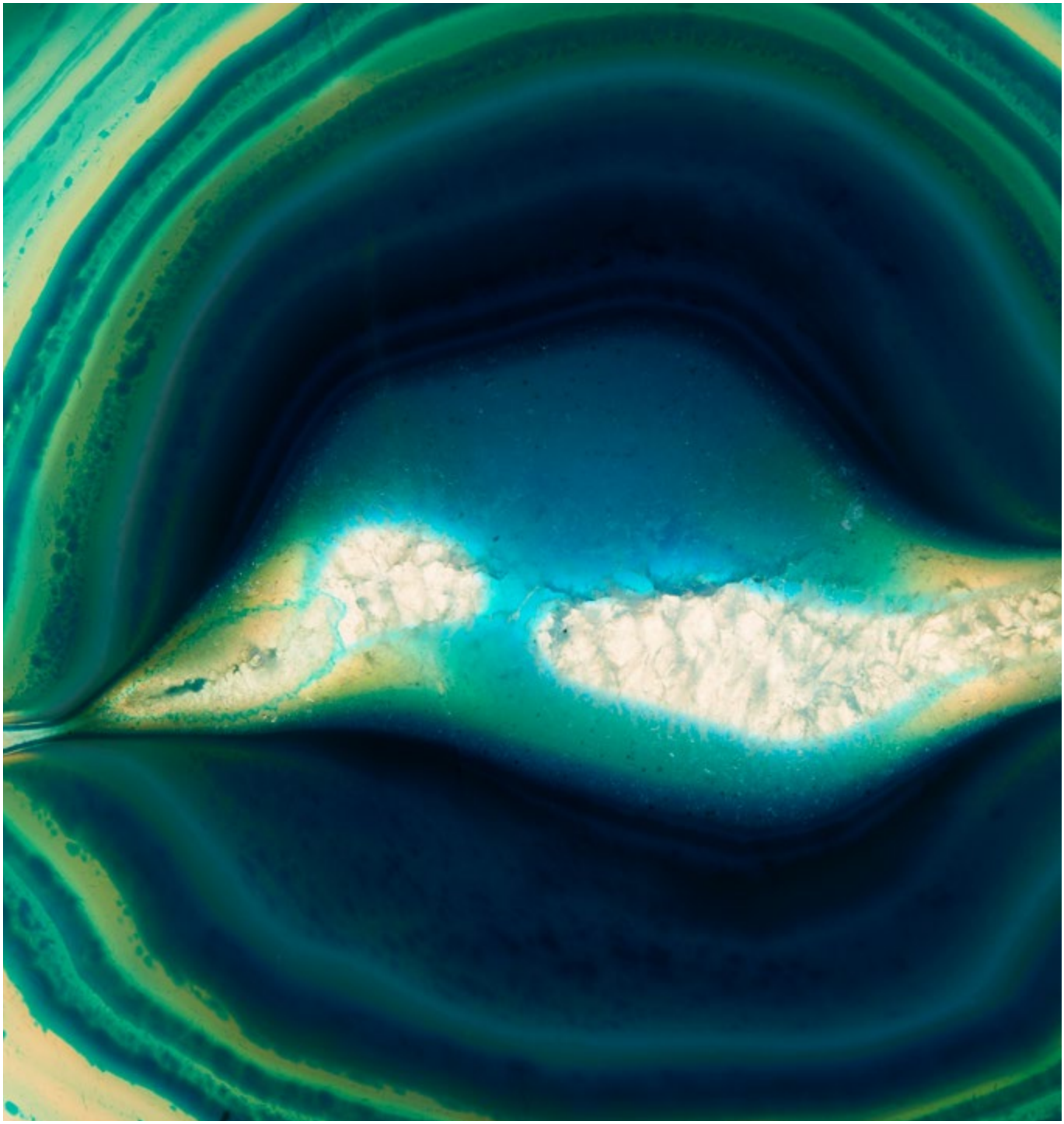
Thinking Ahead Institute

Wot we wrote 2023



Wot we wrote | best of | as at 2023

A compendium of the best investment insights (our opinion) published on the Thinking Ahead Institute's member forum.

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The map above is our preferred representation of these thought pieces, and so the exploration of an electronic document should be the most satisfying way to engage with the material. In previous versions of this document[1] we have clustered the thought pieces around hubs (such as 'governance' as in the map), which then easily served as chapter headings. For this document, we have chosen a linear path that visits most of the hubs twice. The tags on each thought piece indicate the direction of flow.

While we would claim to have always been systems thinkers, our focus and intentionality in this area has grown. Consequently, this document seeks to make more of the interconnections and flows, and to reduce the emphasis on separation. We start with the importance of purpose, an idea that will recur a few times throughout this document.

[1] *Wot we wrote 2019, Risk, return and impact | moving towards 3-D investing, Wot we wrote in 2018, and Here be dragons 2017*

1
A year needs a score, but a decade needs a purpose

Decades reveal things that our normal yearly check ins can miss. I would characterise the 2010's decade as one in which investment institutions and the companies in which they invested were very focused on the financials but started to take an interest in the concept of wider purpose.

The momentum in this theme (or meme?) suggests that we can expect the 2020's decade may be one in which that purpose gets to be much more widely entrenched and influential.

Corporations and purpose

The transition from shareholder capitalism to purposeful capitalism is complex. It is also paradoxically simple.

The state we have emerged from is widely attributed to Milton Friedman's 1970 article which mobilised thinking in corporations under a singular emphasis on shareholder value.

The supporting act in this that has played out for more than four decades has been the contribution of measurement which has been faithfully reciting the mantra that 'figures don't lie'. This simplification gave organisations a convenient excuse for avoiding a lot of inconvenient challenges – like is our organisation fulfilling a useful purpose.

But this allure of the measured over the meaningful has been both unhelpful and unhealthy. It has created a simplification of the business realities to occur. This is that corporations and their institutional owners have been messing with a finite pool of natural resources without charge in an unsustainable fashion. Greta Thunberg's statement at the UN Assembly that 'we are talking fairy tales of eternal economic growth' was accurate.

Within the natural resources heading lies corporations' considerable carbon footprints – past, present and future. The responsibility of asset owners and corporations for some part of the climate change problem is clear-cut. As this becomes a stand-out issue in the 2020's agenda, in my view the number one issue, it will be critical for organisations to play their part in contributions to its solution.

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Corporations' responses to this problem and other societal stresses are arguing for transformational changes to business models that make them purpose-centred. Here there is a new balance to be struck via working on a new corporate mix: societal contribution, employee experience and client value proposition, propelled forward by profits, supportive culture, and integrated thinking and reporting.

We need to see value in a new light in which well-being ranks alongside wealth creation. Complex – yes, but critical to the future.

This is already out there as a concept – the US Business Round table, the UK British Academy, and the letters from Larry Fink, founder of BlackRock, have been arguing in this direction.

Ideally the purpose of corporations should express a cause that is resonant – engaging, meaningful, and impactful and is respectful – inclusive and serving. In addressing this sort of direction of travel organisations will have to overcome a lot of inertia.

They must direct substantial change on the fundamental priorities in their stakeholders – owners, employees, clients, society. They must settle on an alignment of collective vision and mission by socialising it deeply and widely. And they must adapt their strategies and communications to fit new priorities and the changing zeitgeist. This is massive change and it will surely take a decade to achieve the transformation, but it can be done in that time-scale.

The sources of soft power needed to achieve this will reflect how corporations respond to the pressures and incentives within the system. First, people want these sorts of changes as consumers and planet earth inhabitants; second governments want these sorts of changes to direct new focus into public policy tangles; and third the asset owners' role in this is particularly critical. Some history helps to understand this.

Asset owners and purpose

Interpretation of asset owner fiduciary duty has been the parallel problem to Friedman's shareholder capitalism. It has focused substantially on the measured short-term return not on the sustainable long-term outcomes.

The emergence of a new interpretation of sustainability is needed to advance a better purpose here. The big asset owner in owning the slice of the world economy (they are identified as 'universal owners') must confront the principle that future returns (a) will only come from a system that works; and (b) will only be valuable in a world that is pleasant to spend it in.

In short, the asset owner has an enlightened self-interest path to take to support the financial system and its components through an evolution to purposeful capitalism. It is a compelling case that it should use its soft power to generate that purpose in the corporations it owns.

The 2010's launched the asset owner master class. I would cite Adrian Orr at New Zealand Super and Hiro Mizuno at GPIF, Japan as two particularly inspiring leaders of highly progressive organisations that have laid the foundations for purposeful asset owner practices.

The GPIF example is the best one on universal ownership as is covered in the HBR 'Cold Call' podcast which showcases Harvard Business School case studies. This case was 'should a pension fund try to change the world?'. The conclusion is really encouraging. The class saw Mr Mizuno as the stand-out favourite of all their case studies and agreed that pension funds armed with universal owner thinking should try to change the world and might well be successful.

The above exemplars herald a new string of leadership- and impact-minded asset owners that in the 2020's can bring greater purpose, well-being and wealth into the lives of the 4 billion of savers and investors on the planet (excuse the rounding) and the other 4 billion or so people that are downstream to their actions.

The simple reality is that these organisations, in shining a light on a stream of problems, can reveal them as a torrent of opportunities. They are too important to fail in this mission.

As we tread a path from systems to governance, we turn from investment organisations in general to our specific organisation. >>>

2
Do we really know our organisation?

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We have been getting more into the subject of identity as individuals, particularly in our work lives. This is an important part of understanding the 'soft stuff' that is increasingly critical to successful lives.

And there is a similar search for organisational identity kicking off in discussions about purpose.

This blog suggests one way to approach this difficult subject, drawing inspiration from the work of Atul Gawande who showed how much positive force can come from the checklist – a tool that appears rather humble but packs a punch.

My organisational identity checklist has eight items on it. Why so many? Our lives are increasingly complex, meaning that there are always many factors that should be thought through; we will make avoidable errors by omitting any items in the list. The checklist helps us avoid those errors.

The organisational identity checklist

a) Purpose and value | what purpose(s) we serve and what we see as the value that our organisation exists to create

b) Mission and vision | why we exist and what we want to be

c) Stakeholders | what is the domain, priorities and boundaries of our reach and influence

d) Values | what we believe in and how we will behave

e) Culture | how does our organisation think and behave, how does leadership behave

f) Investment beliefs | what do we believe about the investment landscape and our edge to inform our strategy

g) Organisational beliefs | what do we believe about our organisational context (governance, stakeholders, mission, etc.) to inform our strategy including our endowments as an organisation

h) Strategy | what is our competitive game plan – thinking ahead, employing our beliefs, reflecting uncertainty, creating value.

Four features are worth noting based on my experiences with using this list in asset manager and asset owner contexts.

First, these points are very connected, even overlapping in places, and should be judged together. An example: mission is derived from purpose.

Second, some of these elements are substantially enduring, but some are significantly evolving. The more enduring elements are headed by purpose but even this factor is subject to some change occasionally. Here the purpose may undergo a generational shift, and then it endures perhaps for another generation. We have written about accelerating change in our industry which certainly has a bearing on these factors. The beliefs certainly should be evolving more quickly over time to reflect new circumstances, and as a result the review cycle for these points should have a faster cadence.

Third, the critical thinking applied to these points needs to be in collective settings, particularly in boards and in top leadership teams. The attention given to this subject has been squeezed by more urgent agendas, we should make more of agendas selected on importance.

The final point is that the apparent dryness of a checklist can yield an interesting and compelling narrative brought to life by good stories and prose. Stories from organisational pasts are particularly relevant to identity. History informs many dimensions of contemporary organisational identity, particularly culture. My two favourite document examples are Baillie Gifford – Our shared beliefs; and Google – Ten things we know to be true.

In our view organisations are set to change a lot in the coming decade. They should use an identity checklist to set their change process is on sound foundations.

3
How asset owners are maturing into a more purposeful role

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Asset owners worldwide are being confronted by multiple stakeholders to take on greater responsibility and be noticeably influential in the investment chain than ever before. No more so than in the area of sustainability and climate change. This has added significant complexity to decision making and raises hard questions about resourcing and whether their governance arrangements are still fit for purpose.

In trying to answer these questions we believe it is helpful to think about organisational maturity as a concept, which is influenced somewhat by fund size, but mainly by sophistication and ambition to deal with this increasing complexity.

To help, we have developed an asset owner maturity model which can be viewed as a set of structured levels that describe how well the behaviours, practices and processes of the organisation can reliably and sustainably produce required outcomes. There are three distinct levels within it: and which are differentiated by the specialisation and depth of governance and the sophistication and breadth of the investment model.

In the past, most asset owners have kept their capabilities to the type A level in which the board has ownership of the investment policy via the strategic asset allocation (SAA) and implements it using outside investment managers. But with deepened purpose and more complex goals coming from sustainability (like net zero) and headwinds from a difficult macro-economic environment with a new normal of lower-for-longer interest rates, this approach looks somewhat outdated. Indeed there appears to be an imperative for many to step up to a more sophisticated model that will allow them to deliver enhanced outcomes under these circumstances.

This maturity profile, increasingly adopted by asset owners, is a type B (well-resourced) level in which the board shares the investment policy ownership with an internal team (or the outsourced CIO is an equivalent model) which also owns the investment implementation.

The next maturity development is type C (advanced) where the internal team or outsourced CIO takes responsibility for the investment policy and implementation while the board owns the risk appetite strategy in a total portfolio approach (TPA) arrangement. The so-called Canada model of asset owners (such as CPPIB, CDPQ, OTPP) is a relevant example here where an increased in-house resource configuration has led to agency value chain improvement through cost reductions; better management of external agents and increased investment sophistication though co-investing in private market mandates and stronger correlation with liabilities through LDI.

Clearly each asset owners' circumstances are different, and many cannot contemplate moving up the levels, but it is our contention that those aspiring to have real-world impact through their sustainability programmes will find it extremely hard to manage without attaining type C maturity.

Notwithstanding, we observe that funds continue to actively review their governance and investment models and explore how these can be enabled by cultural and technological innovation. They are also placing greater value on methods that capture higher investment sophistication with lower complexity, such as OCIO, co-investment models, index strategies and TPA.

Last year we published a global study into the current and future asset allocation practices of leading asset owners, with a particular interest in understanding TPA – a joined-up investment philosophy that results in a more streamlined approach to portfolio construction. The concept of TPA is both a behavioural construct (ie relating to mind-set) and a technical construct (ie relating to process and governance). When fully present in organisational mind-set, process and governance, a TPA is well-equipped to deliver outcomes that are consistent with the fund's mission and goals, with likelihoods of success significantly higher than are possible when using customary SAA-based approaches. We estimate that for a TPA process that is done well, these advantages – in return terms – could be worth in the region of 50-100 basis points per annum.

A number of funds in this study (ATP, CPPIB, Future Fund, GIC, NZ Super, QSuper and TCorp), identified themselves with this governance approach citing advantages in dynamism, decision framing and decision-making. We believe that a TPA should produce a portfolio that fares better on risk measures and advanced sustainability practices and we continue to see slow but steady adoption of this approach as organisations try to better connect the total portfolio with the fund goals.

More recently, we have worked with a number of asset owners to examine transformational change in the following areas as they consider their maturity profile:

- to address multi-stakeholder purpose with a focus on clients, workers, society, planet and owner/sponsor, as well as a model that explicitly commits to manage portfolios and operations in line with net-zero ambitions
- develop best practice in employee experience including diversity, equity and inclusion (DE&I); build out learning and development programmes and promote superteams
- build total portfolio thinking where investment processes are more aligned to goals and enabled by collaboration and one-team culture; 3D investing (risk, return and real-world impact goals); and concepts of universal ownership to build better beta through more joined-up management of externalities and systemic engagement.

It is clear that asset owners are being challenged to transform themselves in order to be fit for a broader purpose and, while change remains slow, sustainability considerations are accelerating this shift. Furthermore, there is a growing understanding that maturing brings with it distinct advantages, through increased scope for investment sophistication and specialisation, while also better addressing challenges such as disjointed governance and fiduciary constraints.

Acknowledging that all models are wrong, but some are useful, we believe this framework will be particularly helpful for those asset owners aspiring to lead this change. And they are likely to be collaborative, self-aware organisations that subscribe to systems thinking. You know who you are.

4
The power of organisational culture to navigate climate change

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It is received wisdom that an organisations' greatest asset is its people, but it is less well understood how this asset can be applied to addressing our industry's greatest challenge: sustainability and particularly climate change. But this is changing as investment leaders, particularly in asset management, increasingly recognise the transformational role a strong culture can play in executing business strategies that have ambitious climate-related targets embedded, notably those with net-zero ambitions.

As a result, investment organisations are setting their business strategies with greater reference to cultures that are highly principled and have higher levels of personal responsibility. At the same time recognising that green business strategies, set in isolation, will not work if the organisational culture does not support or motivate their implementation.

But this shift is not easy and doesn't come naturally. An organisation's cultural journey is typically one of self-discovery, which can be uncomfortable at times, but if done well is effective at identifying weaknesses, which would undermine the best-laid strategies, and allow strengths to be reinforced. Some of the typical weaknesses are a culture that shies away from innovation; this often results in people, and their skill sets, becoming siloed and ineffectively used. As a consequence, opportunities for breakthroughs and the transfer of learning and skills are missed and organisational inertia is perpetuated. Also, data and other knowledge sources are left unharnessed, meaning solutions fall short and are not as informed as they should be. Other areas of development, that have shown up in our power of culture research, are the under appreciated cultural edges that can truly differentiate organisations, such as thoughtful diversity, equity and inclusion strategies, having openness and transparency as norms and having a clearly articulated purpose that unlocks a multi-stakeholder organisational mindset. The latter has already become more important in influencing investment organisations' climate-change strategies.

But what exactly is organisational culture and can you measure it? While there are many definitions, we have come to see it as the collective influence of shared values and beliefs on an organisation and how it thinks and behaves, which is influenced by leadership actions at all levels in the organisation. Culture can determine how a group collectively understands a problem, how they work together to create solutions, and respond to change over time. Which is precisely why a strong and clearly narrated culture is probably the most effective organisational tool for leadership to rely on when attempting to soak sustainability through every aspect of the company. And yes, it can and absolutely should be measured, on the basis that measurement gives a subject respect and management without measurement is weak.

Back to the centrality of purpose and the imperative for it to reflect an organisation's culture. This is based on the simple premise that when a mission is clearly defined, the type of approach and tone of response is set. Added to which is how culture and purpose can be mutually reinforcing whereby the establishment of a strong people and teamwork ethos not only underpins an organisation's purpose but also promotes collective responsibility for it and belonging to it. Another cultural attribute that purposeful organisations will aspire to is transparency, which opens up opportunities for learning from stakeholders, while helping to align saying and doing. A focus on transparency naturally leads to an emphasis on integrity and authenticity, which when coupled with high ethical standards builds trust and avoids the temptation to over claim or green wash.

As an aside the whole area of climate change is awash with organisations using it to gain a competitive advantage. It is our contention that organisations that truly understand this area, in all its complexity, will develop a humbler culture and be reflected in their reporting.

This is not to diminish the link between strong culture and competitive edge. Indeed our research points to a strong emphasis on culture, when synchronised with purpose, being a prerequisite for organisational success. With many investment organisations acknowledging its key role in enhancing differentiation, especially around sustainability and resilience. We have identified several structural blockages preventing progress toward true sustainability, specifically:

- . With long time horizons, uncertainties, and inherent interconnectivity, any effective response to the climate change challenge will require multiple insights. Therefore, building teams that are capable of delivering exceptional results – or superteams – has become more critical than ever. Led to success through combining diverse and exceptional talent, these teams' collective intelligence is fully leveraged by great culture and governance. This collaborative culture may require staff to gain new skills, or have dormant skills put to work.
- Just as sourcing skills is important for addressing climate change, so is collaboration, both between and within organisations. Many organisations admit to operating in silos across regions which stifle innovation and prevent a more joined-up, holistic, and teamwork-oriented approach to sustainability. Progressive boards are therefore looking for how collaboration can produce better outcomes and reduce gaps in their thinking and how a culture of teamwork and transparency can identify the correct problems and facilitate spaces for collaboration. At a systems level, large asset owners – such as the Government Pension Investment Fund of Japan – are increasingly looking to build strategic partnerships with organisations that share their culture, so as to collaborate better across the industry.
- Investors are increasingly paying more attention to the types of incentives they offer. If structured appropriately, incentives can increase firm value, refocus efforts away from short-term targets, and create better accountability on performance too. Similarly, we are seeing how investors are setting out clear expectations using stewardship policies, with these expectations becoming increasingly specific in regard to climate-change action. In addition, organisations with effective cultures will more easily identify and put in place the right incentives to motivate and sustain such action.

In conclusion, it seems fitting to return to purpose. Investment leaders are being truly challenged by inexorable forces to become more sustainable and impactful. They are having to incorporate sustainability into their existing capabilities and collaborate to build strategic partnerships to fill gaps. All the while having to set the tone for a workforce which is increasingly drawn to greater social responsibility.

It is our contention therefore that organisations with well-considered and well-articulated purposes, which act as a catalyst for a strong and well-maintained culture, are much more likely to be the truly sustainable investment organisations of tomorrow.

So it is time for more investment leaders to recognise that incorporating purpose and culture into business strategy not only makes their organisation more sustainable and resilient, but also equips it to deal with the complex challenges of climate change. And what's more, in doing so together, they will provide the collective action required to solve our generation's greatest commons problem.

We started our path with purpose, and the previous piece ended by returning to purpose. Having arrived at 'governance' we now explore some varied ideas from best-practice features, a thinking hack, to ideas formulated in the Covid pandemic relating to the future of work and social capital >>>

5
The best-practice governance features of boards and investment committees

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Life for pension funds is already challenging. But over the next decade, the pace of change will quicken even further in the face of a 'great acceleration' of change caused by geo-politics, climate, technological leaps and macroeconomic instability, among other factors.

This may sound daunting, but there is a silver lining; there will be many opportunities for investment committees (ICs) – and trustee boards too – to strengthen their governance if they keep focused on best practice. As a starting point, well run ICs and boards may want to use our top ten governance check list to prepare for the next period of change ahead.

Retaining a strategic focus is vital for all effective board governance and doubly so for ICs where there are always temptations to get lost in the weeds. While ICs don't have to do too many things, they must make sure that things get done and their greatest strategic focus should be on the high-order principles. The most important are purpose, mission, values and beliefs; and critically they should ensure the strategy is consistent with these principles.

Following on from the first point, an IC's greatest asset is its executive team (the 'executive') and delegating well is a way to ensure strategic focus is retained at the board and IC level. The investment insourcing/outsourcing configuration is particularly important here. For some that is using an internal team as the executive, but if that isn't feasible, the outsourced CIO/fiduciary management model is an effective alternative.

Oversight is a central IC activity and the discipline with which it pursues this role is important. Key is the ability to go deeply into new investment strategies, as effective engagement and proper IC support only comes with mastery of the detail. While oversight involves following progress – through strategy, process, portfolio and performance – disciplined oversight involves challenging the executive and being motivational.

Jim Collins' timeless advice, in his book Good to Great, is that organisations need to get the best people 'on the bus' and put them in the 'right seats', ahead of agreeing the bus's destination. This is apt for ICs. Good IC candidates will be diligent and competent and chosen in order to make a good team. Team balance is also important here, noting that having investment competency on the IC is critical, but is not required in every member; notwithstanding every person should bring a unique skill.

Five is a good number of members for an IC. This is large enough to ensure a wide range of expertise, but small enough that decisions can be made efficiently. If your IC is much bigger than that be prepared for more time in discussion with no likely improvement in outputs. There is one proviso to this rule of five: you need to secure very high attendance rates to make sure IC meetings are fully quorate. But then IC meetings should be iron-clad in members' diaries anyway.

The chairperson's role is crucial in terms of setting overall strategic direction and the board's culture. They are responsible for achieving best practice and ensuring high standards. In addition, the people-development and coach role relating to all other members falls to them, as does effective liaison. Good chairs make such a difference, it is hard to stress this enough.

