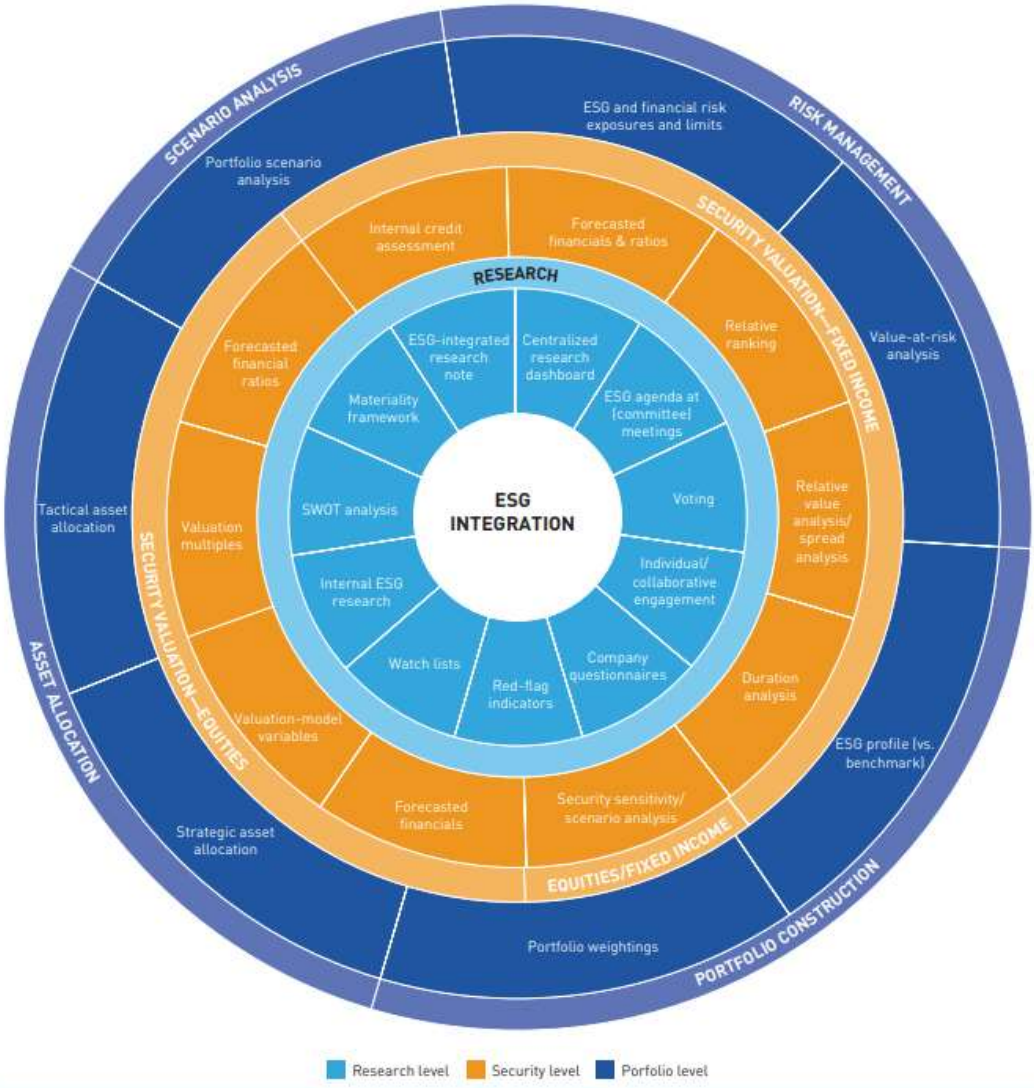


Source: Morningstar, Sustainalytics, and Bank calculations.

The nirvana is so-called 'ESG integration' – when climate is just one more risk factor in an otherwise fully integrated risk/return framework. Chart 16, drawn up by the Chartered Financial Analyst Institute and Principles for Responsible Investment, illustrates the sort of processes required, working outwards from research in the centre through security-level analysis to portfolio construction on the outer rim. It's an impressive story – but the sheer complexity of the picture also rams home just how comprehensive full integration really is. Everyone may be talking about it, but few are actually doing it – yet at least.

If that's the ultimate goal, the challenge facing asset managers today is how to build robust but consciously partial or second-best investment strategies that bridge between investors' desire to express a particular view on climate risk and return, and the practical limitations of today's climate disclosures, climate modelling and asset universe.