Differences of opinion are inevitable, but good boards should confront these differences and come together with unified conclusions. It is not clear why so many ICs never take votes. Good technology (for example Slido) enables quick checks on mood, deeper examination of issues and a contribution to the trail of why and how decisions were made. Many investment decisions are marginal calls, so full consensus should not be the expectation, instead settlement of views should be the goal.

This is a relatively new feature of a well-run board, having come to prominence in the last decade or so. Good investment beliefs are those which are clearly drafted, edgy (in that they imply stretch) and reflect the fund's comparative advantages. With sustainability rising up the agenda, having a settled set of well-socialised principles and beliefs has become commensurately important.

The insourcing/outsourcing decision is critical for creating effective and balanced governance. In ideal circumstances, a large fund can support a team that is highly competent across a wide investment scope. In many circumstances though, scale, competency and scope can only be achieved using the outsourced model. This model is certainly attractive from a scale and specialist expertise perspective, but it can only work well with highly focused IC members that can successfully address principal/agent problems.

Many of the current difficulties in pension fund investing stem from a lack of attention paid to culture. Strong culture can be viewed as leveraging good people through behavioural norms. So, ICs should examine their own culture, including doing board effectiveness check-ins. They also need to examine the culture of their executive, whether it's an internal team or an outsourced CIO. As part of this, ICs should ask the tough questions, like:

- How much attention and individual treatment is our fund getting?
- How well is the team aligned and motivated?
- What is being done to attract and retain talented team members?

Investment committee governance has improved markedly in the past decade, with best practice evolving positively year on year. But it remains patchy overall. Current challenges will provide the opportunity for a general step up. Those boards paying attention can seize their chance.

6
The power of thinking right to left

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I was quite struck by a line within an article written by Nitin Nohria, the dean of Harvard Business School (HBS), who made a very simple yet powerful suggestion to counter short-termism: think right to left.

Nohria credits the original idea to Jim Champy, author of Re-engineering the Corporation: A Manifesto for Business Revolution. What most business leaders (and arguably most investors) do is think left to right ie start by focusing on immediate issues and then think about how to get from here to the goal (left to right).

Champy recommends instead that leaders think more carefully about their long-term goals and then think backward about what they need to begin doing today to achieve these goals (right to left).

Nohria applied this thinking to his role of managing the MBA programme at HBS. Thinking left to right, he argued, would lead to him discounting the threat of online education while thinking from the right about the business education landscape in ten years' time, he could no longer ignore its promise and peril.

I believe this way of thinking has immense implications for those investors who want to build a long-horizon mindset.

Right to left thinking, by design, focuses on the long term because it starts from the distant future and works backwards to the present. It encourages investors to project themselves far into the future, think strategically about long-term end goals, long-term liabilities and/or obligations and resources and comparative advantages they can exploit to achieve these long-term goals.

Right to left thinking improves alignment. When investors start their thinking process from the right, the purpose receives the attention it deserves. For example, engaged in this way of thinking, a defined contribution pension delivery organisation would place more emphasis on achieving sufficient incomes for plan participants post-retirement instead of participating in rather harmful short-term "mark to peers" activities. Left to right thinking starts with and focuses on the "what"; in contrast, right to left thinking focuses on the "why". It is the "why" that inspires people and encourages the right behaviour that aligns with long-term goals.

Right to left thinking also enforces discipline for investors to focus on the information that encourages long-horizon thinking. Instead of assuming that the current themes continue to play out and trying to front run markets in identifying winners and losers, right to left thinking encourages the identification of long-term transformational changes that have far reaching implications in the distant future and higher impact on the investment portfolio in the long run. Instead of obsessing about catalysts for near-term price adjustments (flow of immediate results, how earnings might compare with market expectations), investors who think from the right naturally pay more attention to factors like long-term cash flow generation potential, sustainability of competitive advantage and, for universal owners, sustainability of the financial system/ wider society/environment and licence to operate issues.

Last but not least, right to left thinking promotes a long-term approach to risk management. Starting with immediate issues and short-term outlook, investors understandably (but mistakenly) view risk as price volatility. A long-term risk management approach starting from the right recognises failure to achieve mission as the ultimate risk and therefore targets avoiding a permanent impairment in the mission. With a long time horizon, the likelihood of certain extreme risk events become significant enough to receive attention while a short-term left to right approach would dismiss its chance of occurring and ignore its potentially catastrophic impact. A great example of applying right to left thinking in risk management space is so-called pre-mortem analysis. It is designed to ask the question "in 20 years' time, our organisation fails/no longer exists, what happened?" This technique facilities a deep discussion on potential threats and increases the likelihood that main threats are identified and as a result are prevented or avoided or, at least, managed in some way.

Building a long-horizon mindset starts from thinking right to left.

7
The future of work

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It was in 2020, a few months after the start of the Covid-19 crisis that Klaus Schwab, executive chairman of the World Economic Forum, called for The Great Reset – a clarion call for the world to act 'jointly and swiftly' to revamp all aspects of our societies and economies. Saying the tool to do this is stakeholder capitalism – and fundamental to this is a much-needed transition to a 'fairer, more sustainable post-COVID world where companies have a responsibility, and a rare opportunity, to rethink organisational and workplace structures and to invest in their workforces'.

Over the last decade or so, conversations around the future of work have been largely linked to job automation. However, the pandemic has rapidly widened this conversation to also include where we work, how we work and the ways in which workplaces and the workforce is organised. It has also had a big impact on employee-employer dynamics – effectively the give and the get – with more employees demanding improved flexibilities and employers struggling to catch up.

With productivity and organisational culture on the line leadership engagement on the topic has mushroomed. The focus has been often on emblematic issues such as hybrid working, shortened work weeks and the redesign of workspaces to create more magnetic offices. However, there are some wider themes which we have observed through our work with investment organisations:

a) The hybrid work journey remains messy

It is clear that the future of work is hybrid. In a CFA Institute's survey on the future of work, 81% of investment professionals stated that they would like to spend more time working remotely, with employers having to rapidly adapt to meet this demand through more flexible working policies.

However, hybrid design needs strong execution, with value being currently derived through considering social interactions, space utilisation and time optimisation and future value being developed through the presence of networks, relationships, shared norms and trust. There is a real opportunity here to think about what hybrid working actually means, with better policies involving a degree of co-creation with employees and where work is adapted based on location, synchronicity and connectivity needs.

Part of the hybrid challenge isn't just about getting employees into the office – it's also about making the most of their time. Microsoft's latest Work Trend Index notes that despite the fact that 44% of hybrid employees and 43% of remote attendees don't feel included in meetings, just 27% of organisations have established new hybrid meeting etiquette to ensure that everyone feels included and engaged. Leaders need to make the office worth the commute and employees now have different expectations as to what the office experience should deliver. Social capital and the value that it adds through collaboration, belonging, trust and goodwill should be seen alongside human, intellectual and financial capital in organisations as a key enabler of value creation. Innovation is also powered by social capital. So, the challenge for leaders is to reconfigure their workspaces to prioritise social engagement and set aside time for in-person activities where interaction is facilitated.

b) While talent is everywhere it is unnecessarily scarce

We are in the midst of *The Great Reshuffle* – a term broadly used to describe the mass movement of workers seeking roles that better meet their work/life requirements and/or are better aligned with their values. US academic, Anthony Klotz – who coined the forerunner term *The Great Resignation* – notes that individuals are now seeking opportunities that allow them *'to fit work into their lives, instead of having lives that squeeze into their work'.*

Talent is dispersed globally and there is an opportunity here for leaders to become more creative in using global talent and to think about how it can be used to create a more agile and distributed workforce. The shift to a more networked structure requires moving from traditional approaches where employees are boxed into projects based on their current job role to a more holistic, flexible approach which matches employees' varied skillsets to relevant projects. This requires the collection of more data on employee experiences, a better understanding of a workforce's skills and embracing technological innovations that allow teams to work in more global and continuous real-time ways.

With in-person time being reduced, we also find that the T-shaped qualities of people and teams becomes more valuable in the new world of work. T-shaped individuals and teams seek to connect dots better through building inner ties and developing outer networks. There is a real opportunity here for leadership to transform existing teams into superteams – by combining diverse and talented individuals within a strong culture and having excellent governance – to deliver exceptional outcomes.

c) The rise of the human-centric organisation

The COVID-19 crisis has been a defining leadership and transformation moment, where leaders have been called to reset their future of work agendas and lead the way to better and more human-centric workplaces and workforces.

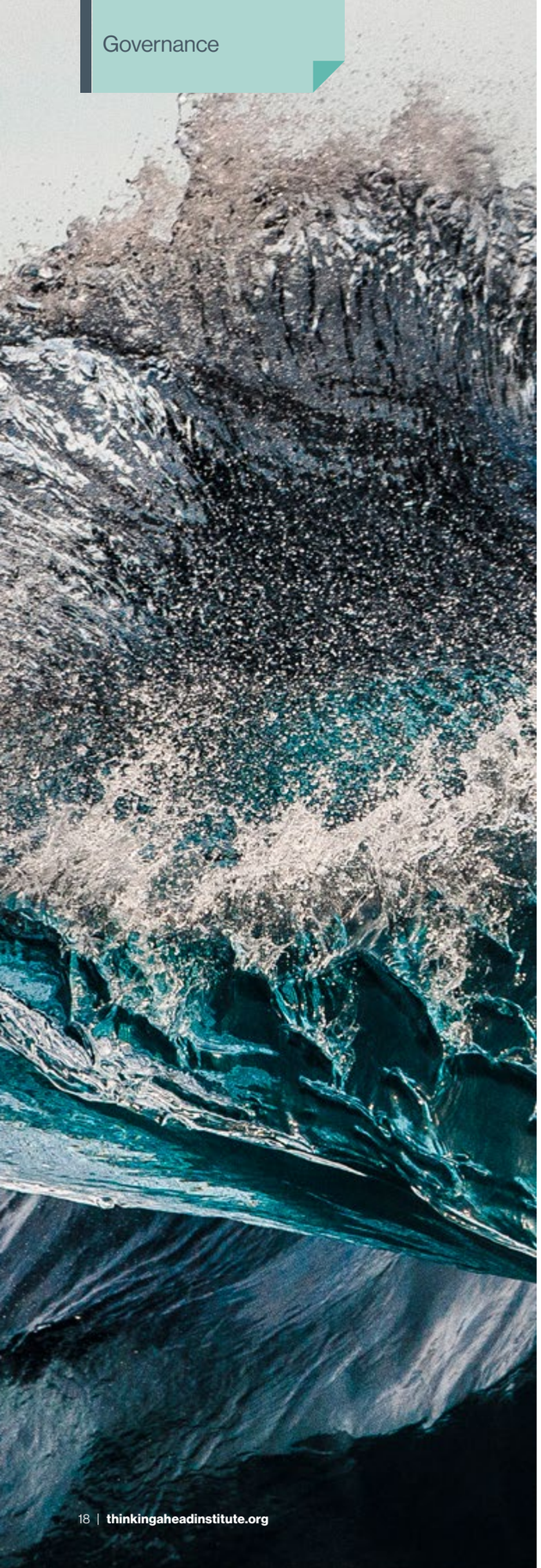
We are now in the era of human focused company culture where workers are re-evaluating what matters most to them. This has prompted employers to focus on the well-being and personal satisfaction of employees though increasingly flexible work arrangements, investing in wellness programmes and boosting diversity, equity and inclusion efforts.

LinkedIn's 2022 Global Talent Trends survey notes a 147% increase in the share of job posts that mentioned well-being since 2019 and a 73% increase in companies' posts about well-being. According to the survey, employees that feel cared for at work are 3.2x more likely to be happy at work and 3.7x more likely to recommend others to work for the company. The same survey notes that work-life balance trumps even bank balance for job seekers.

Productivity is multi-faceted. Work has long shifted from simply a function of time, activity and effectiveness and viewed solely through the lens of the value delivered to the organisation. Instead, the employee value proposition has become more central and includes work flexibility, work/life integration, personal growth, employee experience and well-being. There is an increasing appetite for a new leadership model to deal with these challenges that is less hierarchical, more networked, more versatile and is driven by more soft power. This new model needs to encourage empowerment, joined-upness and humanism with positive stakeholder outcomes at its core and which champions connections and collaboration while focusing on behaviours.

d) It's a juggling act

Successful work design in this new world will require finding a fairer balance between employee and organisation, where employees crave flexibility and meaning and employers require productivity, impact and a culture that aligns with its purpose. A key ingredient of success will be an emphasis on how work is done. This is the sweet spot where organisation and employee can meet around *belonging and teamwork* at the same time as *values and expected behaviours.* Finding this balance will require some juggling and enlightened leaders will need to think deeply about these wider themes.



8
Making and taking fresh tracks

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Hardships often prepare ordinary people for extraordinary destinies. CS Lewis

Covid and its ramifications have pressed the reset button for many facets of our lives and given us plenty of agency around our futures. It has also underlined the importance of having wider perspectives that help us make the best choices.

The unprecedented situation led us to publish a thought-piece series, titled Wider Perspectives[2], on this drawn-out saga with its distinct acts – akin to a Shakespearean play – with plotline twists, big morality themes and lessons to be learned.

With four acts already played out, we think it's a time to write a denouement. There is something of a final act feel to Covid, even though it is giving us a very long goodbye.

Covid at three

Three years on, Covid has spectacularly revealed the connections and vulnerabilities inherent in our world, suggesting some adaptations are required for us to survive and flourish:

- How to use a burning platform to quickly adapt, witnessed by the speed of vaccine development and movement to remote working
- How to take the systemic perspective – seeing the complex global ecosystem with its multiple connections, including in the health, public policy, social behaviours and work areas
- How to deal with life just happening to us, with its rough justice and a wide spread of Covid outcomes. Hardships are indeed preparing ordinary people for extraordinary destinies

These observations come through *zooming* in to our personal lives and then *zooming* out on this disrupted world in disarray. This process can enhance our critical thinking and widen our perspectives, and therein lies a silver lining.

And nowhere is this truer than around the future and purpose of work, where we have the chance to find and take fresh tracks towards a better future.

[2] The *Wider Perspectives* research has been related to the wider aspects of the Covid period from 2020 to 2023.

Work design

While hybrid-work arrangements are considered the new normal, no-one is claiming to have got it right yet. We have some very tricky balancing acts to master. Starting with home and office, but also digital and in-person communication, informal apprenticeship and structured training, as well as autonomy and conformity. And in finding a sweet spot, organisational context is everything.

Dan Pink's thesis in 'Drive'[3] provides some important perspective and new tracks. That the secret to high performance and satisfaction at work is humans need to seek control in our lives; to get better at something important; and to commit to the service of something larger than ourselves and in so doing finding belonging. The three words capturing this are autonomy, mastery and purpose.

These are the intrinsic motivations that can lead us to a fresh type of office. A *magnetic* place where we build the special social experiences that secure our mutual trust and catalyse a transition from simple teams to Superteams[4]. We need these 'magnetic offices' to bring us together based on the principle that *we all do better when we all do better.*

The work zeitgeist is changing fast, as millennials become a larger cohort and demand more respect, inclusion and work/life integration. This calls for new organisations that are less hierarchical, more networked and versatile.

And they must provide leadership in various society-reflecting trends, particularly inclusion and diversity, refining organisational purpose and the elevated role of values at work. For this, they will need to work hard at finding ways to build the critical social capital and trust required in a more digital world. Some fresh tracks have been made and are worth taking.

Purpose and sustainability

Mark Carney's work on purpose and values in 'Value(s)'[5] brings perspective here. He refers to the values-flattening problem in which the creep of emphasising financial value and putting a price on everything has blunted societies critical need for the values of solidarity and resilience, fairness and compassion. No one thinks that money is everything, and Covid made us very conscious of that principle, but too often our behaviours in the market can suggest something different.

The culture of our times is increasingly about data and is summarised neatly in Drucker's principle: 'What gets measured gets managed'. But this is too simplistic, and we need to ensure that purpose and good behaviours show up in the process. The systems-thinking framework that Carney advocates is joined up in paying full regard to the multiple moving parts that this implies. And it emphasises the intangible infrastructures needed in finance, like culture, collaboration and accountability.

We have a perfect place to apply this thinking in the net-zero climate-change ambitions that are so game-changing in industry, business, finance and across government. For investors, this net-zero journey has started out as a big hairy audacious goal with light up-front due diligence but very heavy back-end-loaded future commitments. Fulfilling these commitments will require a joined-up response. The current measurement model must move on from the grip of the benchmark into a new balanced scorecard regime which respects systems-thinking principles. If you want something new, you must stop doing something old.

Measurement

We turn to Ayelet Fishbach's perspectives in 'Get it done'[6] for our third area of fresh tracks to take. Her key framing for effective measurement is the triad: clear goals, holistic check-ins, and open accountabilities. The clear goals need to be 'SMART' but by a more modern schema than the traditional set[7] in that they are systemic, multiple, agile, reflexive and transparent. In this systemic and multiple goals framework, the goals are often soft. The elements of change show up in the agile and reflexive check-ins and transparency shows up in the accountabilities.

Allowing for the holistic picture in all of this is complex. But the alternative of over-simplifying is vulnerable to gaming and misrepresentation (think greenwashing). Mitigating these hazards introduces the need for transparency and accountabilities to be protected, which in turn elevates the importance of strong organisational culture. Cultures that are accurately presented, authentic and widely bought into. This ensures the *doing* is far more powerful than the *saying* or, put another way, the performativity does not overtake the outcome. In practice, it removes the convenient bolthole of keeping to a net-zero pathway by selling fossil fuel stocks, but not moving the climate-change needle.

Covid as a unique catalyst

So, what has Covid done for us? We suggest we have not let this crisis go to waste in three areas – work, purpose and measurement – and where pathways to better outcomes have emerged. And it has opened our eyes to leadership becoming less about what leaders achieve themselves and more about the sense of purpose imparted to colleagues and the actions they catalyse in pursuit of this objective. This supports the need for more transformational leadership that inspires colleagues to change expectations, perceptions and motivations to achieve common goals. This inverts the leadership pyramid into a 'we' control not an 'I' command and flattens it to enable a more flexible, seamless workplace.

Leadership in the post-Covid environment is a lot tougher. It carries new expectations and requires a new form of judgement to navigate uncertainty and complexity. And it has to be zeitgeist friendly with a different style that is more in tune, empowering, agile and humanistic. Most of all Covid has reminded us of the power of collaboration and its centrality in building and maintaining organisational social capital. We all do better when we all do better together.

[3] *Drive,* Dan Pink, 2009
[4] A *'Superteam'* in TAI research is a team which combines diverse talent and is unleashed by great culture and governance to achieve outstanding results
[5] *Value(s)*, Mark Carney, 2021
[6] *Get It Done: Surprising Lessons from the Science of Motivation*, Ayelet Fishbach, 2022
[7] SMART goals have generally been defined as ones that are specific, measurable, achievable, relevant and time-bound. *https://corporatefinanceinstitute.com/resources/management/smart-goal/*

9
The future of social capital

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Never before in the history of work have we had more opportunity to design and improve how work gets done. And in the extremely competitive area of investment organisations where the assets are the people, we should not let this opportunity pass us by.

The early stages of this great work reset have been a mixed picture. There have been some wins with improved flexibility and digital connectivity but where work relationships, social capital and trust are central to good outcomes, we are not yet in the shape we need to be.

In investment organisations – which are quintessentially people businesses – social capital lies alongside human capital, intellectual capital (knowledge, process, edge) and financial capital as a key enabler of value creation.

Through the pandemic, social capital got squeezed with professionals turning towards maintaining connections with team members rather than building or maintaining relationships with newer colleagues or other indirect associates.

Coming out of the pandemic into the hybrid world professionals are still connecting with others less frequently, have smaller networks, and spend less time and effort on relationship building relative to before the pandemic. And with these lighter relationships we have shrunk the trust levels with associated costs to innovation and creativity.

To help reverse these trends, people and organisations will need to pay more attention to workplace interactions.

How social capital works

Social capital is a secret sauce that very subtly leaves its mark – when someone outside your team pitches in to get you past a dead end, when mentoring produces a critical aha moment in your understanding of something important, when someone goes above and beyond with kindness when you needed it. All these are made possible when you've built a base of familiarity and goodwill through the previous serendipitous interactions of your work.

Social capital is the presence of networks, relationships and shared norms and how that is felt in terms of belonging, collaboration and camaraderie.

This produces the trust, goodwill and familiarity that when present gets more work done and does it better and faster. When professionals can trust colleagues, they tend to be more engaged, more willing to give extra energy, and more likely to stick around. Two data points from McKinsey[8] quantify that – those that are socially connected are one and a half times more likely to report a sense of belonging at work, and one and a half times more likely to report being engaged at work.

And then Great Place to Work research[9] clearly supports how the value created by trust translates into bottom line benefits – 2 to 3 per cent per annum higher returns to shareholders over a 26-year study.

The research suggests that relationships matter both in our closer inner ring ties and in our outer rings too.

In teams we have the close relationships that can be turned into social capital bonds – ties that make our work both better and more fun.

And outside our teams there are relationships in the outer reaches of our networks that are social capital bridges – that can bring special connections into our thinking. The challenge is both knowing where these bridges take us and making sure we make the trip.

Managing social capital

But the soft-to-measure and the slow-to-emerge aspects of social capital mean that these lessons are not easily learned. When we are wired to take most seriously those subjects that have the clearest data and quickest feedback loops, social capital with its soft data is too often neglected.

So, there is a twin challenge here – rebuilding social capital within a limited data environment and adapting the action plans to the hybrid model where organisations overwhelmingly see this as the way forward but are universally challenged by its novel features.

The baseline answer to these problems is for leaders to manage social capital in the same way they manage other forms of corporate capital: systematically and intentionally. While recognising this requires change and change is hard.

Leaders need to start by pinpointing the incentives and enablers that make social capital flourish. How are employees motivated to build and maintain relationships? Are they in a culture that encourages such relationship building and the trust and inclusion implied? Have they the time to spend on this and the knowledge of and the access to the networks they need?

Ideas to generate greater social capital cover a spectrum. First, the existing inner tie relationships can be tapped for more. Like spending more time in management check-ins on a more diverse agenda; more time with colleagues in coaching conversations; more time in mentoring situations. Those organisations that are committed to mentoring and see leaders as needing to be coaches have a very powerful employer edge.

Second, the existing organisational structures can be tapped for more social capital from the wider ties. We start with how group meetings can play their part in cross-fertilising ideas from different teams, so that the bridges across the organisation are stronger and more likely to carry traffic. For good teamwork, we need teams to come together to exchange their narrative and stories. We can also schedule time for lateral learning without hanging around water coolers by taking these conversations to more structured levels – through senior people – internal and external – sharing insights and experiences.

Third, we may need to develop fresh organisational design features. Two ideas come to mind. Creating fast-response agile teams to take on particular tasks – by getting a wider cross-section of people involved in these teams new relationships are developed. And adopting innovation hubs – ensuring ideation and creativity are given a better chance than in conventional structures.

Fourth, incentives always matter. So, making network quality part of the performance conversation is important and checking on an individual's progress with networks is part of that conversation about accomplishments and accountabilities. Leadership KPIs also can be used – making social capital a measure on the organisational dashboard you raise the bar naturally.

Finally, social capital can also be driven by developing your organisation's digital mind-set and skills in cognitive diversity – think of how trust can be secured by the influence of data and information on top of in-person inter-action. And social capital will respond well when individuals have the T-shaped skills that connect dots well.

These change activities are more likely to stick when leaders clearly and frequently communicate why changes are needed; ensure processes and systems reflect the changes; and most critically walk the talk themselves and model the changes.

Conclusion

Investment organisations face growing challenges on several fronts: attrition and hiring challenges, loss of inclusiveness and trust, difficulties from fatigue, and belonging. Improving social capital offers some clear off-sets to these issues for individuals and organisations

Paying more attention to this form of corporate capital can help organisations bring people back to the office, cultivate distinctive workplaces, and improve productivity—and ultimately create better overall organisational performance.

We now start a path back to 'systems' via a few pieces relating to investment practice. Our linking piece considers artificial intelligence (AI) which will absolutely need to be governed well, given its potential power to reshape the economy and investment. >>>

[8] *Network effects: How to rebuild social capital and improve corporate performance*, Taylor Lauricella, John Parsons, Bill Schaninger, and Brooke Weddle, August 2, 2022
[9] *The Business Case for a High-Trust Culture,* Great Place to Work Report, 2016

10
AI, humans and the new age of asset management

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Every generation throughout history believes it has lived in innovative times, and yet, every generation brings its own innovation and change. The reality is that defining what innovation looks like can be quite hard. Steve Jobs described it as 'putting a ding in the universe; Thomas Edison as 'finding a better way to do things'; and science fiction writer, Arthur C Clarke as 'going beyond the limits of the possible'.

For the asset management industry, innovation has been driven by the proliferation of data; advances in technology, including the widespread adoption of artificial intelligence (AI); and commitments to ambitious sustainability goals – all of which have caused significant disruption to the business, people and investment models of organisations.

Economist and Santa Fe Institute external professor, W. Brian Arthur, maps this digital and data revolution over the last 50 years[10] – from integrated circuits, processors and memory chips in the 1970s/80s; to the connection of digital processes and computers via the internet; to the development of magnetic, gyroscopic, radar and other sensors. The latter is critical as these sensors brought us oceans of data and it is estimated that the asset management industry has nearly tripled its spending on data since 2017[11]. The challenge for our industry today is how to make sense of it all, while providing benefits for its stakeholders, with the use of artificial intelligence playing a leading role.

The benefits of artificial intelligence to our industry cannot be understated and we see investors trying to harness its power through the use of natural language processing, image recognition and machine learning. From processing unstructured ESG data from alternative sources with the aim of assessing company risk; to using AI in private markets to source deals and conduct due diligence on businesses; to improved customisation of products and client experiences. We also see its benefits in improved trade-execution algorithms; searches for new sources of alpha through alternative data and the generation of synthetic data points and scenarios; and reduced costs for data management. Indeed, around 63% of banks and investment firms surveyed confirmed that they are currently deploying or already using AI, with a further 28% intending to deploy it over the next 1-3 years[12].

However, it is the development of generative AI – where machine learning models are trained to generate new content and data by training on existing data sets – that has caused divisions: the optimists who see the significant opportunities to drive work efficiency, allowing our workforce to do different, higher-value tasks[13]; the pessimists who emphasise AI's potential to propagate misinformation and create widespread disruption to jobs or even existential risk to human life; and those that are in-between who see lots of opportunities for AI's use but strongly highlight the need to mitigate and manage its risks[14].

Social technology generally lags behind the development of physical technology and, as such, we need to be aware of the risks and put in place guardrails, while embracing its benefits. We also need to not underplay the roles of human intelligence (HI) as a complement to rapid advances in AI use cases. Indeed the combination of AI + HI will be especially powerful if we are to learn the intrinsic limitations of this technology and adjust our part in this combination.

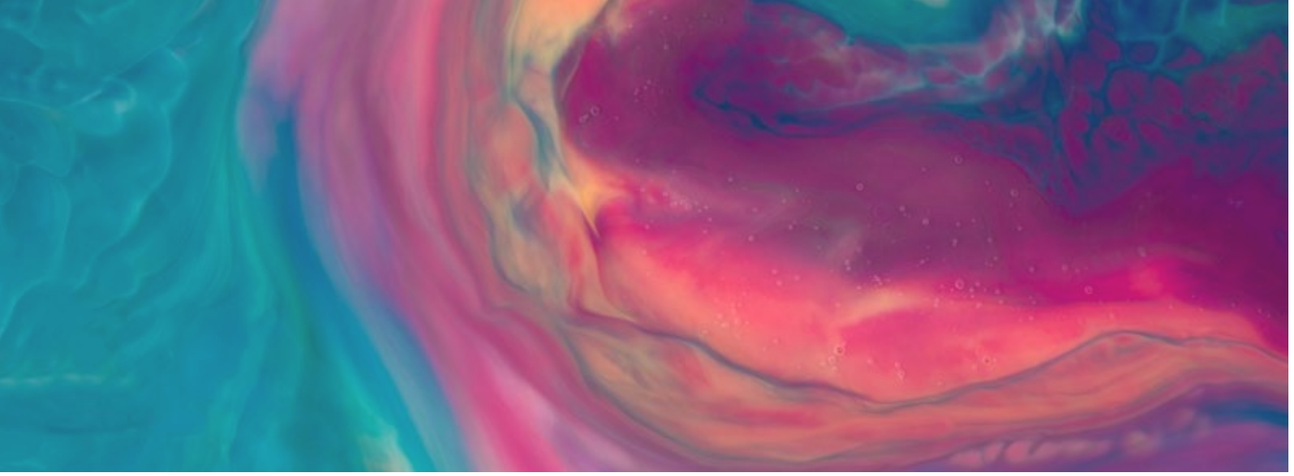
The reality is that AI cannot yet fully replicate human behaviour in all its dimensions. Traits such as creativity, empathy judgement and the ability to inspire others are very much the reserves of humans. We are also reminded that the skills of the future[15] are not just technical, but also include soft skills such as relationship and building social capital; leadership skills such as crisis management and instilling an ethical culture; and T-shaped skills including situational fluency and adaptability. And we also need judgement and inference skills to consider data in its full context where simple causality is not present in a complex system and where trade-offs need to be made between highly objective/valid hard data and softer more subjective data that may be more material.

Data science and analytics have become a vital part of the investment business. But the ultimate test of quality in data and technology will be related to the quality of decision-useful information and the connected insights, judgements, processes and algorithms applied to it. AI can indeed be a game changer for our industry – it is a systemic opportunity – but only if we are able to mitigate the risks that have and will come from multiple sources. It is the powerful combination of AI + HI that will truly deliver long-term value – enabling us to make better decisions quickly and more consistently, with the human touch.

The pieces we have chosen to feature under investment practice are relatively old, implying that we think they have stood the test of time. We consider what you can learn from thinking about aliens (please suspend judgement until you have read it). Then we appear to discuss tobacco-free portfolios, but in reality explore Keynes' comment that society has no liquidity (once a business is funded, society is stuck with it). Finally, we make the case for there being a premium to long-term investing. >>>

[10] *Where is technology taking the economy?*, Brian W. Arthur, McKinsey Quarterly, October 5, 2017
[11] Source: alternativedata.org
[12] *Gartner Data and Analytics Transformation Survey, 2022*
[13] See the 2023 National Bureau of Economic Research (NBER) recent working paper, *Generative AI at Work,* which points to a 14% productivity improvement, with the greatest impact on novice and low-skilled workers
[14] In a recent joint statement from the US Centre for AI Safety (CAIS), chief executives of leading AI companies, noted that the risks of AI should be 'a global priority alongside other societal-scale risks such as pandemics and nuclear war'. *AI Is as Risky as Pandemics and Nuclear War, Top CEOs Say, Urging Global Cooperation*, Billy Perrigo, Time Magazine, May 30, 2023

[15] *The investment professional of the future,* CFA Institute, 2019



11
Six things I have learnt from thinking about alien invasion

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Hopefully that grabs your attention. But I am not actually going to talk about alien invasion per se. Rather, the topic of this article is extreme risks – potential events that are unlikely to occur but that could have a significant impact on economic growth and asset returns, should they happen.

Extreme risks have always been of special interest to us in the Thinking Ahead Institute. Our belief is that, in a complex world, extreme risks are more likely than implied by most financial models. Moreover, we live only once, facing problems in series, not in parallel. So, when we are confronted with an extreme event, there is no going back in time and diluting the impact with other less negative ones. One must deal with its consequences. Plus, there's a nerdy appeal to having the intellectual freedom to debate what could happen if a hostile extra-terrestrial invasion were to occur...

We have just published our 4th report on extreme risks. The top three extreme risks identified in this latest update are global temperature change, global trade collapse and cyber warfare. It has been ten years since we published the first report in 2009 so I thought now was a good opportunity to reflect on my personal learning journey. Here are my six lessons learnt:

1 **Cognitive biases are powerful**
In a conference I recently attended, Richard Thaler, the behavioural economist who won the 2017 Nobel Prize in Economics, said people always refer to biases as "what other people do". We all think we are above average in avoiding those biases. And that itself is a bias. Back to extreme risks: in our report in 2009, we called out economic depression, hyperinflation and excess leverage as the top three risks. It's hardly surprising that would be the view in 2009. But were we over-weighting recent experience then? And are we doing so now? Could current concerns and headlines around climate change, trade wars and cyber warfare be drawing attention away from lower profile but greater existential threats?

2 **When it comes to extreme risks, physics envy is particularly harmful**
We knew this from the get-go: by definition extreme risks are infrequent so a quantitative approach is unlikely to be very informative. In 2009 we identified five risks (excessive leverage, depression, currency crisis, political crisis and protectionism) that were believed to have one-in-10-years likelihood. How long of a historical record do we need to build to have confidence, in a statistical sense, in this claim? Much longer than 10 years and probably a lot longer than anyone's career. And even if you successfully build a long enough history, by the time you have it, the underlying driving forces will have evolved so much that a historical distribution may become irrelevant to future outcomes.

3 **Understanding cause and effect is the way to go**
However, that doesn't mean we should give up on understanding these risks. Human intelligence is not limited to learning from observing the past (inductive reasoning); we are also capable of applying generalised truth to circumstances that have not yet occurred (deductive reasoning). Human civilisation has never experienced a climate change at 2°C and beyond. But that shouldn't stop us from trying to understand the potential impact of such scenarios. For example, we have knowledge of the ice-albedo feedback and other linear and non-linear climate feedback loops. We understand well enough the effect of rising temperature on sea level rise, on frequency of heat waves, on risk of rainfall extremes over land, on global population exposed to severe drought and on reducing crop yields. An event without historical precedent can still be learnt and understood.

4 **Turn your "unknowns" into "knowns"**
The more time I have spent thinking about extreme risks, the more I am reminded about what I do NOT know. Over the years I have found it useful to make a distinction between knowable parts of the "unknowns" and the unknowable parts of these "unknowns" because the ways to address them are very different. Dealing with the knowable parts requires intellectual curiosity and diligence. We can turn "unknowns" into "knowns" through collecting more information, building more sophisticated models and/or stronger theories and, of course, learning from others. By showing you a list of risk events that you have not thought about before, an opportunity arises to turn your "unknowns" into "knowns". It allows you to eventually construct hedging strategies to protect you from the risks you are unwilling to take.

5 **Addressing "unknowables" is about making a portfolio resilient**
On the other hand, "unknowables" are the knowledge that is simply out of reach at any point in time. There is no data or theory about them. They are unpredictable. They are the "black swans" in Taleb's terminology. Alien invasion is very much in that territory. But we shouldn't let this knowledge vacuum paralyse our decision-making. It is simply a reminder that our understanding of the world is always incomplete. The existence of "unknowables" means that resilience in an investment portfolio is at least as valuable as efficiency. Take the concept of diversification as an example. An investment portfolio with genuine diversity offers protection not only against unrewarded idiosyncratic risks, but also against our own ignorance.

6 **A mind-expanding exercise**
At the end of the day, I see extreme risks thinking as an exercise for the mind. They remind us that it is naïve and dangerous to cling to a single vision about the future. Yes, we do not know what the future holds. But our brains are more than capable of imagining multiple versions of the future. And that is the game that investing is ultimately in. As investors, we are trying to navigate a highly volatile, uncertain, complex and ambiguous world. In my view, the extreme risk scenarios described in our report(s) can be turned into useful material to facilitate a collective learning experience for your organisation. The scenarios are most effective when they are used, in a deliberately-created interactive environment, to make explicit – and to challenge – assumptions that underpin your investment portfolios or your business strategy[16].

When I worked on our first extreme risks report, never in a million years did I expect one day to be accused of "alien-washing"[17]. Seriously or not, it happened. It certainly wasn't an extreme risk – despite very low probability, the impact wasn't anything more than having a good laugh.

I do hope, however, that our analysis will be of some value in helping both to prepare for and to respond to extreme risks – whatever form they take.

[16] To truly harvest the power of scenario learning, we hope this Thinking Ahead Institute paper – *It's story time: The why, how and what of scenario learning – can help you*
[17] Quoting directly from this report – "Many of the initiatives that were identified seemed to resemble 'alien-washing'. For example, despite the fact that Towers Watson communicated on alien invasion as one of the top 5 extreme environmental risks, there is no evidence that this risk is considered in the context of investment consulting services offered by Towers Watson." *https://tobaccofreeportfolios.org/*

12
Tobacco-free portfolios: What's possible?

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I have previously quoted Keynes on liquidity: "there is no such thing as liquidity of investment for the community as a whole". In fact, this post is an extension of my previous post in which that quote appears – Should we deliberately strand some of our assets? We will deal with this macro position at the end. But first we need to lay out the ground work.

Arguably the movement to divest tobacco holdings from institutional portfolios can be traced to an individual (well, it makes for a better story – multiple influences within a complex system make for poor narrative). Dr Bronwyn King is an Australian radiation oncologist who was treating lung cancer sufferers and is now CEO of Tobacco Free Portfolios: "It was only during a meeting with a representative of her superannuation fund in 2010 that Bronwyn learnt some of her money was flowing to tobacco companies through the default option of her superannuation fund"[18]. This is a flaw in the narrative, but a perfectly forgivable one. No money was flowing to the tobacco companies. Existing ownership rights were being shuffled between willing buyers and sellers, that's all. Another quote from Dr King takes us back to the narrative: "In recognition of the profound death and disease caused by tobacco, there are 181 parties to the UN Tobacco Treaty, vowing to implement robust tobacco control regulations. In contrast, the global finance industry still invests in, and profits from tobacco. But this is changing...".

So we have an industry that causes harm (yes, it can be argued that individuals exercise free will and harm themselves – true, but we tend not to give knives and matches to very small children). There is therefore an ethical case against the tobacco industry. But most of the global finance industry operates under a fiduciary duty, which comes from a history of ethics-free, finance-only decisions. So what does the financial case look like? History shows that these have been extraordinarily successful investments – if customers are compelled to buy your product (physiological addiction) it shouldn't be too hard to make super-normal profits. So we will need to argue the future will be different in order to build a case against holding these assets. To me there are two, relatively clear components to the future returns. A very attractive stream of cash flows being thrown off by an existing business model supported by tied-in customers. And a very unattractive set of 'externalities' (essentially litigation or regulation) that could take most, if not all of those cash flows away. It would take a brighter mind than mine to combine those two elements into an expected value. My thinking would be more simplistic. I hold a diversified portfolio when I don't know which assets will 'go to zero' (but some of them will). But if I know that a tobacco asset has a positive probability of going to zero over my investment horizon (and the cumulative likelihood grows ever larger as the horizon lengthens) why hold it? Part of compounding wealth is about avoiding drawdown, and there are lots of other assets I could hold instead, so why take the risk? So I believe I can construct a valid, financial-sounding (but in reality, ethics-infused) case for divestment. All good, but we are not done. There are bigger fish swimming here.

Back to Keynes. I can divest tobacco from my portfolio, but society can't. If I sell my securities, I can only do so if there is a willing buyer on the other side. And so the tobacco business model continues largely unimpeded. It's just that the returns and the risks now affect someone else's portfolio. As a bit of an aside, Dr King's superfund contributions were not funding this industry. But a previous generation of financial industry participants did fund it. Only back then, there were credible claims that smoking could even be good for you. The learning points from this aside would include humility regarding the limits of our knowledge, and the importance of genuinely long-term thinking. It is better not to fund an industry that causes harm, than to try to shut it down when it exists (and can lobby). But this would represent incredible foresight.

Back to the main narrative. This, the shuffling of ownership but continuation of operations, is not the result that Dr King desires, I presume. It can be argued that if enough people decide to divest there is an impact on the cost of capital to tobacco companies. Fine, but (1) they are no longer allowed to give money to advertising agencies, and (2) there is no point in capital expenditure to expand production. In short, they don't need capital and so are unlikely to be bothered by a higher cost of capital. The truth is, tobacco is a dead business, and everyone knows it. You can in fact make a case that the returns from tobacco went from merely excellent to extraordinary at the time it became generally recognised that it was a dead business. This was nothing to do with the cash thrown off by continuing operations other than return it to shareholders. So, for me, divestment doesn't achieve what it is aiming for – the ending of this form of human suffering. The answer is to shut down the business model – which would entail a deliberate choice by brave shareholders to strand (short-term) financially attractive assets. Or..., or.... we could persuade governments to nationalise the tobacco companies. This would give society the liquidity, the out, which is otherwise only achievable by stranding. And it would allow a government to manage the asset-liability problem as it saw fit, over the time horizon it deemed practical.

My final point relates to scale. Tobacco is a $517bn problem (global market cap). To me, fossil fuels are the same type of problem but an order of magnitude bigger ($5trn). To the extent that we were able to agree that fossil fuels equally cause human suffering (or are about to), then we have exactly the same private divestment vs public externality problem. Therefore, we should probably start thinking about engaging with governments to nationalise fossil fuels under a mandate to wind them down. The private capital windfall could then be applied to funding new industries – hopefully with greater knowledge of potential future externalities.

[18] https://tobaccofreeportfolios.org/

13
The search for a long-term premium

CLICK HERE FOR ORIGINAL ARTICLE

Jaap van Dam, principal director investment strategy at PGGM, one of the world's largest asset owners that is known for its commitment to long-horizon investing, once asked what he called 'the million-dollar question': "can we be reasonably certain that we will be rewarded for being a long horizon investor? Because, if we're not, then why bother?"

A sound answer to this question, as Jaap rightly put it, will determine whether long-horizon investing will really take off among asset owners.

Supported by the work we have done in the Thinking Ahead Institute, in particular the long-horizon investing working group, I would propose a resounding yes as the answer to this question.

In our paper, "The search for a long-term premium", we conclude that a sizeable net long-term premium of 0.5% to 1.5% per year, depending on investors' size and governance arrangements, can be exploited by investors with the appropriate mindset and skillsets.

Hunting for evidence of long-term premia is easier said than done. In an ideal world, we would run a regression of net investment returns against investors' time horizons. Sadly, to our knowledge, the data to run this regression does not exist due to a number of obstacles such as how to accurately measure the time horizon of investors.

As a result, an "indirect" approach was conducted, based on the belief that long-horizon investing offers investors both return opportunities and the possibility to reduce drag on returns. This led to the identification of eight building blocks of long-horizon value. Each is practical to implement, albeit with changes required to the investment process. Together, they provide evidence of a sizeable premium from long-horizon investing.

We can split these building blocks into strategies that: 1) provide long-horizon return opportunities and 2) lead to lower long-term costs and/or mitigate losses.

Let's start with return opportunities. A study that examined over 2000 highly-intensive engagements with over 600 US public firms between 1999 and 2009 produced some revealing conclusions. The study showed that engagements with investee companies generate, on average, positive abnormal returns of 2.3% over the year following the initial engagement – clear evidence of the benefits of being active owners to encourage investee companies to take long-term approaches.

When investors are willing to pay for liquidity – in other words, sell assets below "fair value" – someone on the other side of the trade gets paid. One study suggested that long-horizon investors have the potential to earn additional returns of 1% pa at the expense of shorter-horizon investors by providing liquidity when it is most needed.

Another aspect of liquidity involves the illiquidity risk premium (IRP), which is well established as a source of return for long-horizon investors. When investors accept illiquidity, they accept greater uncertainty about the outcome because they are less able to liquidate the asset. The longer the capital is tied up, the more return investors expect by way of compensation. Academic studies point to a range of 0.5% – 2% pa for this particular premium – and even higher returns might be available to very long-horizon investors.

A fourth return opportunity for long-horizon investors comes from exploiting various mispricing effects via smart betas. Decades of data suggest that this can add more than 1.5% pa relative to the cap-weighted index.

Investors have long been aware of thematic investing. A belief that education, renewable energy, ageing, technology and so on, are key value drivers, is held by many investors. The lack of consistency in implementation approach means we have been unable to find empirical evidence that categorically demonstrates the success of a thematic approach. However, belief in thematic investing is certainly strong: 93% of attendees at the 2016 Thinking Ahead Institute New York roundtable believed that it was possible to enhance portfolio value by investing thematically.

A long-horizon mind-set can also usefully guide behaviours to reduce drags on investment returns.

A study of over 400 US plan sponsor "round-trip" decisions (firing and replacing managers) between 1996 and 2003 compared post-hiring returns with the returns that would have been delivered by fired managers. It suggested that by replacing their investment managers, the plan sponsors on average gave up a cumulative 1.0% in the three years following the change – a dear cost they paid for buying high and selling low that can be mitigated by a long-horizon mind-set.

Open-ended fund structures, despite the flexibility they provide, might not be fit-for-purpose for long-horizon investors who do not require nearly as much liquidity as other short-horizon shareholders. In such a structure, long-horizon shareholders effectively subsidise their short-horizon peers for their liquidity needs. One study found that liquidity-driven trading in response to flows (in particular redemptions) has reduced returns in US open-ended mutual funds by 1.5%-2.0% pa from 1985-1990.

Last but not least, significant savings in transaction costs can be made by avoiding unnecessary turnover as a long-horizon investor.

Capturing the benefits of long-horizon investing is likely to require a major shift of mind-set and significantly expanded skillsets by investors. In many cases, it entails incremental spending – eg expanding investment expertise in active ownership by hiring a specialist, or increasing the number of trustee meetings to strengthen long-horizon investing beliefs.

The potential benefits of this additional spending are in many cases return enhancements. In the paper we take two hypothetical pension schemes to develop a reasonable estimate of the potential long-term premium in practice.

The smaller fund focuses its long-horizon efforts on avoiding costs and mistakes. It reduces manager turnover, avoids chasing performance and forced sales, and moves part of its passive exposure into smart beta strategies. The rationale is: if you don't have the resources to win big, at least don't lose. The net benefit of these efforts is potentially an increase in investment returns of about 0.5% a year.

The larger fund has the governance and financial resources to consider all available options for capturing premia. It introduces long-horizon return-seeking strategies while reducing its exposure to mistakes and costs. The net uplift to returns is potentially around 1.5% a year.

In the investment world where there are very few universal truths, it would be hubristic to conclude that we have proven the existence of the long-term premium. We are, however, "reasonably certain" that the costs of developing the mind-set and acquiring the skillsets to address long-horizon investing challenges are substantially outweighed by the potential return enhancements.

If such a premium exists, why are institutional investors not already exploiting it? Our next challenge is to understand the potential obstacles, and, finally, present a range of practical solutions for investors to access that premium.

Having successfully conducted the search for a long-term premium, we now embark on the journey towards building a long-term orientation.

Our route from investment practice back to systems is via an idea to divide business models into two categories. One to be managed as going concerns, the other to be actively managed into obsolescence. >>>

14
Good index, bad index

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This piece started with the idea of whether we could use the good bank, bad bank construct as an analogy within investment. Further thinking and some initial discussions suggests there might be something in it.

Formalising the bad bank analogy

Wikipedia defines a bad bank as a corporate structure which isolates illiquid and high-risk assets held by a bank. The goal of segregating the "good" assets from the "bad" assets is to allow investors to assess the bank's financial health with greater certainty. A bad bank structure also permits specialised management to deal with the problem of bad debts.

If we port this idea to investment, what would it look like if we split the market cap index into a good index and a bad index? Would that give us greater clarity on appropriate valuations? Would it more effectively starve bad index constituents of capital? Would, or could, the bad index portfolio be managed differently?

A failure to think ahead

A little further thought shows that the investment world has already started to do this. BlackRock's new focus on sustainability includes the decision to remove "from our discretionary active investment portfolios the public securities (both debt and equity) of companies that generate more than 25% of their revenues from thermal coal production[19]". So having more than 25% of your revenue come from thermal coal makes you a bad business; 25% or less a good one.

Or there is FTSE and the Church of England creating the FTSE TPI Climate Transition Index. Here the definition of good is having public targets aligned to the Paris agreement, so Shell and Repsol are in the index while ExxonMobil, Chevron and BP are not[20].