Chart 16: The ESG integration framework



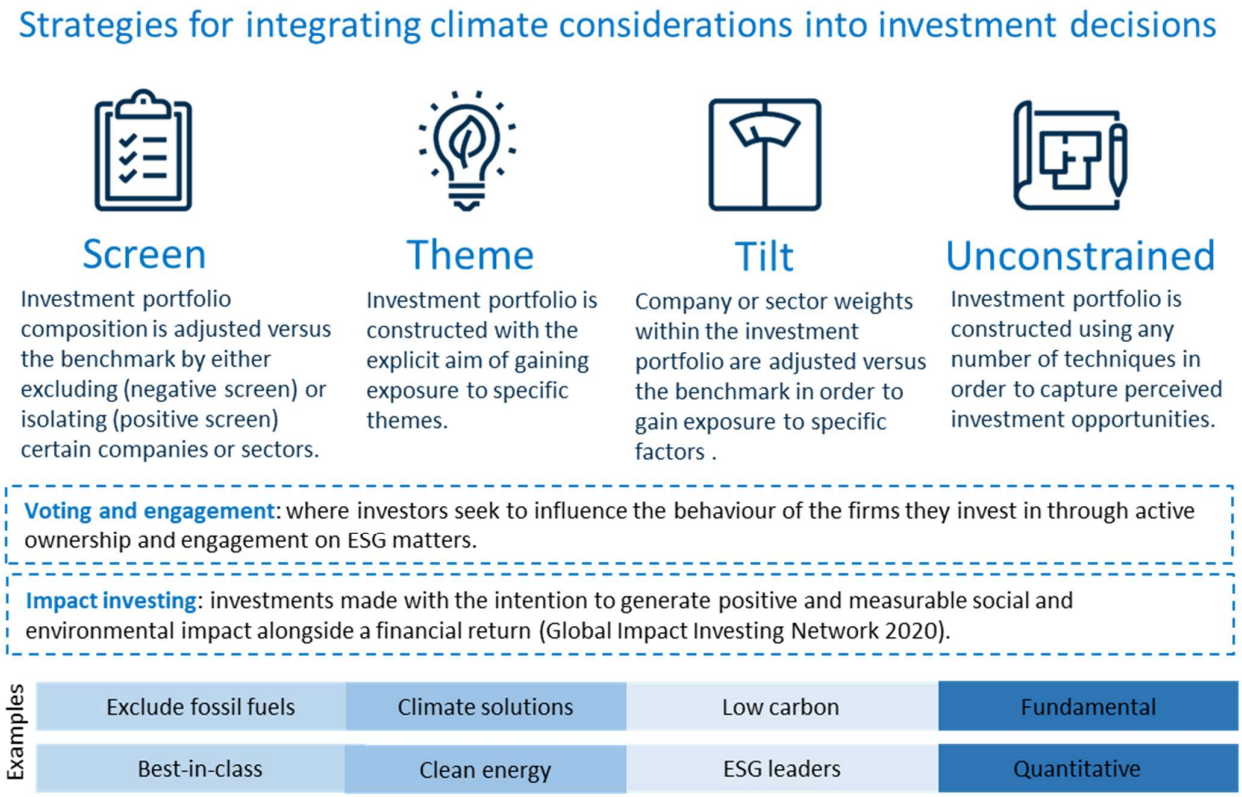
Source: CFA Institute[37]

Chart 17 shows a range of such strategies.[38] The simplest approach is a 'screen', in which the asset manager constructs a portfolio by including, or excluding, certain companies or sectors. Such approaches are currently popular because they can be directly linked to investors' wishes (eg 'no fossil fuel producers'), and require little in the way of sophisticated climate metrics. But they cannot provide much of the solution to a credible path to a carbon neutral economy. While individual investors may be able to divest, the financial

[37] https://www.cfainstitute.org/-/media/documents/survey/guidance-case-studies-esg-integration.ashx
[38] The Investment Association's Responsible Investment Framework provides an alternative taxonomy: https://www.theia.org/sites/default/files/2019-11/20191118-iaresponsibleinvestmentframeworkglossary.pdf

system as a whole cannot. And divestment strategies based on backward-looking carbon metrics give no scope for incentivising climate-enhancing investment in high-carbon sectors.

Chart 17 Strategies for integrating climate considerations in asset allocation decisions



A 'theme' strategy aims instead to look across sectors, constructing portfolios of assets issued by firms with a particular climate approach. Examples include firms focusing on the production of climate-enhancing technologies, firms with credible transition strategies in place, or sharing a common supply chain. Depending on the theme chosen, such strategies typically require somewhat more granular and timely climate metrics than screens. But they remain somewhat binary in composition, and can lack diversification.