However, both these case studies are informal, or partial, applications of the bad bank analogy. After separating the good and bad, only the good will be held, monitored and managed. But the bad assets still exist. And a formal application of the analogy would see them subjected to specialised management.

All things are possible...

The DSM case study can offer us hope. DSM was a coal miner (Dutch State Mines) which transitioned to petrochemicals, and then transitioned again into its current form as a health, nutrition and materials business. The first transition occurred under state-ownership and may have been a necessity (the last mine closed in 1973). The second transition occurred under private ownership and, given the timing of acquisitions and divestments, may have been a deliberate strategy operating under foresight. So, leopards may not be able to change their spots, but coal miners can become health companies.

...but beware the fallacy of hasty generalisation

However, just because one coal miner transformed itself into a health company we cannot conclude that all fossil fuel companies can. This could also be an example of survivorship bias. We do not know how many coal miners attempted to transform, and therefore we do not know the failure rate.

This seems like a good point to return to our bad bank. The assets in the bad bank are bad assets. They are loans that should not have been made (the benefit of hindsight). Once, they were deemed to be worth 100 cents per dollar of loan. They now reside within the bad bank because no-one now expects them to pay back in full. The management game is now to minimise the losses. We have left behind the era of maximising returns. I imagine the management now gets labour intensive – conversations with individual borrowers about how they might change their behaviour, and in so doing protect the lender's position as far as possible.

All analogies break down at some point, but I think ours holds for the moment. There is a set of bad business models[21], but at the time they were funded they were not considered to be bad. It is only with the benefit of hindsight that we can state the capital should not have been allocated. So far, so good. However, what makes these business models bad? Is it that we no longer expect them to return 100 cents per dollar of capital provided (the analogy is precise)? Or are they bad because we now judge their impact to be unacceptable, despite them continuing, for now, to provide an acceptable financial return (the analogy is much looser)?

What does continue to hold, in my opinion, is that the management game changes. It becomes very labour intensive, involving deep conversations with individual company managements about managing the bad business model down to zero. The managements may have individual incentives to resist decline – or even grow the bad business model.

But what about fiduciary duty?

We are currently in thought experiment territory, rather than dealing with reality. Also, I persist in differentiating between business models and companies. So, I am assuming that in most cases a company has a mix of business models, particularly large companies.

Further, I am taking it as given that we would prefer to bequeath a +1.5C world to our grandchildren rather than a +3C world, provided it doesn't cost us too much. And if it were financially beneficial to us, then we would absolutely prefer to hand on the cooler planet. Here, I am assuming that a business model that sells fossil fuels for burning will be shut down sometime before 2050.

Combine these two assumptions and the conversations with an oil major would be about managing the mix of their business models through time – presumably growing the renewables business model (but could be a new health division!) while shrinking the sales of fossil fuels for burning.

The fiduciary duty question then becomes whether this strategy better preserves, or enhances, financial value relative to an alternative path. The most obvious alternative is business as usual, in which company managements decide how fast they can sell fossil fuels for burning, and for how long. The dangers here include the already-mentioned incentives, and cliff-edge legal risk.

A potential global defining moment

On 27 February 2020 the UK's high court found that the ministers' failure to take into account the UK's climate change commitments made the Airports National Policy Statement unlawful. In plainer speak, Heathrow will not now be able to build its third runway. Adding capacity for more flights is not compatible with achieving climate change commitments. The significance of this ruling is enhanced by the UK's hosting of CoP26 (delayed to 2021). It could be seen in time to have been a defining moment.

Applying this to our current argument, it seems feasible, if not likely, that the selling of fossil fuels for burning could, at some point, be deemed unlawful. And if that were to ever happen, it would not only be future revenues that would suffer. There would be compensation cases brought looking to claw back previously booked financial returns.

Back to the indices

We are now ready to start thinking about constructing our good index and bad index. There will be technical aspects to address, some of which we will not have anticipated at this stage. There will also be the really hard aspect – defining what is good and what is bad. Here we give one thought on each area. Clearly much more thought will be needed if this idea is to be taken forward.

Regarding the technical, there is choice between threshold and proportional representation. The threshold approach would assess each company against some metric and then allocate all of that company's securities to the good index or the bad index. The proportional representation approach seems to sit better with the concept of a mix of business models, as it would allocate a proportion of securities to the good index, and the remainder to the bad index depending on the business model mix.

As for defining good and bad, the simplest approach would be to have a single issue, such as climate change. Even here very hard decisions will need to be made. Does any level of positive emissions automatically imply 'bad'? And does the basis of assessment include scope 3 emissions or not? This simple approach would be equivalent to dropping 'SG' from ESG. It could be a means to an end, but would probably not be acceptable to those who, rightly, care about S and G issues. However, adding in multiple issues will force us into further uncomfortable decisions – how much child labour does it take to move a negative emissions security from the good to the bad index?

We will now spend a while exploring systems, purpose and value creation. This will build out a solid map which will aid our subsequent explorations of the E and S of ESG. >>>

[19] *Sustainability as BlackRock's New Standard for Investing*, Blackrock, 2020
[20] *Church of England joins passive push with climate index*, Financial Times, 2020.
[21] I am deliberately avoiding the term 'bad companies'. I am assuming the employees and, maybe, the management are well meaning and acting in good faith. It is not necessarily their fault that the business model is now judged to be flawed

15
Why the coronavirus crisis reminds us that we need to embrace a systems framework for investing

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"If you went through this pain and aggravation and suffering and you didn't learn, well then shame on us. Shame on us" – Andrew Cuomo, Governor of New York, April 2020

I am writing this from a somewhat dark place. The world has changed so much around all of us, it is difficult not to feel a sense of grief. Grief. A word that feels justified given the loss that has affected so many, and the uncertainty and fear of what is yet to come. At the moment, any sense of returning to old normalcy feels naïve. The world around us will be different – but what scares me the most is that, as an industry, we come out of this the same.

It was a late April afternoon when I overheard the daily briefing from New York Governor, Andrew Cuomo. Cuomo was calling for a fundamental change to how society worked – changes to politically sensitive areas such as the environment, transportation, social justice and income inequality. He pleaded: *"If you went through this pain and aggravation and suffering and you didn't learn, well then shame on us. Shame on us".*

It gave me goose bumps.

Covid-19 has revealed some fundamental design flaws in our global economy. We have built our societies on the back of the growth imperative and therefore relentlessly pursued economic growth, and the efficiency of that growth, at all costs – not only at the expense of the environment but also at the expense of people, most evident through widening levels of inequality in our society. The myth that this virus is the great leveller has been widely dispelled and the crisis has savagely emphasised the gulf between the haves and the have-nots. It is much, much harder to deal with the worst effects of the virus if you are poor and it is the key workers of our society who, in general, seem to be the most poorly paid.

These design flaws need to be fixed and I believe the investment industry has a role to play. Not least because we are an industry that oversees around USD $100 trillion of capital on behalf of billions of people on this planet and our investments have an impact on society, but also because social, environmental and financial issues are so globalised and interdependent that disruptions to these create systemic risks for capital markets and investors.

The coronavirus crisis reminds us that we need to embrace a systems framework for investing and improve our understanding of the context in which our portfolios exist.

A systems framework for investing

We can start by looking at how our investment organisations contribute to long-term value creation. Kate Raworth in her 2017 book, *Doughnut economics,* describes value creation by looking at humanity's long-term goals where there is a "social foundation of wellbeing no one should fall below, and an ecological ceiling of planetary pressure we should not go beyond".

Achieving this implies that organisations need to bring more stakeholders into their value creation boundaries – broadening definitions of *value creation* outwards beyond shareholders and clients, to embracing employees' well-being, wider society and the planet. Impact lies at the core of the investment industry's societal purpose and its potential for value creation – it therefore follows that our license to operate rests on taking responsibility for and managing that impact. And our license should only be maintained if the industry creates and communicates some value for wider society.

Now more than ever, investors need to move towards a systems framework for investing which recognises that our businesses and portfolios cannot be considered as independent from wider society or the environment. They will affect (and be affected by) both of them – for better or for worse. A systems-theory viewpoint starts with the idea that the returns we need can only come from a system that works. This results in the creation of investment policies that work directly on ESG and sustainability (both of investee companies and the system). These objectives impact real-world outcomes, which shape investment results. In other words, we need to move beyond the shallow mapping of sustainability factors onto investment outcomes to more holistic and reflexive policies that focus on the intentionality of the investor to produce positive real-world outcomes and therefore sustainable investment results. This is what it means to be a purposeful investor.

Universal owners: the most influential capital on the planet

Moving towards a systems framework for investing not only means that stewardship of existing assets really matters, but it also means that our provision of new capital needs to be directed towards investments that support a sustainable future. The crisis is another reminder that this reallocation of capital may be sooner than we previously thought.

Large asset owners have a unique role to play in influencing systemic issues. Universal owners are very large, long-term, leadership-minded organisations which, because of their size, hold a slice of the whole economy and market through their portfolios. These asset owners are exposed to global challenges, and opportunities to influence their outcomes lie in integrated management of the market exposure of the investment return.

Universal owners provide a natural base of investors who can understand and manage systemic risk through their investment strategy. But they are also well-placed to play a more influential role in safeguarding the financial system and contributing positively to big societal issues. In other words, they can "do well while doing good". These asset owners are deliberate in aiming for impact ('intentionality') through their ability to produce positive system effects ('additionality').

Smaller asset owners can also influence the system by selectively employing universal ownership strategies within their portfolios. Often these funds are motivated by mission, values and beliefs considerations and need to exhibit the intentionality to influence and impact the system. This can be done through collaboration with other larger asset pools or through delegations to asset managers.

Asset owners therefore need to get better at identifying and measuring the performance of their managers in addressing systemic issues (not just in terms of pandemics but also, for example, the coming cataclysm of climate change). This can be achieved in part by shifting their focus to principles-based evaluation of managers instead of the current verify and analyse model. This starts with an evaluation of whether principles and beliefs (i) are clear, meaningful and actionable, (ii) are actually being followed (intentionality) and (iii) lead to the desired results (additionality)[22] .

Sharp investors are increasingly aware of the impact system-level issues such as climate change and inequality can have on their investments. The sooner we all realise that future wealth and prosperity are worth more in a world worth living in, the more likely we are able to create a better future for us all.

[22] See The Integration Investment Project's (TIIP) paper, *Assessing System-Level Investments: A Guide for Asset Owners,* 2019, for an excellent exposition on principles-focused evaluations.

16
Past returns aren't even a good guide to the past

CLICK HERE FOR ORIGINAL ARTICLE

The argument in this piece is simple, but relatively aggressive: past returns are too high because they were based on false profits.

The Institute's work on value creation led us to propose the concept of a value creation boundary. Value is created inside the boundary and is destroyed outside it. There is discretion as to where to draw the boundary. Drawing a tight boundary concentrates the value created for the fortunate insiders, and means the value destruction for any particular bystander will typically be very dilute. So dilute, perhaps, that they do not even realise they are suffering any value destruction. However, collectively – and over time – the value destruction accumulates and becomes highly visible.

Taking this from the abstract to reality, our lived experience has been within an environment of shareholder primacy, which is nothing other than the drawing of a very tight boundary. Shareholders were the insiders and everyone and everything else fell outside. Now the value destruction has accumulated and is staring us in the face. It is the carbon in the atmosphere, the plastics in the oceans, the phosphorus and nitrogen in our rivers and lakes; it is also visible in the fight for living wages. In fact, if you are willing to allow me some slack I would argue that the UN's sustainable development goals are a manifestation that the economic machine has caused multiple problems for the masses lying outside the boundary.

So far, so clear. But what has this got to do with past returns?

The value destruction outside the boundary is simply different language for the term economists use – 'externalities'[23]. Both versions refer to the dumping of waste into environmental sinks, rather than paying to dispose of it cleanly. In other words, the true cost of production in our economic activity was understated, and hence profits were overstated. It is therefore my contention that past returns were inflated relative to what they should have been, based on these false profits[24]. In effect we have run down our natural resources and converted them into financial returns, as if that was normal behaviour. It is, in fact, theft: "[An externality] is theft. That's a loaded term, but if anyone can come up with a better term for taking something from people without their consent and without compensating them, I'm happy to use that term."[25]

All this would be of no more than academic interest if nothing was likely to change. If we can continue to avoid accounting for the true full cost of production, who gets to declare that the profits are false? So, can we continue to costlessly dump our waste into environmental sinks? It is my belief that the sinks are now full or, with a global population of 8bn people, will be full in short order. And by 'full' I mean in a practical, rather than literal, sense – it will be perfectly possible for greenhouse gases to further accumulate in the atmosphere long after most biological life, including us, has gone extinct.

If the sinks are full, then the cost of waste disposal will need to be internalised and profits will fall. And what if society demands that the sinks be cleaned? Hold that thought...

Does the overstatement of past returns matter, and should we care? To answer this question I will simply quote from the FT's Moral Money email of October 2, 2019: "the influential Wall Street lawyer Marty Lipton argued that business was underestimating the potential litigation risks associated with ESG issues. "When significant costs to society from climate change and the depletion of resources are tallied, as they will be, an armada of regulators and plaintiffs' lawyers will appear," he warned. ... risks were far from abstract, Lipton warned: directors may be held personally accountable if their oversight was deemed in hindsight to have been insufficient." So, even if we leave aside the moral aspects, and look at this question purely in financial terms, it looks like shareholders should care as returns could be clawed back. And directors should care a lot.

In summary, it is my belief that past returns were over-stated. The implication is that future returns will be lower[26]. It might be possible, as with the global financial crisis, to get taxpayers to pick up the internalised costs. But taxpayers are also employees and customers, so it is hard to see how corporations dodge the bullet completely. It turns out that drawing the value creation boundary tightly, and acting as if the earth can absorb limitless amounts of waste, is not a game we can keep playing forever.

[23] Properly viewed through a wide frame and over a long horizon, there is no such thing as an externality in a closed system
[24] The only way for past returns not to have been inflated would be if market prices already incorporated the knowledge that profits were overstated, and had done the adjustment for us
[25] *What Would Milton Friedman Do About Climate Change? Tax Carbon, Jeff McMahon, Forbes,* October 12, 2014
[26] More accurately, total value created will need to increase for shareholders to retain the same amount of value as previously

17
POSIWID: the purpose of a system is what it does

CLICK HERE FOR ORIGINAL ARTICLE

The history

In the Thinking Ahead Group we have spent well over a decade thinking about investment as a system. We are at least as interested in the macro behaviour of the industry, as we are about the micro behaviours of the various agents. Then we formed the Thinking Ahead Institute with the stated purpose of changing the investment industry for the benefit of the end saver. In effect we wanted to encourage the industry to (re)align itself to better serve a social purpose – to strengthen its licence to operate.

The painful recognition

In 2017 one of the Institute's research streams was investment as an ecosystem. We held a couple of topical days as part of the exploration. One of my personal goals was to understand whether an ecosystem could have a social purpose. Professor Mark Pagel was very clear that biological ecosystems had no intrinsic purpose. The fact that they happen to produce oxygen, tasty protein and recycle waste (amongst other 'ecosystem services') is very convenient for us humans. But nothing in a biological ecosystem is aiming towards those goals. He therefore suggested that this, ie an absence of over-riding purpose, was the starting point for considering human-made ecosystems, such as the investment industry.

Even with this helpful guidance, I still didn't get it. It has only been in pursuing our research this year into value creation that I have run into the acronym POSIWID – the purpose of a system is what it does. I think I get it now. But the realisation that I am a slow learner has been painful.

What does it mean?

The essence of POSIWID is to counter the notion that we can infer the purpose of a system from the intentions of those who design, operate, or regulate it. The originator of the phrase, Stafford Beer, stated that it gave a better starting point for understanding (rather than attributing good intentions, moral judgements or even knowledge to the system). In turn, for the investment industry, this means two things:

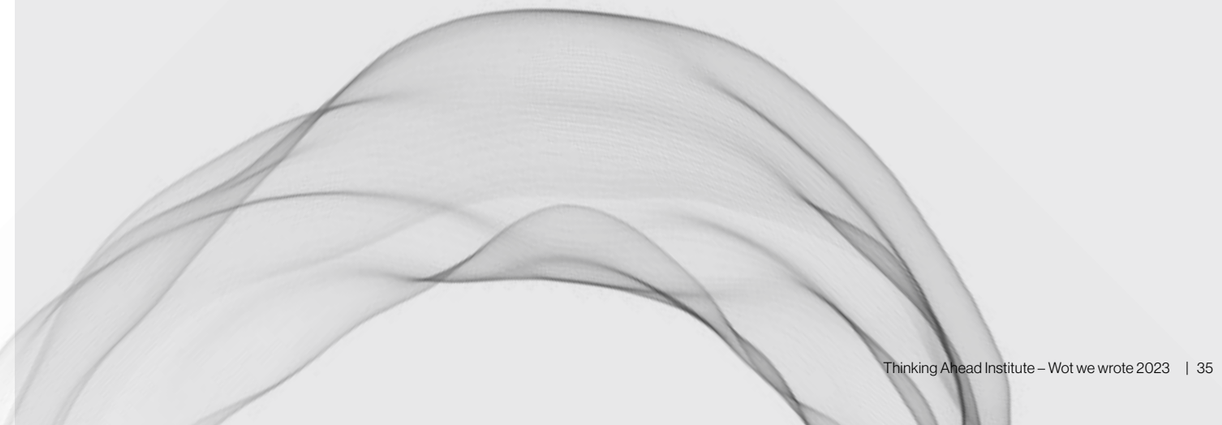
a) It is beyond the power of any agent, even a regulator or a government, to impose a social purpose on the industry, and

b) If we want the investment industry to pursue a better social purpose, then we need to change what the industry does.

Where to from here?

I believe that POSIWID is a powerful insight for us and the working group to consider in the value creation research this year. For example, in response to the first point above, we should accept that no single agent can impose a purpose – but that doesn't mean an absence of influence. Could a sufficient number of purposeful investment professionals influence a sufficient number of investment organisations to change the industry? How large might that coalition need to be, to be successful? How much effort should be spent persuading regulators or governments to add their influence?

And the second point above is potentially deep, and throws off a number of questions, such as: what do we think our industry does? What does our industry actually do? If these answers are different, why is that? (Spoiler alert: I think the answers will be different, because we think our industry still does what it once did, such as allocate capital, but the passage of time and the adaption of the system means what we actually do is now different (listed equity markets are now net returners of capital)). What should our industry be doing? And what would we need to change to accomplish that?



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Is a market solution what we need?

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I have had the privilege of serving on the World Economic Forum's global future council for investment. In that context I also had the pleasure of working with Alison Tarditi, CIO of Australian Commonwealth Superannuation Corporation. Our joint opinion piece, *Want investors to care about natural resources? Put a price on them,* [27] has just been published. However, in the 18 months or so since the first draft, my thinking has evolved. Hence this thought piece.

Markets and prices

Even though we now probably view markets and prices as inseparable, markets actually pre-date prices. Although, in non-price form, we may prefer to call them exchanges. How many piglets can I take home to raise, in exchange for my full-grown pig? In essence we are saying there is a meaningful difference between an exchange rate and a price. If there are a gazillion-and-one goods in the world then there will be a gazillion exchange rates for converting my full-grown pig into something else.

In this framing, price is just one of the exchange rates – but a special one. It is the rate of exchange between full-grown pigs and that strange, non-edible substance called 'money'. It is the invention of the abstract concept of money that allowed us to move from exchange to price. In doing so we drop a gazillion-minus-one exchange rates and just keep the price. When we do this for all objects we enjoy a massive leap in efficiency (or, equivalently, a massive drop in transaction costs).

Efficiency is good, right?

I am currently struggling with a question of whether we have over-prioritised efficiency at the expense of other goals like resilience. I think the main problem is we have never explicitly set our priorities.

What do markets do?

To explain, I would like to start with a question: is the combination of markets plus prices a neutral technology, or an intrinsically biased technology? By 'technology' I mean a method for doing or achieving something[28]; by 'neutral' I mean capable of being directed to achieve different goals, compatible with different values[29].

An intrinsically biased technology, on the other hand, cannot be redirected to achieve different goals. It does what it does. If we consider a market as a small-scale system, then we can invoke the phrase 'POSIWID' – the purpose of a system is what it does. In other words, a system does not follow someone's pre-ordained purpose.

So, what is it that a market does? Here we need to distinguish between securities markets and markets for goods and services. For securities, there is buying and selling but no net supply or demand imbalance. Here the purpose of the securities market is to discover the market-clearing price.

For goods and services markets, however, the price is normally a given (and often set by the supplier or seller) and so the market is more about discovering the supply or demand imbalance. This imbalance then triggers changes in the economy. In the short term that could be a price rise (or fall) but in the medium term it will be a change in the quantity supplied. This now gets interesting; an increase in supply means that either a factory has been expanded, or an existing production line has been re-tooled to produce more of the demanded good. Resources within the economy are reallocated. In short, I am arguing that what the market system does is reallocate resources within the economy. And because the market keeps doing this, the market is actually a search engine continually looking for the most efficient allocation of resources – given the prices it has to react to. For what it's worth, I believe that markets plus prices is one of the most powerful technologies ever invented.

I see where you're going – you think we are missing some prices!

Yes, exactly – and no. On the 'yes' side, the WEF opinion piece mentioned at the start calls for natural resources to be priced appropriately. They currently have an effective price of zero so the market will use them profligately. Set a positive price and we will use less of them.

On the 'no' side, I think there are two problems[30] that argue against the (relatively) simple solution of introducing some natural resources prices to solve our current problems. First, how do we set the price(s)? We will not spend long on this as the economics literature deals with price setting extensively. I will stress, however, that the market acts as if the price is correct. A single mistake in setting a price for one of our natural resources actually introduces a string of relative-price errors. The market will then incorrectly allocate resources given those pricing errors[31].

The second problem is whether we actually want the most efficient solution. I will suggest that we probably want a more balanced solution in which efficiency is but one element.

Promoting the importance of resilience

Why would I not want the most efficient solution? In a word, 'fragility'[32]. Efficient solutions are fragile because, by design, resources have been pared back to the minimum. We do not want efficient bridges or tunnels, we want over-specified versions; we want resilient versions that can withstand the never-seen-before storm. Given the stresses and strains lined up to greet us in the future, I increasingly find myself wishing for a resilient economy, and not an efficient one. A resilient economy has 'fat in the system' (redundancy, in the jargon), or is over-specified. I do not believe that markets or, more strictly, free-market capitalism can deliver resilience. It isn't what it does.

The answer is constrained markets

Adam Smith's second book[33] showed us the power of the market (invisible hand) to efficiently allocate resources. His first book[34] showed us that society needs to set the boundaries of the playing field within which the invisible hand operates. The purpose of the boundaries is to constrain the set of possible solutions the market can search through. And the point of that, is to find a solution that better meets society's goals than would an unconstrained search. The implicit belief here is that there is no set of prices that will naturally guide a market system to the same solution[35]. In a sense, I am arguing for re-regulation (including new legislation, where required). But I think that ship has already sailed – re-regulation is a given and will likely pick up pace[36]. So I guess I am arguing for a pro-active embrace of, and support for, re-regulation by the investment industry.

As an aside, two quick points: first, I am using the term 're-regulation' as I see this following a period of de-regulation which started in the 1980s with Reagan and Thatcher. Second, I am thinking of the economy rather than the investment industry. For consumer protection reasons, the investment industry didn't really experience a de-regulation phase.

What to do?

This thought piece takes as given that we have been over-using natural resources; it accepts that pricing them would ration their use somewhat, but argues that the market mechanism is not enough; we need more regulation. What do we as individuals or organisations in the investment industry do with this? The answer to that will lie on a spectrum between passivity and pro-activity. Doing nothing and passively observing the re-regulation unfold is a viable choice. Equally viable, and probably preferable, is a more active stance, encompassing:

- Developing the enlightened part of enlightened self-interest within our organisations
- Actively engaging with regulators and the public sector to propose and support high-quality re-regulation within the economy
- Actively engaging with investee companies to encourage enlightened self-interest as well as strategic shifts in the light of shifting societal expectations
- Reworking investment analysis to consider valuations in different scenarios (will my stake in an auto manufacturer be worth more or less in an electric world?)
- Commit new investment capital to growing new assets or businesses that provide solutions to society's problems/are more aligned with society's goals.