A 'tilt' strategy starts from the same investment universe as a standard market capitalisation-weighted index, but then adjusts the weights on individual securities or sectors in that index up or down to reflect various climate factors. A common tilt might be 'low carbon', in which portfolio weights are adjusted based on a measure of each issuer's carbon footprint – or better still a forward-looking assessment of an issuer's transition trajectory to net zero, such as that produced by the Transition Pathway Initiative.[39] Tilt strategies avoid binary composition issues of the previous strategies, and can be dynamic in nature as the parameters used to construct the portfolios evolve. But they can be more reliant on those very consistent, decision useful and forward looking metrics I mentioned earlier, which are not yet universally available.

[39] https://www.transitionpathwayinitiative.org/.

‘Unconstrained’ investment – the final category in the chart – is a catch-all for the wide variety of active management strategies that investors can employ, either across an entire portfolio, or as an overlay. Such strategies may for example be driven by top-down or bottom-up research, or by quantitative statistical analysis of correlations between environmental factors and risk-adjusted returns. While such approaches have at least the potential to deliver stronger performance, by substituting judgment or modelling for current data gaps, they are clearly more costly to undertake and harder for end-investors to monitor.

This analysis draws out an interesting interaction between the quality of climate disclosures, the structure of the asset management industry and the scope for rapid growth in the role of capital markets in climate investment. Poor disclosures force investors either to form crude portfolios – which cannot send particular finely graduated price signals – or to seek active management – which, being costly, is not available to all. Neither is ideal. It is only when disclosures have reached true maturity that the full panoply of modern asset allocation techniques can be brought to bear. That underscores just how vital it is to make progress on disclosures.

There are as yet few comprehensive studies of the relative performance of current strategies. Indeed, there is a genuine question about how such performance should be measured, given that one motivation for investing in climate-based funds is the desire to generate a measurable beneficial environmental impact alongside a financial return – so-called ‘impact investing’. There has been a long and lively debate about whether achieving this requires a willingness to sacrifice financial gain. Some funds explicitly recognise this possibility in their construction, for example granting explicit concessionary rates to climate-positive projects. But others dispute the existence of such a tradeoff, noting the range of non-financial tools such as investor engagement that can act as ways to achieve impact. What is certainly true, as I’ve argued throughout this speech, is that such tradeoffs should not exist when the costs of emissions have been effectively internalised, and capital market structures have fully matured. That must be our ultimate goal.

The choice of potential investment strategies is a live issue for the Bank of England too, as a market participant in our own right. Most of our asset holdings consist of UK government securities. But 2% of the Bank’s Asset Purchase Facility consists of sterling corporate bonds, acquired as part of the MPC’s quantitative easing programme. As we stated in our TCFD disclosure, the framework for the MPC’s asset purchases is determined by the Committee’s remit given to it by the Chancellor. But, subject to the Government indicating a willingness to update this remit, we will over the coming year be considering how to incorporate climate factors into decisions on the mix of financial assets, whilst still achieving our policy aims. We will have much to learn from the range of approaches already adopted in the private sector.

Conclusions

So where does this all leave us?

One thing is clear: there is a lot to be positive about – capital markets are innovating, and rapidly, in response to the very real rise in demand from clients, businesses, investors and public authorities to take

climate risk and return seriously. And that innovation is beginning to drive some hard-edged price discrimination based on climate risks.

In short, the hot air is cooling.

But some big challenges remain:

- On **disclosures**, to reach the goal of securing a fully consistent, decision useful and forward looking set of metrics requires standard setters to agree on a single framework; for it to be made mandatory; and for corporates to measure, model and disclose;

- On **instruments**, we need to see a further scaling up in the range and depth of tools providing credible incentives for green investment and more effective transparency for investors on performance against climate goals. That will drive broader-based price discrimination between climate-positive and climate-negative assets, which in turn will provide powerful incentives for further adjustment; and

- On **asset allocation strategies**, we need to coalesce more around terminology and approaches, providing a clear and credible choice for clients and investors, on that journey towards full integration. And we need more research on what works and what doesn't!

Many of the actions here are for the financial markets themselves to resolve – and rightly so, because we want the power of markets working to deliver climate change. But there are important priorities for the public authorities too: to ensure externalities are properly internalised, so markets can do their job; to help co-ordinate and set market-wide standards, and where necessary to make them obligatory; and to use our strength and influence as market participants in our own right to drive change, where doing so is consistent with our mandates.

We at the Bank of England are doing all those things. As I noted at the start, the irony is that true success will come when we don't even talk about climate risk and return any more as a special category, but simply factor it into our every decision as part of an integrated whole. If the momentum we are currently seeing in capital markets continues, that end-goal maybe closer than we think.

Thank you