[27] *Want investors to care about natural resources?* Put a price on them, World Economic Forum, 2021.
[28] Traffic lights are a physical technology, while the rules governing behaviour at traffic lights are a social technology. Together they achieve faster traffic flow.
[29] The internet can be argued to be a neutral technology. It can be directed to achieve much that is commonly regarded as 'good', but it can also be directed to expedite the dissemination of things commonly defined as 'bad'.
[30] I am ignoring a third, deeply theoretical, problem relating to the completeness of prices. For example, the Arrow-Debreu model of 1954 suggests a set of 'state prices' exists, which allows the economy to find the best equilibrium, or most efficient allocation of resources. In this world, I could buy an Arrow-Debreu security that would pay me $1 in October 2029 if more than 25% of the world's population were vegetarian (which would affect the future price of my pig). There would also be a security for more than 24% vegetarian, and more than 26% vegetarian etc, and yet more prices for September 2029, and November 2029 etc. In short, the set of prices required for the market to do its job properly is close-to-infinite. Adding a few more prices for some natural resources doesn't help us much.[31] The allocation could be a lot better than our current allocation in the absence of those prices – but there is a lot that we don't know here (and it may be unknowable).
[32] Nassim Taleb explored fragility and its opposite in social and financial contexts in his book *Antifragile: Things That Gain From Disorder, 2019*. The key idea is that antifragility is preferable to resilience or robustness; antifragility doesn't just weather the storm, it gets better.
[33] *An Inquiry Into the Nature and Causes of the Wealth of Nations*, Adam Smith, 1776
[34] *The Theory of Moral Sentiments*, Adam Smith, 1759
[35] Invoking POSIWID again, the point of a capitalist system is to maximise the return on financial capital.
[36] Among the many examples are (i) the UK's ban on sales of cars with internal combustion engines after 2030, and (ii) the success of the 30×30 movement leading countries to legislate protection of 30% of their land and sea areas

19
Mobilising capital to secure a sustainable future

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The Thinking Ahead Institute has completed its first five years. It set out with the ambitious goal of changing the investment industry for the benefit of the end saver. As a stated purpose it had many positive attributes, not least of which was its ability to unite good people. And our industry has a lot of good people in it. Its main drawback, however, was the lack of specificity. A multitude of research projects could be argued to be the interest of the end saver. Not wrong, but not focused either.

A quick look back

Over the last five years the Institute has written 139 opinion pieces and 42 research papers on 10, or so, topics[37], and discussed them at 47 events. Did we do anything to help the end saver? Our instincts scream at us to answer 'yes'; our integrity requires us to be more circumspect.

Over the last five years, prices have come down for end savers, industry thoughtfulness and effectiveness has gone up, both issues that we have advocated for but cannot take any measurable credit for.

While the impacts on the system are difficult to attribute, perhaps the impacts on individual firms have been more evident. While we hope that we have engaged with the thinking in individual member organisations in a number of different areas, here we single out culture. We have had the privilege of working with multiple members on assessing and discussing their culture, and the manager research team at one major asset consultant (WTW, for the avoidance of doubt) has changed its process in the light of the Institute's research. We would argue that organisations working on their culture can only be good for the end saver.

The next five years

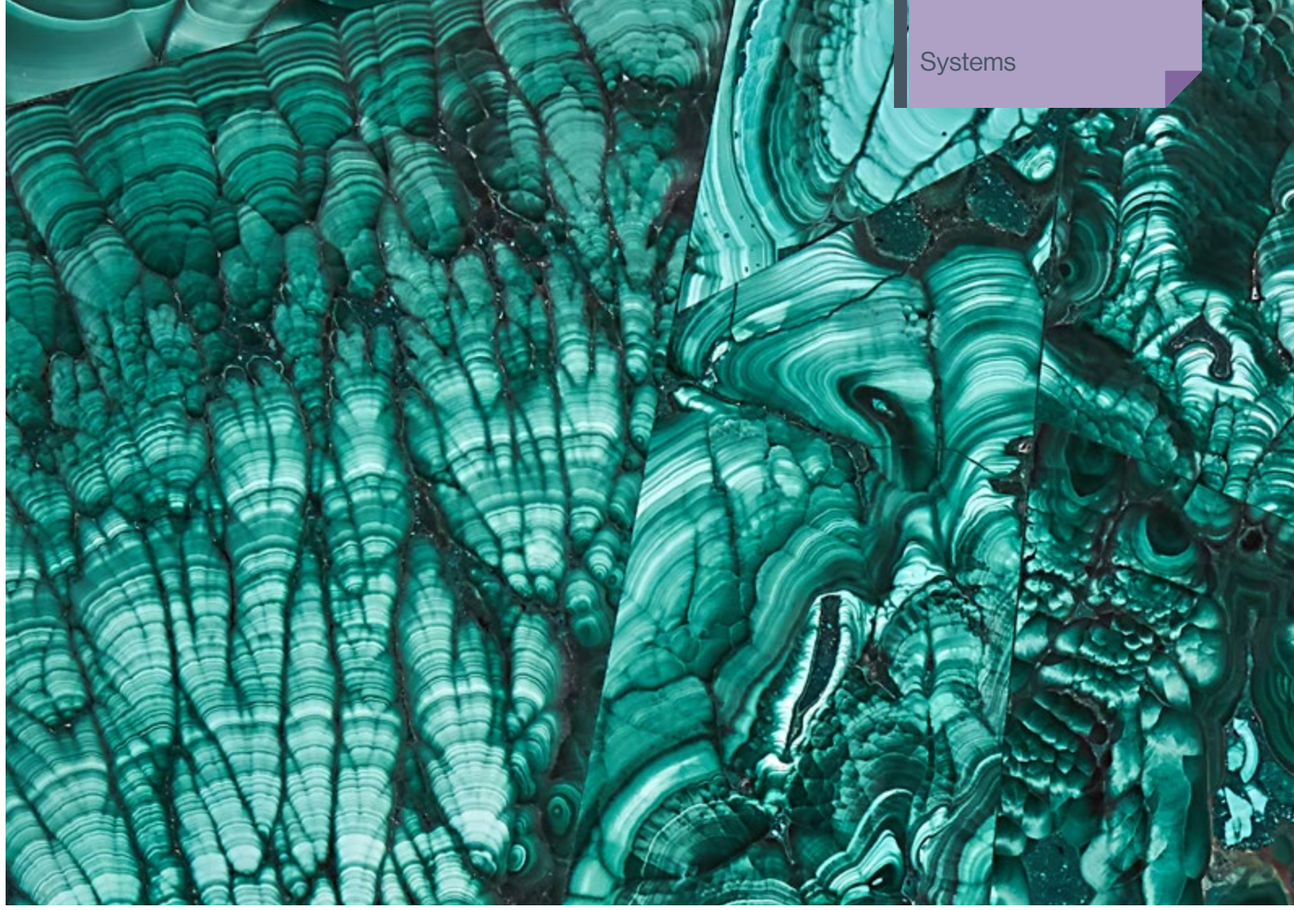
If you choose to use the words 'thinking ahead' to define you, then there is limited scope for retrospectives. The pressure is to be forward looking. In that spirit, the Thinking Ahead Group, the executive to the Institute, put itself through a strategy refresh process during 2019 in order to be ready to tackle the next five years.

Our heart remains with the end saver and the public good. We still believe the investment industry can deliver a better customer value proposition, and we continue to argue that the investment industry would be better and more sustainable for doing so. But our heads see the environment changing around us, and that change will intensify in the near future. At our June 2019 event in London we described climate as an already present emergency, not a coming problem.

Our two sustainability events in November 2019 were both sobering, but also inspiring – there are many in our industry who want to play their part in bringing change. It isn't just climate change of course. The loss of biodiversity, to us at least, has non-linearity written all over it. To date we have been able to wave goodbye to numerous species of flora and fauna with no apparent impact on our quality of life. At some point the continued extinction of more species will become obviously negative for us – our food, waste recycling and disease fighting capabilities all depend on healthy ecosystems.

Then there is the massive and multi-dimensional problem of inequality. We have deep sympathy with those who argue that this is the world's most important problem. We just happen to think that climate change is the most urgent problem – unless we deal with that, we won't have the opportunity to sort inequality.

So, to unite our heads and our hearts we decided to add a second purpose statement. So, for the next five years the Thinking Ahead Institute will be about:



Mobilising capital for a sustainable future.

In short, our best idea to help the end saver right now is to play our part in driving forward sustainability in all its forms for the benefit of the end saver and all stakeholders involved – basically every person on the planet.

What does 'mobilising capital' mean?

One of the definitions of 'mobilise' is to make something capable of movement. This is how we see our role. Our part is to provide the research and thought pieces that reduce any frictions preventing capital from moving to a better place. The sticking points are likely to fall into two categories – technical and organisational. The technical category will be about knowledge, beliefs and availability of appropriate vehicles of appropriate scale. The organisational ones will concern culture, values, purpose and vision.

The world – or, more precisely, humanity – needs to level off at a +1.5C economy but many scenarios suggest a trajectory towards +3C to +6C[38]. To quote Larry Fink's 2020 letter to CEOs "[in] the near future – and sooner than most anticipate – there will be a significant reallocation of capital"[39]. Capital will need to be withheld from harmful activities, and will need to fund and scale helpful ones.

And what does a sustainable future look like?

In the Thinking Ahead Group we have long argued that intergenerational fairness is a necessary condition for sustainability[40]. This is not a complete answer to what a sustainable future looks like, but the concept of intergenerational fairness is highly instructive. To the extent that we have enjoyed an endowment of natural resources, then our role is to pass on an endowment of equivalent value to the next generation.

What happens next?

The challenges associated with reallocating capital on the scale required are truly daunting. And yet we are excited too. Our five years of collective development have produced an Institute with formidable powers of creating and convening on the toughest challenges confronting us.

We have already had enough conversations with members to know that there is an emerging consensus on the importance of the work to be done; and that there is a strong desire from members to be involved with the co-creation task. We already have a long list of possible questions to apply our minds to. We will now take these forward with our member working group to add, refine and prioritise them. If you would like to be involved, please let us know.

[37] For those worried about our ability to count to even small numbers, this is a categorisation problem: is sustainability beliefs (a big piece of work) a separate topic to sustainability? Is our interesting-but-contained work on investment as an ecosystem significant enough to be called a separate topic?

[38] The Paris agreement of 2015 was to keep global temperature rise this century well below +2C, and to pursue efforts to limit the temperature increase even further to +1.5C
[39] *The Power of Capitalism*, BlackRock, 2020
[40] See, for example, *Bathtubs, intergenerational fairness and the sustainability end game*, Thinking Ahead Institute, 2019

20
Limits to growth?

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I have been reflecting on different forms of growth 'dynamics'. I can think of three types, but there may be more.

a) **Sigmoidal, or S-curve, growth |** growth starts slowly, accelerates for a while before decelerating to a zero growth rate. This growth dynamic explains why trees do not grow to the sky

b) **Exponential |** the growth rate is consistently positive up until the point of collapse. An example would be the growth of a colony of bacteria in a petri dish. There is a technical wrinkle concerning whether the point of collapse occurs in finite time (a problem for us) or in infinite time (we can ignore)

c) **Chaos |** the classic example here is the growth in the rabbit population on an island, with unpredictable booms and crashes.

The common thread across all three is access to resources. Growth stops when the resources can't be extracted from the environment fast enough. In the case of exponential growth, collapse comes when all available resources have been harvested.

This leads me to think about 'sustainability'. In the context I have just developed, sustainability becomes the art of extracting resources from the environment at exactly the rate at which they are replenished. Therefore I conclude that, over the very long term, the only sustainable growth rate is 0% per annum. This is not how we appear to be wired – we seem to be wired for growth – so how do we explain this mismatch? Two different strands of thought occur to me.

First, there is history. For the vast majority of human history global GDP growth is estimated to have been between 0%pa and 0.05%pa, and then around 1750 it exploded exponentially. This growth pattern would fit either the sigmoidal or exponential dynamics reviewed above. Arguably the former is the 'more sustainable' option – and it is possible to make the case that we could currently be in the deceleration phase. If global GDP is truly exponential, then reasoning by analogy would suggest that positive growth can be sustained until the resources run out, at which point it collapses. In this latter case we would need to define the time frame over which we were concerned about 'sustainability' and if the collapse is likely beyond this, then it is outside our frame of reckoning.

The second strand of thought is inspired by Eric Beinhocker's *The origin of wealth.* This book makes the case that wealth is knowledge – so more knowledge equals more wealth. Assuming this to be true, wealth will increase indefinitely if knowledge increases indefinitely. The indefinite increase of knowledge seems plausible, given that the more discoveries we make the more recombinations of them can be made, to yield yet further discoveries. There are two caveats in my mind. Again from history, the lesson from the destruction of Arab centres of learning shows that knowledge (and wealth) can be destroyed – even if that is harder to imagine now that knowledge exists in digital form. Second, for me, the problem of resource limits still needs to be solved. For knowledge and wealth to increase indefinitely it seems to me that both have to be free of any resource constraints – and that is hard for me to imagine.

To conclude, I am settling on a belief that over the very long run the only sustainable growth rate is 0%pa. Given my belief in complex adaptive systems, a steady state seems remotely likely. More likely would be a chaotic pattern of positive and negative growth rates. And, of course, it is possible that such an outcome is decades – or perhaps centuries – away; which somewhat devalues this line of thinking.

21
Bathtubs, intergenerational fairness and the sustainability end game

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fairness | *noun* | *impartial and just treatment or behaviour without favouritism or discrimination*

In this thought piece I explore the concept of intergenerational fairness. For us in the Thinking Ahead Group it is a necessary condition for sustainability. For example, I would argue that the lack of sustainability of the vast majority of defined benefit pension funds was, at heart, a failure of intergenerational fairness – with the current generation taking the credit for the assumed returns and the future generation holding the risk of the returns not being realised. I start with a thought experiment where a bathtub represents an endowment received by a generation and eventually passed on to the next. But before we dive in, a quick note on the language. I am using the word 'fairness' and have provided a definition above. I am not using the word 'equity'. As the father of a child with Down syndrome I do not have the luxury of treating my children equally. I am forced into the squishier and more difficult world of treating them fairly.

The thought experiment

I will use a bathtub as an analogy for intergenerational fairness. But let me begin with my preferred definition of sustainability. A resource or a system can be said to be sustainable when the rate of extraction equals the rate of replenishment. So the level of water in our bathtub will remain constant when the rate of inflow from the tap equals the rate of outflow through the plughole. Clearly, for long term sustainability we should put the plug in and turn off the tap – but that is simply setting both rates of flow to zero. And all analogies are imperfect.

We have created for ourselves a sustainable bathing environment. When we turn to consider intergenerational fairness, however, the waters get murkier. We are now ready to hand the bathtub on to the next generation. The simplest definition of intergenerational fairness would require us to hand over the bathtub with the same depth, temperature and quality of water as we inherited. This would be intergenerational equity. But, if we have used our 'bathing endowment' then under reasonable assumptions the depth will be shallower (we splashed, or carried some water with us when we exited), the temperature will be lower, and the water quality degraded. It follows that satisfying an intergenerational fairness test will cost us, in some way.

Regarding the depth, we would need to buy more water to replenish what we lost. If no more water is available, then the proper action is very careful stewardship of the endowment during our period of use. Similarly for the temperature, we will need to pay for the energy required to heat the water to the original level. When it comes to the quality of the water or, in less polite terms, removing the pollution then presumably we are in for significant cost. We either need to build a purification plant next to the tub to keep the quality constant, and/or we need the ability to remove all the water, clean the bath and re-fill with purified or new water. The point of this analogy is to show that when viewed through the lens of intergenerational fairness, the use of endowments are far from free. And just in case it is necessary to spell it out, the endowment we are really talking about here is any natural resource found within the earth's atmosphere.

From equity to fairness

So far we have used the simplest definition of fairness – like for like. Let's try something harder in order to introduce a second important point. In this case we realise that the time is approaching for us to hand on the bathtub to the next generation, but we decide that baths are for dinosaurs and the new generation would much rather inherit a shower. Instead of paying to top up and heat the bathwater, and to build the purification plant, we will instead pay to have a shower fitted. Yes, the next generation inherits a degraded 'bathing endowment' but they also get a brand new shower. The question is, is this fair? And the answer, I will argue, lies along a spectrum.

To simplify things, I will consider the analogy through two scenarios. In the first scenario our generation is virtuous, and in the second we are the opposite. Therefore, in the first scenario we can presume that we have strong cause to believe that the next generation genuinely would prefer a shower, and I will assume that we spend at least as much on providing the shower, as we would have done on restoring the bathtub to its original condition. This seems fair.

In the second scenario we are lacking in virtue, and so our motivations are cynical. In effect, we realise how much it will cost to restore the bathtub, decide we are not willing to make ourselves that much poorer for the sake of the following generation, and so spend the least amount possible on fitting a shower – and the PR campaign to convince the inheritors that they really do prefer showering. This is the unfair end of the spectrum.

Now we place ourselves in the shoes of the new generation. We know the previous generation only had a bathtub, and we know that we have a bathtub and a shower. We don't know, but we might suspect, that their water was warmer and cleaner. How are this generation meant to decide where to place us on that spectrum between fair and unfair? This is the second important point about intergenerational fairness[41]. Because of the multiple factors involved, and the changing of the conditions, it is extremely difficult – I suspect impossible – to definitively assess fairness. It will be a subjective and nuanced judgement most of the time. Unfairness will occasionally be obvious – and we will now get to that as we consider the sustainability end game.

The link to sustainability

I started this piece with my preferred definition of sustainability, but I need to qualify it slightly. We need to distinguish between the cases where unsustainable practices don't matter, from those that do. For example, we might completely exhaust a natural endowment. If we convert that endowment into a better set of assets or capitals for future generations (eg a shower!) then the unsustainable use of that endowment arguably doesn't matter. This connects to our point immediately above – how do you tell, in a complex, adapting system, whether your 'package of stuff' is better or worse than a different package at a different point in time?

Where sustainability does matter, and where intergenerational unfairness is obvious, is the 'end game' of this piece's title. Along with endowments of fossil fuel and rare earth elements, we also received an endowment of ecosystem services. These services are quite literally life support systems for us – and all other animal life. If we do not hand on intact ecosystem services to subsequent generations then we raise the prospect that there will be a final generation at some point. The hard logic of this, and I am sorry to go here, is the extinction of all customers at that point. And so the terminal value of all businesses within our portfolios is zero. The investment game is then about the horizon over which we can still expect to receive cash flows. If sufficiently long, we can leave the end game problem to a future generation and carry on as before. However, this looks a bit like a game of chicken to me.

The alternative is to change the investment game. To grapple with sustainability and intergenerational fairness and, as a consequence, seriously change our stewardship efforts. Quality foundations for this thinking are being laid by the likes of Johan Rockström, Kate Raworth, and the Future-Fit foundation to name three highlighting the importance of planetary boundary conditions. It is now up to us to build on these foundations and work out if we need to change our portfolios, or how we steward our assets.

[41] There is a third important, but more technical, point. With intergenerational fairness there is no external arbiter of the fairness – you can't take the previous generation to court. Therefore the 'impartial and just treatment' required by the definition at the top of this piece has to be exercised by the current generation, over itself. In game theory terms, future generations are always under-represented at the bargaining table and therefore always disadvantaged. Your belief in the primacy of greed or altruism within human nature will affect your optimism or pessimism about the sustainability end game.

22
Beyond ESG | systems solutions for sustainability

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This piece borrows its title from the lecture series the Institute hosted with Duncan Austin, an independent sustainability expert. We invited Duncan to present these lectures to Institute members because his message is important and needs to be heard, despite it being provocative and somewhat controversial now. We believe that it won't remain controversial for too long, certainly within the sustainability fraternity, and we are in agreement about the systemic nature of the problem.

My biggest learning from the series is summed up in the phrase: "sustainability is a property of the whole, not the individual parts". This is both simple and serious. Simple because we are seemingly not responsible for ensuring the sustainability of the system. Serious because it is so counter-cultural in a largely individualistic society where what matters most is my sustainability and that I am more important than the system.

It also provided exquisite clarity. The system is queen, and the soldiers and workers should enjoy their basic lives, playing their part in service to the queen. It is also serious because, as a part, we may need to be sacrificed for the greater good. In my view, this is consistent with all continuing systems, where it seems some components thereof must perish.

I found the series somewhat disconcerting when descending to unlearn what I thought was true, and rising again with new learning in an unfamiliar place. Now I am not sure how to get my body to join my mind in that new place. We learnt that ESG is like quick sand; the harder we try, the worse we make it. And that 'externality-denying capitalism[42] is a double bind; its logic requires fixes that are profitable (win-wins). To escape the bind, we need to act illogically and wait for logic to reform in our favour (lose-to-win). This is akin to the well-trodden path of social activism, where people like Wilberforce, Ghandi, Parks and, most recently, the 'Colston 4' acted outside the prevailing logic, and often outside the law, until history and/or the law decided they were actually on the right side.

This is deeply problematic, of course, and a good proportion of the discussion time was devoted to principal-agent issues, the constraints of fiduciary duty and free riding – all of which conspire against solving our sustainability-collective-action problem. We covered collaboration, building coalitions, and lobbying to make lobbying illegal. It would be so, so much easier if the public sector just set out clearly what was allowed and what was not. But the well-trodden path of social activism shows us this is not how things tend to work. We act, and they make our actions acceptable (sometimes, legal) after the fact.

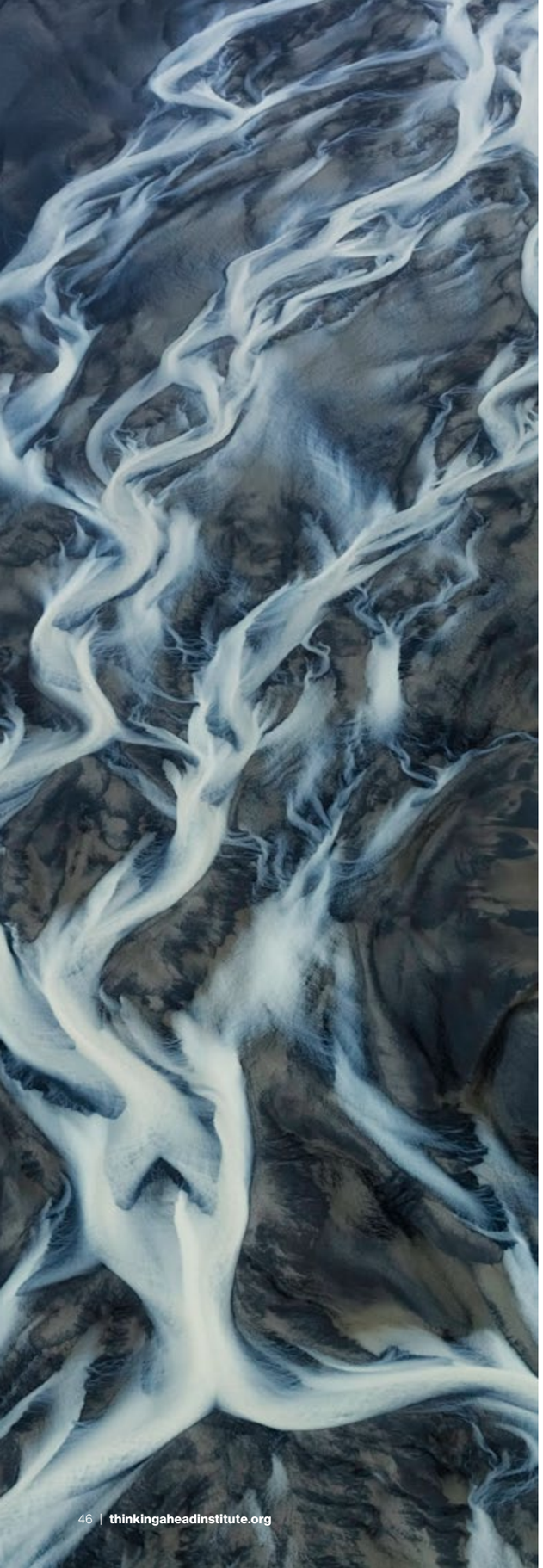
The somewhat conservative pensions/investment industry doesn't feel the natural place to start a revolution using the logic of tomorrow. And yet, the third pillar of the Paris Agreement is finance. It is a truism that what gets financed gets built. If a new fossil fuel well is financed today, we should expect that financing to be responsible for carbon emissions for three or more decades into the future. The investment industry doesn't do a huge amount of new primary investment but we could, arguably, have more influence over corporate capital allocation decisions.

We could also adopt an attitude of 'heroic incrementalism', a phrase coined by Roger Urwin in the context of transformational change, which is rarely wholly successful. My interpretation of this is that 'incrementalism' is taking the next safe, or comfortable, step. In contrast, 'heroic incrementalism' is being conscious of the scale of change ultimately required, as well as the sacrifices needed (be it safety or comfort), and doing what it can today with the resources it has. And tomorrow, or when energy has been replenished, it takes the next step. And then the next, because we are very unlikely to be done with only three incremental steps under our belt.

These are a few of my high-level takeaways from a series that took us deep into complex and often uncomfortable places; but it was true to the title and provided a highly thought-provoking systems view of a world post ESG. To enjoy your own journey click here for videos and slides.

[42] Duncan uses the phrase 'externality-denying capitalism' to provoke; he notes that the more accurate label would be 'resistant-to-internalisation-of-externalities-capitalism'

We are nearing the end of our exploration of systems, purpose and value creation, and the next two pieces will be our bridge to a consideration of the environment – taking with us, of course, our systems-infused mindset. The first piece argues for a new mindset concerning how we organise ourselves – we can keep the ESG label, but we must align our goals and processes with the sustainability of the system. The second argues that energy is the lifeblood of any system, and we must recognise this in order to have clear eyes and strong hearts for the net-zero challenge. >>>



23
What's in a name?

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Wrangles about ESG herald a time to step up on sustainable investing, not an excuse to give up.

ESG has enjoyed uninterrupted growth as a factor in the investment mix since its early days almost two decades ago. But this year it has been going through an identity crisis, dogged by doubts, with some commentaries suggesting that it could be in retreat. Some of these arguments are welcome as they point to the need for change as we adapt to its limitations and continue to develop. However, dismissive and often oversimplistic talk about ESG implies a misunderstanding of what it stands for at best and, at worst, risks derailing the many industry efforts towards greater sustainability. Executing on sustainability impact is a primary industry goal and ESG activities are still the best route we have for achieving it, despite its limitations.

ESG limitations

As a very broad-based concept, ESG's relevance and potential influence is likely to be forever contested. The versions described by various commentators vary widely and straddle both financial value and non-financial values and it is easy for ESG talk and thinking to be muddled and its outputs pigeonholed. It is also heavily embroiled in politicisation, witness its current place in the eye of a particularly challenging US political storm. It is also heavily engaged in regulation, with the SEC particularly active at present in promoting corporate reporting of climate risks and challenging industry overclaiming of ESG credentials.

Critics legitimately draw attention to all these issues and ESG advocates should be prepared to respond and mount a defence by thinking through these critiques, engaging to raise their game and adapting. This critical chatter has built up precisely because ESG has become so central and can no longer be ignored. Indeed, those that contest its value often do so from a concern that it will permanently divert attention, and business, from their version of the industry. So rather than criticising ESG in areas where it still has far to travel, more airtime should be given to refining its role and relevance for the coming era.

For a start, we must find a better way of labelling the conversation; position it within constructive and effective regulatory footprints; and connect it to real-world impact in which investing genuinely moves the needle on the environment and other key societal goals.

ESG RIP?

We start where others have[43], in suggesting that the term ESG may be coming to the end of its useful life. The simple concept we should foster is what does it mean to invest sustainably – achieving long-term success with inter-generational fairness built in. The three-letter moniker ESG does not represent this.

ESG of old worked on shareholder capitalism whereas investing sustainably is set to work with an increased weight on stakeholder capitalism, where fairness must be considered more widely and more inclusively alongside increased attention to the systemic risks, where these are rising especially in relation to climate change.

Investing sustainably reflects asset owners and asset managers justifying their license to operate – the social code of behaviours that governs them – and earning the trust of stakeholders by doing 'the right thing'. This contrasts with 'the right thing' from a past era, which was centred on successful investment performance. This past version looks flimsy in the future era of mutual flourishing in which financial outcomes are balanced with environmental and social outcomes, and not just a dogfight for bragging rights on performance.

Here we confront a critical crunch. Moving beyond the impact of these ESG risks on the portfolio to consider the impact of the portfolio and the assets in it on the world. ESG of old only fought climate risk, whereas sustainable investing of the future means ESG must evolve to fight climate change if it is to maintain its relevance. This is certainly true for asset owners with net-zero pledges but is also relevant for others too that have broadened their organisational purpose.

Sustainability 2.0

What is needed is a step up of sustainability commitments by investment organisations. This is not to unwind what has gone before. The integrated ESG approach, with all its imperfections, has been a positive journey and those activities will continue to provide investors with return and risk benefits. These will gather strength as regulations reinforce the reporting transparency and discipline that are critical for this type of investing to be genuinely effective.

But integrating ESG is too simple a discipline for aligning investment strategies with sustainability realities, which requires making a real-world impact directly or via investee companies, so fighting climate change not just managing climate risk. To be effective ESG should effectively funnel together sustainability, impacts and longer time horizons in a significant step forward in our existing practices.

This step forward should come from a new mind-set, model and measurement framework, consistent with the theory and principles of universal ownership[44]. The mindset shift is about seeing opportunities as if from the perspective of large asset owners whose portfolios own a slice of the world market. This involves seeing company externalities as portfolio-wide and system-wide risks and costs and seeing systemic risks as needing to be addressed because the returns required can only come from a sustainable system.

The model shift means employing the 3D investment model in which risk, return and real-world impact are integrated. In this model fiduciary duty is covered[45] as there is no diminution of the primacy of financial outcomes because sustainability impact is instrumental to those ends. How will this extra dose of impact be delivered? Largely via strategies that emphasise active ownership and industry and public policy engagement, implying a considerable shift in resourcing.

The measurement shift will be witnessed by success being judged more broadly, rather than an obsessional focus on outperforming the benchmark. So, progress in this area will be presenting a balanced scorecard of hard and soft measures, inputs and outputs, data looking backwards as well as forwards and covering both financial performance and sustainability.

Stepping up

Stepping up will require significant change and will be hard because we have to give up some of the hiding places from where we have operated. This is a big ask and will require industry leadership from those organisations which have the culture and capabilities[46] to put universal ownership theory into practice and start moving ESG into the real-world impact era. The beauty of the theory is that quite small numbers of organisations can create the trickle-down conditions for larger scale change.

At a time when all industries seem to be facing their 'Tesla moment', reimagining ESG may turn out to be our industry's defining moment that mobilises us to do our best work ever.

[43] *How ESG investing came to a reckoning, FT Big Read,* June 6, 2022

[44] *Pension Funds as Universal Owners: Opportunity Beckons and Leadership Calls,* Roger Urwin, Rotman International Journal of Pension Management, May 3 2011
[45] *A legal framework for impact,* Freshfields Bruckhaus Deringer, 2021
[46] *The 3D investment framework is a game-changer for all of us,* Top1000funds.com, 2021

24 Energy is the fundamental systemic risk

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This thought piece makes the case that energy is the metaphorical lifeblood of any system, and is, therefore, the fundamental systemic risk. This insight should inform how we go about our net-zero investing.

As my entry point, let me ask and answer a question: what is energy for? Let me remove humans from the frame momentarily. This leaves us free to observe that energy comes from the sun; that plants convert the sun's energy via photosynthesis into sugars; that some animals eat the plants; and that other animals eat animals. It follows that the plants need to replace what has been eaten. If there is any energy left over, the plant can think about growth – either making itself bigger, or by making copies of itself. From this, we can see that energy has two uses – maintenance, or the repair of damage, and growth, or the making of new things.

When something is new there is very little maintenance to do, allowing almost all the energy to be expended on growth. If it is also small, the rate of growth can be spectacular (low-base effect). Over time, parts wear out and need to be replaced so, a larger and larger proportion of energy is spent on maintenance, and less is available for growth. In addition, the "thing" is now bigger and so the rate of growth falls and eventually stops. Biological growth for an individual entity has a stopping rule; when all the incoming energy is required for maintenance, growth stops.

As we have removed humans for the time being, the "thing" above will be biological, but the principles also transfer to mechanical things. It takes energy to create a machine and more energy to maintain it.

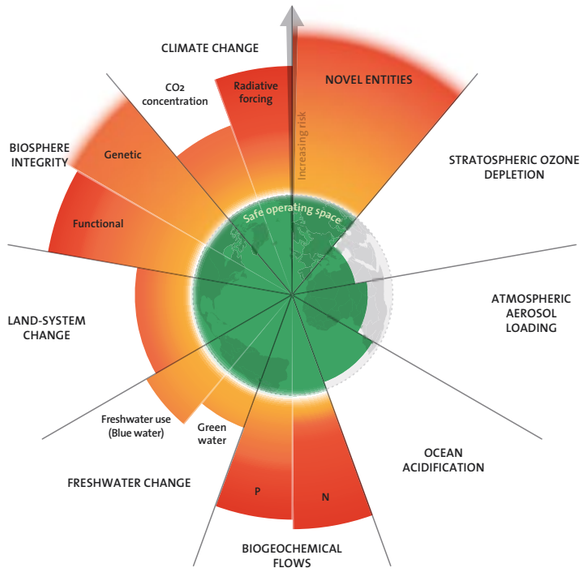
Returning to our human-free world, we can now start to think about systemic risk. Our thing will seek to replicate itself and grow its population. In isolation, a population can grow up to the limits of available energy. So the population of a bacterium in a petri dish will grow exponentially and then crash to zero when the food runs out. The population of rabbits on an island will rise and fall as it adjusts to the availability of grass. But populations rarely exist in isolation. Instead, we typically observe multiple populations existing simultaneously in an ecosystem, which introduces the complexity of different types of relationships – from symbiotic to predator-prey. These ecosystems can evolve to an equilibrium state, which will be within the limit of available energy, and the rates of extraction and rates of replacement will be equal (a prey species will have enough offspring to replace those being eaten).

Evolving towards equilibrium does not mean systemic risk is absent – just ask the dinosaurs. Even excluding external shocks posed by meteors, a new species could arrive over the hill and find that it is perfectly suited to this new environment. At best, the existing species will have to concede some ground to accommodate the new arrival. At worst, the newcomer outcompetes one of the existing components and sets off a cascade of consequences. Or, perhaps, the climate changes with a similar wide range of possible effects.

We can now re-introduce humans and let them do their thing. They build societies and economies (the 'system') some of which, over time, collapse. This thought piece would suggest that the collapsed historical systems out-grew their ability to maintain themselves.

One more thought before we get to our present context. When systems grow, they also increase in complexity. As the number of components grows, the number of possible connections between them explodes. Niches tend to get smaller, and specialisms deeper. There is now a need for energy to also support significant information processing. As we have discussed above, the availability of energy is a systemic risk. I see it as the fundamental systemic risk. And we increase that risk every time we grow our system. I suggest a hypothesis: human systems will always be associated with rising systemic risk. We apply our ingenuity to overcome system constraints. This leads some to believe that human ingenuity will always be able to overcome the next presenting problem. The other side of that trade is that, if we fail on any one occasion, then systemic risk may not show much mercy.

Our present context is illustrated by the graphic. It was created by Johan Rockström as part of his seminal work on planetary boundaries. This version contains 2022 data. The planetary boundaries are indicated by the dotted line. The colour green signifies activity within the boundary. The colour orange highlights activity beyond the boundary. The way we are running our system is – according to the scientists – literally unsustainable.



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Climate change has captured the majority of the public attention, and emissions are in breach of their planetary boundary (and so our climate is warming and will continue to do so under present conditions). But the biodiversity problem is even worse – the label 'E/MSY' (extinctions per million-species-years) shows it so much further beyond its planetary boundary. We should expect most ecosystems to change.

The chart also shows that we have big problems with plastics ('novel entities') and how we produce our food ('land-system change' and 'biogeochemical flows'). If you believe the scientists have done good work and placed the boundaries in the correct places, then it is hard to think of any better visualisation for systemic risk. We are running our system too aggressively.

So, how might our current context of systemic risk and breached planetary boundaries play out? There are broadly two pathways – to deliberately manage the risk down through time, or to continue as we are and expect the system to reduce the risk in its own way at some stage through a collapse.

Hopefully the first option is obviously preferrable, but the difficulties of bringing it about are equally obvious. Global governance, and stronger national governance, would help. However, the landing place I am aiming for is net-zero investing. If it is true that a system will always try to grow unless constrained, then it follows that it will lap up any energy that is available, irrespective of its carbon content. This means that trying to reduce fossil fuel energy will be pushing against the 'natural order of things'. It further means that addressing systemic risk, and the breached planetary boundaries, will require the deliberate imposition of constraints – in order to change the shape of the system, and how (or whether) it can grow. It is my belief that net-zero investing will need to incorporate this idea of constraints, so that it can succeed with the net-zero part of its mission.

Our first pass through the environment hub will follow the course of net-zero, arguably the biggest change of objective for the economy, let alone the investment world. This consideration will take us through the society hub and briefly back to governance, before we return to environment and unpack the climate problem in greater depth. But first, and with regret for the inadequate treatment, a single piece on the risk posed by biodiversity loss. >>>

25
Why should the investment industry care about biodiversity loss?

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Biodiversity loss is consistently highlighted as one of the top global risks in terms of its impact and likelihood in the next 10 years[47]. Yet the issue is still not widely understood or managed, it has been overshadowed by climate change and it often does not get the headlines it deserves[48].

Human activity towards economic growth has taken its toll on biodiversity – according to the New Nature Economy Report by the World Economic Forum[49]: a third of the world's topsoil has been degraded, 32% of the world's forest area has been destroyed, at least 55% of ocean area is covered by industrial fishing and there is a rapid decline in the population of mammals, birds, fish, insects, reptiles and amphibians. Four out of nine planetary boundaries[50] used to define a "safe operating space for humanity" have been exceeded.

To maintain our current living standards and growth rates, one Earth is not enough. The Dasgupta review found that between 1992 and 2014 produced capital per person doubled, and human capital per person increased by about 13% globally, but the stock of natural capital per person declined by nearly 40%[51]. This trend suggests that the way markets have been operating up to now is not sustainable in the long term. The true value of goods and services nature provides is not reflected in market prices creating pricing distortions and leading to underinvestment in natural assets.

The biosphere is the foundation of economies and societies and the basis of all Sustainable Development Goals (SDGs). Nature loss threatens financial stability and poses a systemic[52] and non-linear[53] risk which is likely to impact financial returns in the future and increase volatility. Economic growth at the expense of the environment and the biosphere is unsustainable in the long term.

The Taskforce on Nature-related Financial Disclosures (TNFD) also introduces risks and opportunities for the financial sector. This likely incoming biodiversity regulation has possible reporting implications and aims to enable financial institutions to integrate nature into decision-making.

Addressing biodiversity remains a major challenge for the investment industry. Investment organisations already have limited governance budgets which are taken up by climate change, there is a lack of data and regulation and it's difficult to measure the impact. However, biodiversity risk is rising in investment conscience. Reputational risk and social licence to operate considerations are growing over time. The investment industry has an opportunity for impact through stewardship, lobbying and looking for solutions to target climate change in conjunction with biodiversity through nature-based solutions, such as regenerative agriculture and land use and deforestation solutions. This requires innovative thinking, and addressing both creates co-benefits which are captured in the 17 SDGs. It also makes sense, as according to the UN CCD report "Global Land Outlook 2", nature can provide more than one-third of the cost-effective climate mitigation needed to limit global warming to 1.5°C[54].

We, as humans, and our economies are embedded in nature – we are part of the ecosystem and depend on it significantly. We can look at nature as having intrinsic value to us, irrespective of its ability to provide a monetary return, or instrumental value, where it is preserved for monetary gain and extraction of services. The intergenerational effect of biodiversity loss makes this issue complex. Looking at biodiversity as a multigenerational problem makes it difficult to approach it solely through an instrumental lens – biodiversity's value is not just the value we derive from it and isn't something that can be measured in monetary terms. We therefore should be accounting for the value that future generations will want to derive from it too.

In the investment industry, we often find ourselves entering into a transactional relationship with nature and it is important we find the middle ground between both intrinsic and instrumental values. We need to find a way where what economic models dictate and what we might really desire for ourselves and our children is aligned.

[47] *Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy,* World Economic Forum, January 2020
[48] *Our House Is Burning: Discrepancy in Climate Change vs. Biodiversity Coverage in the Media as Compared to Scientific Literature,* Frontiers, January 2018
[49] *Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy,* World Economic Forum, January 2020
[50] *Planetary boundaries,* Stockholm Resilience Centre
[51] *Final Report - The Economics of Biodiversity: The Dasgupta Review,* HM Treasury, August 2021
[52] *Central banking and supervision in the biosphere: An agenda for action on biodiversity loss, financial risk and system stability,* NGFS-INSPIRE Study Group, March 2022
[53] *Non-linear changes in modelled terrestrial ecosystems subjected to perturbations,* Scientific Reports, August 2020
[54] *Global Land Outlook,* UNCCD, 2022

26
The net-zero challenge

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Asset owners looking for a heroic challenge need look no further than managing climate risk and playing a meaningful part in the net zero energy transition.

There are three difficult beliefs in play on this. The first is accepting the strong scientific evidence pointing to potentially catastrophic risks and impacts if climate change continues on its current trajectory and that, without substantial collective action, society risks irreversibly damaging the natural and financial systems that sustain us. It's hard to overstate the seriousness of this situation.

The second belief is that the nature of these risks is fundamentally different from the risks we have traditionally focused on in the investment world, in that they are systemic, undiversifiable, highly uncertain and impossible to hedge. These uniquely difficult risks make collective action vital and necessary through the nation state commitments that are required to cascade down to all institutions to implement a just transition to a net zero economy.

In a world looking for stronger leadership and for an investment industry striving for greater purpose, the net zero framework is an appropriately purposeful and substantive change. Those asset owners that have made, or will be making, net zero commitments are probably *doing the right thing,* but there should be respect for every fund's unique circumstances to reflect on this differently.

The third belief involves asset owners adding a net zero-trajectory objective to run alongside and complement the central financial objective of maximising risk-adjusted returns on investments. The belief is premised on financial outcomes from net zero investing being better in the long term, precisely because of the climate outcomes. While managing them together is a powerful proposition, it does imply a big modification of the current investment model. Not least because aligning two objectives at the same time can involve compromises or concessions. Here *doing the right thing* does not always make it possible to *do things right.*

For example, imagine in 2025 that net zero-pathway companies make up only half the market. Does an asset owner pick from that half while recognising the material investment constraint and knowing also that the net zero tailwind may now be a headwind. In other words, that these assets may be priced at a premium offering reduced forward-looking returns relative to others. So, doing the right thing may now mean struggling to do things right when trying to deliver both the highest risk-adjusted returns and alignment to net zero.

Challenges

It should be very clear that there are a number of large challenges confronting asset owners when implementing net zero policies including these additional tasks adding to the already stretched asset owner governance budgets:

a) Identify and execute appropriate net zero investment policies

b) Measure and report on the carbon journey through a plan

c) Maintain strong governance with robust continuity

d) Align with all regulatory requirements on climate

e) Manage the reputational risks arising from the public scrutiny of net zero journeys.

But we should also recognise that there are investment and reputational risks from not committing to net zero.

The net zero deliberations must weigh many uncertainties and complexities that make current decisions extremely hard to reach. In normal circumstances, the decision might more reasonably be taken when certain facts (investment, legal, political and science) have become clearer, but the current political agenda is pressing for an immediate decision.

There may be a silver lining to this cloud in that the trickle of early net zero movers will trigger market interventions that may create disproportionate benefits. As the trickle turns into a cascade, more asset owners will move faster down de-carbonisation pathways and their actions will reduce the worry of failing unconventionally in isolation. This solidarity, across asset owners, in which shared interests and mutual dependence develop is the collective action we need and a case of the ends justifying means.

Road map

Having understood the challenges associated with a net zero pledge and given serious thought to the beliefs and analysis required, what road map is required for this journey?

Let's start with the objectives. Asset owners will need exact and multiple goals that are clearly drafted alongside the beliefs that support why those goals were chosen and how these goals will align with stakeholder expectations and fiduciary duty.

Then there is the carbon journey plan. There are the short-, medium- and long-term segments, in which the different sources of decarbonisation add up to the required trajectory.

Then there is the strategy. The chosen climate strategies should be categorised and described – both allocation and engagement; both decarbonisation and climate solutions. And the collaborations and delegations in the road map should be outlined with the necessary resourcing.

One point of emphasis is that the increased public disclosures of such investment plans and policies make much wider scrutiny inevitable. This reinforces the need for particularly clear beliefs and principles given that the justification of investment policies by reference to past performance in climate risk scenarios is not possible.

This road map must allow for much to change and so needs to be adaptive; which is easier done when constructed with maximum transparency, authenticity and competency. This is a big test of technical proficiency and cultural mettle.

We note how large funds play a special part in the net zero transition under universal ownership[55] principles .Their capacity to play a proportionately larger part in addressing climate change comes from applying their weight alongside others in alliances that recognise their dependency on market beta combined with the leverage of collective action to build better beta.

These asset owners can currently enter net zero commitments with solid financial arguments and use a supporting tailwind; but they no doubt will have to deal with tougher battles at various moments in the future. Under current fiduciary duty any concessions must fall on the climate ambition, not the risk-adjusted return but there may be a window of opportunity for them to lead change on this emphasis.

Fiduciary duty

This brings me to a personal view that fiduciary duty should be adjusted to provide better guardrails within which asset owners can operate. It seems that fiduciary duty, with its current high bar in financial primacy and poor air-cover for trustees, is fast becoming an anachronism in a world now focused on sustainability and wider responsibility.

Fiduciary duty varies by jurisdiction but using the UK's fairly typical pension system as an example, there appears to be a fundamental disconnect between the government's legal net zero obligations and asset owners' ability to help fulfil these. In order to be fit-for-purpose fiduciary duty certainly needs to be better balanced and probably requires a statutory override that accommodates net zero commitments. This form of *guardrail* could help asset owners avoid the prisoners' dilemma, of acting singly and selfishly, and instead act collectively and with solidarity as a better path for all. This reinforces how we need more public and regulatory interventions across the value chain, be it regulations, policies, tariffs or public funding, to support the journey of private finance and the whole ecosystem in the net zero direction.

It seems that only through collective action, and doing what we can with what we've got, that the investment industry can step up and avoid potentially irreversible damage occurring to our most important systems. Regulators will have a say in how influential asset owners become but whatever comes asset owners will play a substantial part. Out of great power comes great responsibility.

We jump paths briefly to consider whether the investment industry should worry about net zero – is this a problem that the industry owns, or is it someone else's problem? The first piece argues that investment does own a slice of the problem, and the second proposes that the response should be a lot more primary investment. We will then check in to see how we are getting along with net zero. >>>

[55] Universal ownership combines the large-fund mindset of seeing themselves as long-term owners of a slice of everything – the world economy and market and its implied dependency on the market beta; with the large-fund strategy of leveraging collective action to build better beta to address systemic risk through active ownership, systemic engagement and allocations to more sustainable betas. 'For universal owners, overall economic performance will influence the future value of their portfolios more than the performance of individual companies or sectors'. (Urwin | Universal Owners | Rotman Journal of Pensions Management 2011)

27
How much of the climate problem does the investment industry own?

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In this note I will document how I came to the conclusion that the investment industry 'owns' approximately 25% of annual global greenhouse gas emissions. This feels like a necessary first step towards addressing the climate problem. However, it is not a given that ownership of a problem naturally leads to the owner solving the problem. We will briefly refer to this in closing.

As a passing comment, I was surprised at how hard it was to make sense of an apparent abundance of data on emissions. Some datasets favour carbon dioxide (CO_2) emissions, others greenhouse gas (GHG) emissions; each dataset appears to define sectors differently. As a consequence, I developed a rule of thumb (CO_2 is 70-75% of total GHG) and developed my own, high-level, sectors to suit the current thought experiment.

Finding total emissions data on the internet is straightforward, but the data comes with a lag. It takes a little more reading around to find estimates of current emissions rates. For our purposes, we do not need a high level of accuracy so we will state that current CO_2 emissions are slightly below 40bn tonnes per annum[56], and GHG emissions around 52bn tonnes[57 58].

Finding the investment industry's 'ownership' of emissions requires a bit more work, and some assumptions – which can clearly be challenged. Arguably, a more accurate way to quantify the investment industry's emissions would be bottom-up – aggregating all the emissions from all the assets owned. However, there are substantial data challenges with this approach, including the problem of cross ownership of shares. I am not looking for high accuracy at this stage, and am willing to tolerate some rough justice implied by simplifying assumptions. Consequently, I assume:

1. The investment industry owns the entirety of all listed companies (they actually own a large subset, so at this stage we are overcounting)
2. Corporate bonds are only issued by listed companies (this assumption allows us to ignore corporate bonds; we do not know in which direction the inaccuracy of this assumption would affect the results)
3. Lending money to sovereigns (buying their bonds) does not make the investment industry responsible for public sector emissions
4. Allocations to real estate and private equity are relatively small and therefore the emissions can be 'covered' by the overcounting within assumption #1.

In short, this list of assumptions allows us to proxy the investment industry's emissions by simply considering a global equity index, for which aggregate data exists. If we consider the MSCI All Country World Index, then current GHG emissions (scope 1 and 2) are currently 6.4bn tonnes. I make one final, heroic, assumption that the scope 3 emissions (largely attributable to the use of sold products) are the same size as the scope 1 and 2 emissions. From informal conversations with industry peers it appears that the range of estimates for the size of scope 3 emissions is wide, from the lowest being around 50% of scope 1 and 2 to the highest being in excess of 100%. I have assumed something at the upper end of the range. It follows that public investor-owned companies produce around 12.8bn tonnes of annual GHG emissions and are therefore responsible for 25% of all emissions (12.8/ 52 = 24.6%).

Relying on assumptions is more comfortable the more confident we can be that they are reasonable. To this end, I looked for evidence to corroborate this result – and I (re)discovered a CDP report from 2017[59]. Using data for 2015, CDP attributed 30.6bn tonnes of GHG emissions to 224 fossil fuel extraction companies ("operational and product GHG emissions" from page 10 of their report). This is approximately 60% of total emissions (30/50). In essence they have attributed back emissions from all other sectors (ie scope 3 activity). This is very pragmatic in terms of simplifying the number of companies to engage with, but is it reasonable?

We will check the reasonableness two ways. First, we will see if we can get close to the 25% number derived from the MSCI ACW Index, and second, we will see if we can satisfactorily explain the 'missing' 40% of emissions.

Helpfully, CDP provide further information. They state that of the 30.6bn tonnes, 30% come from public investor-owned companies, 11% from private investor-owned companies and 59% from state-owned companies. [Note, this is 2015 data so pre-Saudi Aramco's IPO which would shift the proportions slightly]. For now we will assume all of the 11% private sector is attributable to institutional investors, but this is likely an overstatement. It follows that the investment industry is "directly" responsible for about 25% of annual emissions [(30% + 11%) of 60%]. Tada, as some might be tempted to say.

For the second test I must continue with a relaxed attitude to accuracy as I will need to cast around and combine other data sources. The results of my research are shown in the table below.

Owner	Allocation	Source
Investment industry	**25%**	CDP Carbon Majors Report 2017
State-owned fossil fuel companies	**35%**	CDP Carbon Majors Report 2017
Agriculture	**15-25%**	Food Climate Research Network Post-farm food system is a further 5-10% but a proportion of this is likely accounted for in top 2 rows
Wildfires	**5-10%**	Inside climate news Figure for 20 years to 2017; new records for wildfires have been set over the last couple of years
Other	**5%+**	A catch-all covering waste, deforestation, melting permafrost and other activities

For my part, I am satisfied that the missing 40% of emissions is sufficiently explainable and I think the CDP approach is very reasonable. It also throws a new light on the problem, which then suggests new solutions (see following piece).

Does owning a problem lead to solving the problem?

My purpose in this note was to attribute a proportion of the climate problem to the investment industry. I am satisfied that 25% is a reasonable attribution. What the investment industry does with this conclusion is far from certain. A number of considerations apply here:

- What capacity do industry organisations have to contribute to a solution? (ability)
- What should be the extent of the contribution – minimum, fair share, generous? (extent)
- Do industry organisations have a moral incentive to contribute? (intrinsic motivation)
- Is the solution likely to be profitable, reducing fiduciary duty concerns? (extrinsic motivation)

The question I would like to pick up here is the extent of contribution. Is the minimum contribution to do nothing, and leave the problem for governments and investee companies to sort? Is the investment industry's fair share solving 25% of the problem? Or, given that wildfires and melting permafrost are not going to amend their ways and provide their fair share of the solution, is it a higher number? And is being generous even possible when bound by the requirements of fiduciary duty?

All of these questions imply autonomy, but that is not a given. The inevitable policy response could introduce compulsion, and if that is combined with cynicism regarding the realism of required actions we could find ourselves in a pretty toxic industry culture. Better, in my opinion, to get out ahead and start on some meaningful actions while they remain voluntary. The Institute and its working groups will continue to grapple with difficult issues such as these.

[56] *ourworldindata.org* states that 2018 CO_2 emissions were 36.58bn tonnes
[57] *ourworldindata.org* carries an article quoting 52.3 bn tonnes, which we think relates to 2017 (as the source that is quoted is in a 2018 paper). The expectation for 2020 from exponentialroadmap.org is 54.2bn tonnes (version 1.5 updated March 2020.)
[58] We follow standard convention for these measurements in that GHG emissions are measured in tonnes of 'CO_2e' which is shorthand for carbon dioxide equivalent
[59] *The Carbon Majors Database: CDP Carbon Majors Report 2017*, CDP, 2017

28
The answer is more primary investment; a lot more

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Having provided the answer in the title, it is only polite to also provide the question: what should the investment industry do, assuming it is serious about addressing climate change? This note documents the thinking required to navigate from the question to the answer.

Some brief context

I always enjoy being part of a TAI working group for a number of reasons ranging from conviviality to genuine surprise as the work product emerges as greater than the sum of its constituent parts. This year is no different and I am part of two great groups grappling with different aspects of climate change. However, and this is confession time, I have been struck by the complexity of the subject, and by how hard it is to make progress. We are definitely climbing the ladder rung by rung – but is our ladder leaning against the right wall?

That heretical thought prompted two questions:

a) how much of the climate problem does the investment industry own?

If it turns out that 99% of emissions come from state-owned coal companies, wildfires and melting permafrost, does it really matter if the investment industry completely decarbonises it's 1%? By my estimation the investment industry owns 25% of the climate problem (see previous piece). Meaningful enough to proceed to question #2

b) how do we cut through the complexity to find the 'one thing' the industry should focus on? Or, to continue the above analogy, how do we make sure our ladder is leaning against the correct wall? This is the question I address in this note.

The simplifying assumption

The way to cut through all the complexity of scopes 1, 2 and 3 and the ensuing double counting is found in a CDP report[60]. In that report CDP attributed 30bn tonnes of (2015) carbon emissions to 224 fossil fuel extraction companies – genius. The logic here is that if fossil fuels were not extracted from the ground, they would not be burned and emissions from this source would be zero.
We can therefore simplify the emissions problem as comprising only the scope 1 and scope 3 ('use of product') emissions of the fossil fuel extractors. In other words, emissions from (most) other commercial activity fall within scope 3 of these fossil fuel companies.

I am effectively assuming that energy is fungible – we can painlessly and costlessly switch between carbon-based energy and zero-carbon energy. This is patently not true, particularly in the cases of aviation and shipping. It also ignores other sources of demand for oil in particular, such as the chemicals industry. We will not be able, therefore, to limit our intervention to a small number of fossil fuel companies. In some cases we will need to take the next step down the supply chain.

Despite the fact that this assumption is obviously flawed, it yields a very powerful insight. It's all about the cleanness of the energy supply that the economic machine runs on. This in turn leads us to conclude that 'the answer' (the interim answer, in our case) is zero-carbon energy.

Zero-carbon energy | the $110trn transition problem

The International Renewable Energy Agency (IRENA) estimates that the cumulative investment required between 2016 and 2050 to transform the global energy system to meet the objective of the Paris agreement is $110trn[61]. This is a very big number – approximately the same size as the total assets currently stewarded by the investment industry. And, for the avoidance of doubt, this is the 'lot more' new, primary investment we are taking about.

The path to zero-carbon energy

To define the path of decarbonisation we must consider two further questions. First, how close to zero are we aiming?

To answer this question let's define a spectrum. At one end, net-zero emissions are achieved by reducing absolute emissions to zero. We label this the 'low-carbon risk, high-transition risk' (LCHT) path. At the other end, absolute emissions could, theoretically, grow as achieving net-zero is driven by scaling-up negative emissions technologies (NETs). We label this the 'high-carbon risk, low-transition risk' (HCLT) path. It is clear, then, that the choice of how low to drive absolute emissions will be driven by a belief concerning where on the spectrum we should aim[62]. It is worth stressing that this is a belief – the consequences of running either high-carbon risk or high-transition risk are unknowable at this point in time.

It is worth stressing that the choice of position on the spectrum does not change the requirement for a massive amount of new primary investment. At the LCHT end the investment is into renewable energy capacity; at the HCLT end the investment is into NETs.

The second question is what 'shape' of decarbonisation path do we prefer? (We can worry about practicality later.) The Institute's 1.5C investing working group have already adopted an exponential shape (-7%pa) as a foundation, but the path could take a close-to-infinite number of forms. The key point we make here is the difference between front-end loading, where the big carbon reductions are done early (as with the exponential) and back-end loading, where the big carbon reductions are left until the end of the target period. This is another angle on the carbon risk issue. Back-end loading the reductions is choosing to run higher carbon risk and would be a characteristic of any path relying heavily on NETs which will require time to be scaled up.

An aside on carbon- versus transition-risk beliefs

According to my beliefs, carbon risk and transition risk are very different, and therefore should receive different consideration.

Whether you subscribe to Joseph Schumpeter's idea of creative destruction, or to the Santa Fe Institute's conception of the economy as a complex adaptive system, the global economy is always in transition. Sometimes the transition is smooth and gradual, at others it is abrupt. So, as we transition from a carbon-based economy to a zero-carbon economy new jobs will be created. We just don't know whether they will be more or less numerous, or better or worse than the jobs that get destroyed. In any event we should expect some individuals to be adversely affected, perhaps severely so. It is only humane, therefore, to minimise and carefully manage the transition risk.

Carbon risk is different in that the economy (and humans for that matter) hasn't had to deal with this concentration of carbon in the atmosphere before. Not only is the carbon problem novel, it is also non-linear. The physical consequences of the next 0.1C rise in temperature are more severe than the previous 0.1C increment. And, most significantly of all, at some unknown level of temperature rise humans, and most other life forms, will face existential risk. In my beliefs, an existential tail risk like carbon should carry a far higher weight in any decision than a 'mainstream' risk like transition. This pushes me towards the LCHT end of the spectrum. To be clear this is about prioritisation, not either/or. I believe the top priority is rapidly to reduce absolute emissions, but I also believe we are at a stage where 'all of the above' is the correct answer[63]. We need to invest heavily, and rapidly.

[60] *The Carbon Majors Database: CDP Carbon Majors Report 2017*, CDP, 2017
[61] See the IRENA.org website: *summary page here*, *2019 report page here*

[62] This spectrum is analogous to the four illustrative model pathways within the IPCC special report on 1.5C. LCHT corresponds to the IPCC's P1 path, and HCLT to P4 *https://www.ipcc.ch/sr15/*
[63] For example, the IRENA report referred to above suggest four large, necessary categories of investment within the $110trn total: $27trn in renewables, $26trn in electrification, $37trn in energy efficiency and even $20trn of new investment in fossil fuels (and others)- presumably in the near term only

The investment industry and (net-)zero-carbon energy

It is now time to consider the investment industry. To play its part in achieving (net-)zero-carbon energy it is clear that two actions are required:

a) Manage the existing investor-owned fossil fuel companies to net-zero emissions

b) Decide what to do about the new primary investment thing.

Managing existing fossil fuel companies to net-zero emissions

The first action throws up an immediate problem. An investor's incentive to preserve capital value is in opposition to the goal of running down their fossil fuel companies' carbon business. This means the natural incentive must be over-ridden by either (i) a risk narrative, or (ii) a pro-social (impact) narrative, or (iii) a combination of the two. A suitable risk narrative would explain possible threats to capital value, such as write downs (permanent reduction in demand for fossil fuel products; stranding of reserves), or future litigation. Hopefully it is obvious that this framing is dripping with issues, but as they lie outside our current argument I will leave them for future treatment. For now my focus is on new primary investment.

The new primary investment thing

The simple truth is that the current industry infrastructure is set up to manage portfolios of securities. New primary investment is a tiny part of current activity. Outside a handful of Canadian funds and a similar number of the largest sovereign wealth funds who have the internal teams to pursue genuine primary investment, most investors are not doing any[64].

We need some sense of scale for this discussion. Assuming the IRENA figure of $110trn is correct, and that the investment industry owns 25% of the problem, investment's share of the cumulative total over the next 30 years is $27.5trn. If you will allow me a little rounding, this is new primary investment of $1trn per year. For a size comparison, it is estimated that private equity has $1trn in 'dry powder' ie cash waiting to be invested.

The comparison with private equity dry powder raises the question of supply of capital versus the demand for capital. The presence of dry powder could be taken to mean that there is a greater supply of capital, looking to be invested, than there is demand for it – or, alternatively, there is a shortage of institutional-grade innovations to fund. I think a more nuanced explanation is warranted – involving normal speed of drawdown, and general partners having fairly high return targets – but the main point remains valid. The bulk of private equity investments, by value, are mainly buyouts rather than the funding of new ideas (such as venture capital). In other words, it is hard to invest large amounts in new ideas. Technologies can take decades to mature until they are capable of being scaled significantly. This is the main reason why the carbon reduction benefits of NETs would necessarily be back-end loaded. Thankfully there appear to be some seasoned technologies which could be scaled – solar and wind electricity generation! However, as a regulated utility business, these investments would not offer high-enough prospective rates of return for those with high return hurdles.

Can't we deploy this capital through the secondary markets?

If the bulk of the investment industry's expertise lies in the secondary markets, why not deploy the required capital that way? This would be a pragmatic option, but equally problematic. This route would outsource the capital allocation to listed company managements. On the one hand this is very sensible as company managements do primary investment as part of their day job. On the other hand we need to worry about (i) size and (ii) incentives.

With respect to size, there are two aspects. First, we should expect the larger listed companies to do more primary investment than the smaller ones, and hence the investment will be biased towards what already-large companies think is required. Second, will listed companies invest enough? Hold that thought for a moment.

The incentives point overlaps with size (large, leading companies find it hard to cannibalise their own revenue even if that is necessary to survive and thrive long-term[65]) but is wider. The classic formulation would be to investigate whether the executive pay arrangements promote large-scale uncertain capital projects.

Returning to the thought we held, BP offers an interesting case study. While its market capitalisation has fallen, it remains a large company. In September 2020 it announced its strategy review, part of which was a commitment to invest $5bn in low carbon energy each year. How should we assess this commitment? It is 0.5% of the hypothetical $1trn annual need we derived above. Maybe that is OK for a single company. But the $5bn is perhaps around 33% of the new capital BP intends to invest in its existing carbon business[66]. Maybe that is less OK. Is it to do with the internal incentives?

The final point to make is that if the primary investment is done from cashflow, it is unlikely to be big enough. Investing at scale via this route will still involve handing over large amounts of cash for newly issued securities.

Didn't we get burned by the last clean tech bubble?

Irrational exuberance and bubbles are an occupational hazard for investors and it is always possible to provide capital at the wrong price. This note simply lays out a flow of logic – if we want to solve the climate problem we need to reduce emissions to net zero; this requires us to replace carbon energy with clean energy; this requires a level of new investment, for a length of time that none of us have experienced in our careers. There will be plenty of opportunities to invest in more speculative NETs, but there is also an enormous opportunity for lower-risk, lower-return investment in renewable energy infrastructure. My belief is that the demand for clean energy will not disappear. It will therefore be about the entry price.

It seems clear, to me at least, that we need to massively scale the investment industry's ability to deploy primary capital. This will be non-trivial to say the least. What does this say about quantum and quality of skills required in industry? And where will those people reside – within mainstream asset managers, boutiques, or within large asset owners?

Conclusions

This piece set out to identify the 'one thing' the investment industry should focus on, to play its part in addressing the climate crisis. The answer is new primary investment. My beliefs lead me to favour investment in renewable energy; other beliefs would favour NETs. In truth we will need both – and we will also need to invest in energy efficiency, electrification and infrastructure. But we must keep the most important thing: we should start with the fossil fuel companies, and the need to get net-emissions to zero as fast as possible.

This piece has assumed the investment industry wants to play its part. That is not a given. I alluded to problematic incentives. We must also act in accordance with fiduciary duty, respecting the primacy of financial returns. Consequently, acting in line with the thinking expressed in this note would require a careful and complete narrative that explained to all stakeholders how the proposed course of action is compatible with strong financial returns through time. That said, I would also argue that not acting should also require a careful and complete narrative as to how the portfolio will avoid the inevitable disruptions caused by climate change.

[64] Even if they have a private equity program the majority of this will be dedicated to changing ownership (eg buyouts) rather than primary investment (eg venture capital)
[65] The theme of before The innovator's dilemma by Clayton Christensen to 2025"
[66] *From International Oil Company to Integrated Energy Company: bp sets out strategy for decade of delivery towards net zero ambition,* bp, August 2, 2020
"Within 10 years, bp aims to have increased its annual low carbon investment 10-fold to around $5 billion a year " and "bp intends to maintain annual capital expenditure — including inorganic investment — in a range of $14-16 billion to 2025"

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A net-zero check-in – how are we doing?

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A net-zero check-in – how are we doing?

The net-zero investing journey passed a milestone this May (2023), having already ticked one third of the way towards 2030 goals and one twelfth of the way to 2050 goals. So it's a good time to enquire how investors and the real economy are really doing.

Asset owner net-zero progress

On the plus side of the ledger the asset owners, and the asset managers, have come a long way in their net-zero mindsets and skillsets. Net-zero ambition involves writing a completely new investment chapter. And the response of the industry has been to mobilise a lot of new thinking in a short space of time to do so. The amount of effort and innovation applied has been exceptional.

We are seeing the fruits of this in the industry's deeper understanding of scenarios and alternative pathways with the TCFD process an important catalyst.

And there are credible investment strategies emerging with bigger allocations to climate solutions in combination with deeper engagement with companies, within the industry and in public policy. At the same time, there has been correspondingly and appropriately little appetite for divestment.

Inevitably there have been some setbacks, including recent performance challenges with low-carbon allocations being whip-sawed by the consequences of concerns about energy security. There are no easy answers in how to deal with these performance issues, and greenwashing temptations, which are further complicated by politics – particularly in the US. These issues illustrate the difficult balancing acts ahead for investors in staying true to their beliefs and principles.

Fiduciary duty, with its heavy presumption of financial pre-eminence, hasn't helped the net-zero challenge. Asset owners face a tough hurdle when it comes to deploying the requisite capital in climate-solution areas, where long time horizons and policy risk are front of mind and which can be roadblocks to faster change.

On the minus side of the ledger, all these new circumstances are introducing clunkiness and disjointedness into governance arrangements, which is feeling the strain under the grip of massive complexity. This has produced a pile-up problem: too much fragmented reporting and not enough joined-up action. We all notice the grind of new technical stuff, onerous regulations, the talking over each other, and the conversations not landing. The governance pathway will involve normalising and standardising our practices, as well as mastering a new language – this will all take time.

So how do we mark the card at this early, but critical point? We can only give a ballpark answer – such is the peasouper fog that we are working in. But it is reasonable to suggest we are doing as well as can be expected in the difficult circumstances and asset owners are building some muscle and savvy for the challenges ahead. But at this check-in point we are nothing like on track for the climate outcomes sought[67]. In the net-zero pathway, let's be clear, we have a lot of ground to make up.

Net-zero progress in the real economy

To still achieve the 1.5C pathway, in the real-world, we will need a dramatic reengineering of our energy system across multiple technologies and every conceivable geography. Challenges don't come bigger.

The massive reengineering required has solar and wind key to the mix; hydro, bioenergy and nuclear in the mix; coal, oil, and gas out of the mix; and carbon capture and storage, battery technology and a streamlined decarbonised grid playing a developing role.

But here's the rub. We haven't got the capacity to do all these things to the extent we need because of the frictions[68] that are holding us back and which need some fixing.

In the energy transition, it's not that much about costs holding us back. We now have renewables looking attractively priced and we can absorb somewhat the energy-transition costs arising from new capital deployment. What we can't seem to do is deploy capital at the speed needed; with less than half the rate of deployment required of solar and wind being the most obvious example.

This lack of speed is because of the frictions involved: capital allocation decisions with fiduciary duty issues; benchmark and time-horizon issues; planning and policy bottlenecks; capacity issues for enabling infrastructure; political infighting around priorities; and aligning the incentives to support the transition.

Understanding these quandaries is not helping us fix them because they are too deeply embedded. Can governments get us back on track? There are few signals that they have the convictions and mechanisms to do this. Jean-Claude Juncker, in his EC President role, very honestly said: "I know the policies we need, but they are not ones that will keep us in power".

So how do we mark this scorecard? Again, it's a ballpark answer but we are not doing well and nothing like on track to align with the climate outcomes sought. And there will be dire climatic consequences to mismanaging the Paris agreed global carbon budget.

What next?

We have written previously about the 4321[69] pin-code (see piece #35). The next phase needs to be about all units of power being aligned to the net-zero challenge and reaching agreement on policy levers and wider incentives. For the investment industry, this is using its democratised power to engage broad societal support and applying its corporate muscle to engage with the private sector to reduce the destructive effects of business externalities. And, in tandem, using its soft power on government to make progress on the key policy measures like a price on carbon, clarity on energy priorities and taxation consistencies. It is through this soft power on others where the investment industry's pin-code multiplier effect can be most effective to catalyse change. This is about the investment industry taking a systems-leadership position to ensure the system can support the future returns needed. You could call it enlightened self-interest.

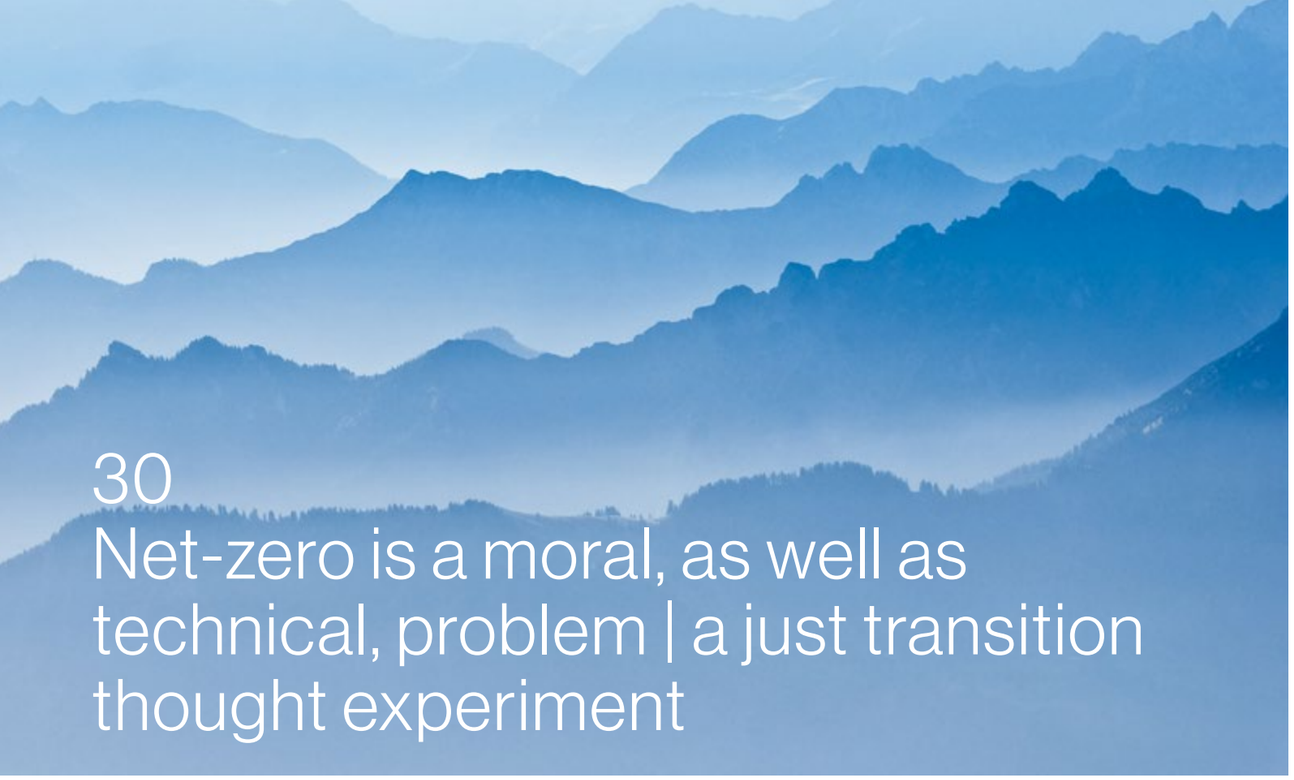
We can do this. But we are still looking like we are in the starting blocks. We now really need the power of 'and' in thinking and action that is systemic and holistic. And stronger leadership that is joined-up, agile and relentless. And recognising the critical ethos that when we're in it together we're stronger together. And we are truly in this together.

So far, so good – but climate is not solely a technical problem, it is also a deeply human problem, both in origin and in impact. Our journey must therefore include a consideration of society. The next piece opens the door, by making the case that net-zero is a moral / ethical problem. The piece that follows storms through the opening by arguing that our heads alone are insufficient. This journey will, and needs to, involve heart-pain.

[67] In the MSCI Net-Zero Tracker for May 2023, scope 1 emissions for equities in the MSCI ACWI IMI index are estimated at 11.2 Gt CO2e and have gone sideways since 2019. Only 19% of listed companies are aligned to a 1.5C pathway while 51% of listed companies align with warming equal to or below 2C

[68] Focusing too much on the fuel of change (the supporting science, the technology, the costs) we can lose sight of the principal reason for change failure as not addressing the human frictions implied in change: the inertia, effort and emotional cost attached. With net-zero progress this is most seen in process blocks, disincentives and limits in resources

[69] The 4-3-2-1 pin-code is a reminder of the sources of power in the ecosystem to effect change where roughly four units of power reside with public policy, three with corporations, two with the investment industry and one with civil society. The critical need is for these four sources of power to connect in an effective combination where the product is far more than the sum of the parts. And the investment industry has the biggest reach, over other sectors, to achieve this.



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Net-zero is a moral, as well as technical, problem | a just transition thought experiment

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In this piece I will argue that 'net-zero by 2050' represents a forcing into a shorter time frame, of a transition that would occur naturally over a longer time frame. This introduces a moral dimension to our technical problem. It is the imposition of a social/environmental goal, with consequences for all. Towards the end I will introduce a twist that implies that NOT forcing the transition is actually the more morally-suspect choice. As a note, I consider the terms morality and ethics as interchangeable, and I am not implying any distinction by using one rather than the other[70]. Both are aimed at distinguishing between 'good and bad' or 'right and wrong'.

Economies are complex adaptive systems and they are always in transition. We can call this a 'natural' transition. All transitions create 'winners and losers' – some businesses grow and hire new workers, while other businesses die and jobs are lost. If we assume that the market's invisible hand is the most efficient allocator of capital, then it follows that natural transitions yield the lowest financial cost transition. By the same assumption, natural transitions are also the most orderly form of transition.

Human history has witnessed a number of major energy transitions. Initially we relied on mechanical power derived from wind (history rhymes!) and water, but transitioned to mechanical power from steam (coal). We then transitioned from mechanical power to electrical power (still steam, from burning hydrocarbons). These major energy transitions typically took a century or more to complete. Our current energy transition from fossil electricity to clean electricity started a number of decades ago. Left to its own devices, the transition would continue to run at its own pace, until complete.

The question then becomes "does the Paris agreement attempt to force the transition to happen more quickly than its natural rate?". In other words, would the transition naturally complete itself by 2050 and within the carbon budget that is consistent with no more than 1.5C of warming?

I will assume 'net-zero by 2050' represents a forcing of, say, 80 years' transition into 30. That means we need to understand the characteristics of a forced transition. By definition, a forcing means some form of non-market intervention is required to achieve what the market cannot. In turn, this implies:

- Greater dispersion between and/or greater numbers of winners and of losers
- Greater likelihood of structural unemployment (forced transitions destroy existing jobs faster than the natural rate of job creation eg the UK under Thatcher)
- Some combination of higher aggregate cost, greater disorder and/or higher volatility of prices.

[70] See, for example, *What's the Difference Between Morality and Ethics?* Britannica

Consequently, a forcing implies that some (social/environmental) goal is deemed more important than a sub-optimal financial / economic outcome (which could include social pain).

In this light, why do some object to a goal of achieving a 'just transition'?

- Either (1) the necessity of the forcing is not universally agreed,
- and/or (2) they judge the cost/pain of the transition to outweigh the benefits,
- and/or (3) the benefits of achieving the goal will be inequitably* spread,
- and/or (4) the costs/pain will be inequitably* spread.

For a natural transition, arguments #1 and #2 fall away. There is no pre-determined goal, and no forcing towards it. We may, however, want to invoke arguments #3 and #4 if we believe a better distribution of outcomes was desirable and feasible. We conclude that even natural transitions can throw up moral problems.

For a forced transition all four concerns are likely to be in play:

- **#1** – different groups will disagree over the necessity of forcing. Proponents believe science provides sufficient evidence that holding temperature rise to 1.5C is the 'correct' goal. Opponents will generally back the market and a natural transition.
- **#2** is problematic. If we were fully cognisant of the likely pain when accepting the necessity of forcing then we can reject #2. However, it is possible that the degree of likely pain was not fully understood when committing to net-zero/agreeing to the forcing (raising the prospect of reneging on commitments).
- **#3** and **#4** show that a just transition is also a moral problem. From above, a forced transition amplifies disorder and dispersion, and increases the likelihood of structural pain. A just transition is actually a call for redistributing gains and losses in the knowledge of forthcoming cost and pain.

Given the logic of our thought experiment, a forcing entails a net cost (relative to unforced) and therefore a just transition is more accurately seen as a redistribution of cost.

What should the investment industry make of this? Clearly, if we hold transition-losers we should expect a hit to our returns. However, if we hold transition-winners we have a potential just transition problem (we own the gains, which could be redistributed).

Fiduciary duty probably makes the idea of voluntary redistribution untouchable for investment, however redistribution could be 'done to us' by our investee companies (they decide to treat better their employees, suppliers etc so our residual profits are lower), or by governments (higher taxes, whether windfall or general). This raises an important question: are notions of a just transition important to us as citizens, but out-of-bounds for us as investment professionals? The professionals I speak with, genuinely want to see a just transition but the mechanism for achieving it is not year clear.

This brings me to the twist in our tale.

So far we have compared a forced transition with a natural transition. The imposition of a social or environmental goal within a forced transition has been portrayed as 'morally loaded' relative to the more 'morally neutral' natural transition. I will now introduce a critical threshold (carbon budget) beyond which, by definition, bad outcomes start to accumulate. Please note, I am using 'outcomes' as a very broad term – much broader than financial cost alone.

Can we have any confidence that the natural transition will complete itself within the remaining carbon budget? I don't think we can have any such confidence. A natural transition uses the profit motive to drive an efficient allocation of capital, and the carbon budget is not part of the profit calculation. It would be a secondary objective (a constraining / forcing one at that).

But can't we make the carbon budget part of the profit calculation by introducing a carbon (emissions) price? We could. But then we would need to debate whether (1) we had introduced a forcing mechanism by the back door, and (2) if it would help.

But why would it not help – surely making emissions expensive would lead to less of them? If the goal is to reduce carbon emissions then, agreed, a carbon price should help. But there is no guarantee a carbon price would keep us within the carbon budget, because we should not expect a price to eliminate emissions. An official price makes an activity legal. And so, if I can make a profit after paying for my emissions, then I am incentivised to emit as much as possible. A strictly enforced budget requires a quota not a price (ideally, a quota and a price).

OK, get that. But doesn't that then mean the 'morally loaded' forced transition minimises the future accumulation of bad outcomes? Which means that a natural transition that doesn't respect a critical threshold is actually 'morally loaded' relative to the more neutral forced transition? Exactly. That is why climate change really is the biggest market failure of all time.

We can conclude, then, that as well as being a technical problem, net-zero is also a moral problem. First, in terms of accepting the necessity of the forcing, and second in working out what responsibility we carry for actively assisting the system (that pays our returns) to transition to its new state. >>>

* Notions of inequity necessarily involve moral / ethical judgements

31 Heart knowledge what's love got to do with it?

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For me it happened in a very old room. I was told by the facilitator that the group would now take part in a structured exercise. My role was to say nothing. I sat and listened, and by the end I was angry. I don't often get angry, but I was Greta Thunberg-level angry. I had passed from head knowledge to heart knowledge. It was May 2019.

I thought I knew about climate change. I had already been talking about it as one of the two biggest risks facing humans for a number of years. But this was only head knowledge. It was an intellectual exercise. I could pick it up, and put it down when I chose. Heart knowledge can't be put down. It can be supressed for a while, but it can't be ignored indefinitely. Heart knowledge has been internalised. It is now part of who you are.

Given that this is the Thinking Ahead Institute, it is worth stressing that I am in no way suggesting we subjugate our thinking to our feelings or emotions. We are still talking about knowledge. In fact, we are talking about the exact same knowledge. The difference is how the knowledge affects our behaviours. Head knowledge implies rationality and cost-benefit analyses; a careful weighing up of probabilities and consequences and the like. Heart knowledge has access to all this data, but runs it through a new algorithm. I ask that you stay with me here, as I am going to call this algorithm 'love'.

Let me try out a couple of illustrations – one preposterous and the other more reasonable. Imagine one of my three children falls into a dangerous ocean current. Should I use head knowledge to assess the probabilities and consequences, and possibly conclude that being alive for the remaining two is the best course of action? Or should I let love decide for me – use my heart knowledge and jump, whatever the possible cost?'. For our more reasonable illustration, consider a subsistence farmer and her family, somewhere in Africa. Head knowledge recognises that climate change and the associated increase in extreme weather events is going to make life more difficult for her. Heart knowledge knows this too, but also feels a twang of pain. In neither case do we change our portfolio at all. But who knows, maybe we consider an investment opportunity that crosses our desk three months later slightly differently?

Where am I going with this? Well, a number of threads are starting to entwine in my head. First, I admit to a degree of personal frustration at the lack of movement relative to (my judgement of) the size of the need in respect of climate change. I am actively wondering if there is a lot of head knowledge out there, that hasn't yet made it to heart knowledge.

Second, I have been reframing climate change and seeing it not as a problem, but as a symptom. A symptom of the working of the system – a human-built system. If we have built the system that has caused the problem(s), then it is up to us to fix it. The polar bears are not going to fix it for us. So how do we best fix a system so that it is fit for human habitation? With head knowledge alone? Or do we need heart knowledge too?

Third, as a team, we have started to ponder the future of work. We think it is becoming increasingly apparent that individuals want and deserve personal attention from their employers. For their part, employers can (will need to?) become more human, and approach every issue from a human angle first. We believe organisations will need to provide purpose and meaning as key attractions for talent. I interpret this to be a shift in emphasis – to more fully embrace issues of the heart alongside the traditional strengths of the head.

Then there is the net-zero journey. I (and we, as a team) foresee that the investment decisions could become harder and harder as time passes. If the rate at which I have committed to decarbonise my portfolio is faster than the opportunity set is actually decarbonising will head knowledge alone show me the way forward? Or might heart knowledge make the decision making easier?

My final thought is a revisiting of an idea within Kate Raworth's *Doughnut Economics*. She outlines five different levels of response a corporate could take in confronting planetary boundaries and social floors ranging from 'do the minimum' through 'do my fair share' to 'be generous'. Head knowledge might, by working very hard on enlightened self-interest, get a bit beyond 'fair share' – but the natural domain of head knowledge is 'fair share'. Being generous is the natural domain of heart knowledge – because love is about choosing to put the interests of others above self-interest.

If there is any merit in me entwining these threads into a stronger cord, then it suggests adopting a leadership position in our industry that requires us to bring more of our heart to work, not to replace but to complement our heads. In short, human solutions to human-caused problems will require us to be more fully human at work.

If you accept my premise that the essence of love is about raising the priority of others relative to self, then a number of things should follow directly and immediately – as alluded to in my list of thoughts above. On climate change specifically, heart knowledge (or love) should cause us to become justifiably angry at the injustices climate change brings. It should also compel us to spend more of our self in pursuing solutions.

These thoughts work at the level of individuals. This piece will either resonate with you – or not. But the mapping to organisations is more difficult. Organisations are comprised of people but are not people. So I wonder if an organisation's equivalent to heart knowledge shows up in its purpose? At TAI our purpose is to serve the end saver, and consequently we strive to mobilise capital to secure the sustainable future our end savers need and deserve. If this much resonates with you, then why not engage more deeply with TAI and strive together to mobilise capital to address the climate challenges.

In the end, what do we want to be remembered for? The power of our intellect? Or that we loved, and spent ourselves for others.

We arrive at the society hub. Here we consider an obvious topic – income inequality – and a topic that is likely less obvious – should society leave some technologies on the shelf? >>>

32
Income inequality: A case of tunnel vision?

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Globally there has been a significant decline in between-country inequality in the last 40 years[71], even though some of that progress has been undone recently by COVID and rising food and energy prices[72]. At the same time, inequality within many countries has been consistently on the rise for decades now and is approaching very high levels in many developed countries[73]. It is a growing concern as inequality matters for several reasons.

High levels of inequality have societal consequences – people feel let down by their governments, which in turn leads to increased instability. Increasing concentration of incomes also reduces aggregate demand and undermines economic growth. There is a lack of persuasive evidence that high levels of inequality boost the economy or improve wellbeing[74,75]. It is therefore clear that tackling inequality is important and necessary, not only for social reasons but also because a healthy economy underpins the performance of all investments.

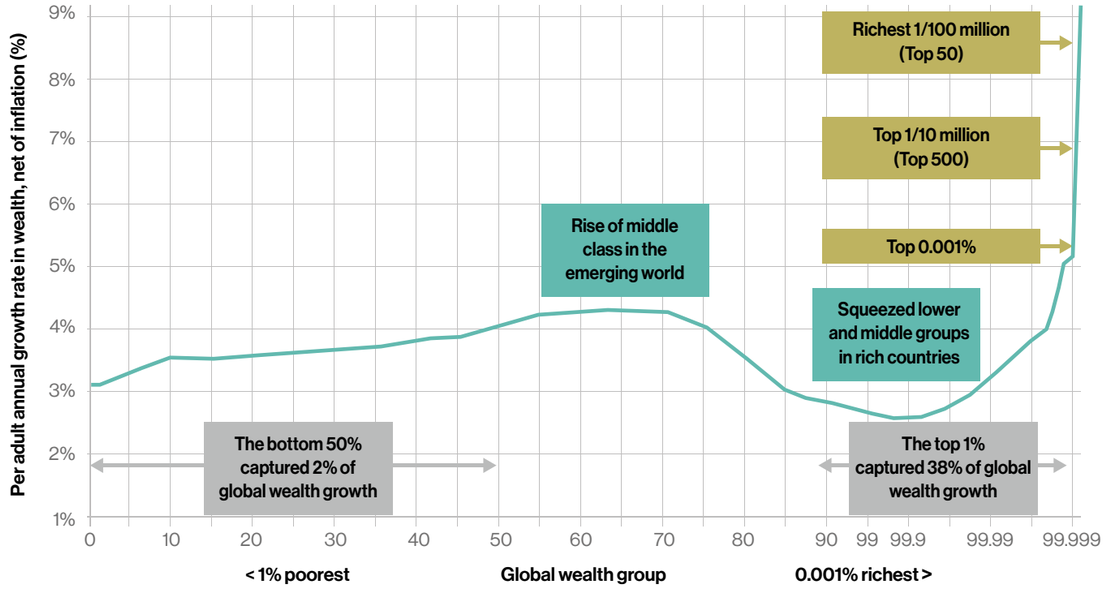
When it comes to climate change, we tend to focus on carbon emissions, forgetting other important, interconnected issues such as air pollution, biodiversity loss and water scarcity. Might we be making the same mistake with inequality, limiting our focus to the distribution of income and forgetting other important issues such as unequal access to education, employment and health care? After all, fairness is much more than just equal financial outcomes.

Income inequality is a widely used approach to measuring inequality as it is simple and trackable. Other inequality issues are also, however, very important and should not be overlooked.

A recently published working paper *Intergenerational Income Mobility in England and the Importance of Education* found that the level of mobility varies significantly across the country and points to educational achievement as one of the reasons for it. "More than 45% of the variation in absolute mobility across areas can be explained by differences in **educational attainment** of children from low-income backgrounds across areas for women, while the equivalent for men is 25%." The report highlights that "this indicates education policy has an important role to play to equalise opportunities of children from low-income families across the country, though this will not be sufficient to fully do so on its own."[76] Hence the need to look at this in the context of **wealth inequality.** This is where the biggest divide in society is, and this divide has been rapidly increasing in recent years. According to the *World Inequality Report 2022*[77], the global top 10% owns 76% of total household wealth while the global bottom 50% owns 2% of wealth. The graph below shows how the rich have accumulated wealth over the last 26 years.

[71] *World Inequality Report 2022*
[72] *"Terrifying prospect" of over a quarter of a billion more people crashing into extreme levels of poverty and suffering this year,* Oxfam, April 2022
[73] *Top Incomes in the Long Run of History,* Anthony B. Atkinson et al., 2011
[74] *Happiness, income satiation and turning points around the world,* Andrew T Jebb at al., 2018
[75] *How rising inequality hurts everyone even the rich,* Washington Post, February 2018
[76] *Intergenerational income mobility in England and the importance of education,* Pedro Carneiro et al., June 2022
[77] *World Inequality Report 2022*

Average annual wealth growth rate, 1995 – 2021



Source: World Inequality Report 2022

Wealth inequality potentially matters more than the distribution of income. In a society where asset ownership is highly unequal, social mobility becomes severely diminished[78] which has a significant negative effect on aggregate economic growth and reduces the effectiveness of educational interventions.

These findings point to the multifaceted nature of the inequality issue, which requires a combination of countermeasures.

While human flourishing should be the ultimate goal of economic activity – it could be argued – the current system appears to have misaligned priorities and falls short of this ideal when it comes to long-term planning and accounting for externalities. Logically therefore, societies cannot flourish with the current level of inequality, so a new system – which has overall public good and wellness as one of its overarching priorities – needs contemplating.

Much of this thought is contained within the "wedding cake" of sustainable development goals (SDGs) produced by the Stockholm Resilience Centre[79]. It illustrates the order and significance of economy, society and ecology. Resilient economies are underpinned by a healthy and functioning society, which is underpinned by a healthy biosphere. In other words, elevating the solving of environmental issues can be seen as part of strengthening human capital and reducing inequality.

In this piece I have tried to show that there are many aspects to inequality and therefore there are many required interventions. A lot of responsibility for dealing with rising levels of inequality lies with the public sector. However, the investment industry also has a part to play, albeit with a narrower field of influence. Here income inequality might be the more accessible lever. The UN PRI report *Why and how investors can respond to income inequality*[80] specifically focuses on investors' ability to influence the income inequality issue and provides a list of practical actions.

The concept of inequality is also deeply embedded within the desire to see a just transition to a net-zero economy. A Thinking Ahead Institute working group, when surveyed, agreed that addressing a just transition will require a culture reset. This means each investment organisation needs to decide whether inequality and addressing it matters to them right now.

These decisions will determine whether the necessary culture reset is possible. Inequality will only be reduced if enough people work against it. If we do not reduce it, inequality will continue to pose a risk to all of us through the myriad of negative effects it has on society.

[78] *How Inequality Leads to Industrial Feudalism,* Hanna Szymborska and Jan Toporowski, Institute of New Economic Thinking, 2022
[79] *The SDGs wedding cake,* Stockholm Resilience Centre
[80] Building Human Capital, World Bank, October 2018, *Why and how investors can respond to income inequality, PRI and TIIP, 2018*

33
Leaving technologies on the shelf

CLICK HERE FOR ORIGINAL ARTICLE

"We need to find a way to leave some technologies on the shelf"

Mike Berners-Lee, TAI sustainability summit, 5 November 2019

This document has been written as a response to the above quote. Because the underlying concept is so important – all technologies offer private benefit but not necessarily a public benefit – this is published as a draft document and comments and contributions are welcomed.

The choice of style is deliberate – an attempt to be entertaining as well as informative. This reflects our belief that we learn best when having fun. It is therefore as much an experiment in form as it is in substance.

For context, the thinking below is also built on the John Sterman quote – "there are no side effects, just effects". From this we derive the principle that all processes (and therefore technologies) both create value and destroy value (throw off waste)[81].

The infinite library of technologies

As a thought experiment, imagine that we discover a hole in the space-time continuum large enough for all humans to settle comfortably for a while. After removing all the humans, we let time tick forward on planet earth, and we watch.

The earth without humans

Nothing much appears to happen at first, but that is more a function of our impatience as observers. As we settle, we observe many things. The built environment becomes greener as tarmac and concrete rupture under the pressure of plant life pushing through. The mix of animal life changes drastically. Predators enjoy a brief bonanza – cows trapped in fields – but then the easy pickings run out and their population crashes too. Avocados and oranges fall to the ground unharvested and don't get to travel the world.

As time rolls yet further on we see coastlines change and parts of cities move under water. The built environment takes a battering from storms and the constant change from hot to cold and back, and wet to dry and back. We begin to realise that if we watched the movie long enough nature would, eventually, level everything we had built[82].

There is an interesting question that we are not qualified to comment on. What is happening to the global average temperature? We do not know whether nature would be able to reabsorb the carbon in the atmosphere and return the planet to the climate niche in which humans thrived; or whether nature would take the gift of anthropogenic carbon and move to a new climate niche altogether. To express this in a different way, are we already past sufficient climate tipping points[83] that nature would need the assistance of (large-scale) technology to maintain a human-friendly climate niche?

The library

That last question leads us back to the hole in the space-time continuum where humanity waits. While some of us have been observing Earth, others went exploring and discovered the entrance to the infinite library of technologies[84]. They report back that all possible technologies are contained in the library, all precisely detailed so that the necessary components could be built[85,86]. For carbon capture alone there appear to be thousands of rooms, each containing the descriptions of thousands of technologies.

The planning meeting

Sensing that the time to return to Earth was approaching, the elders called a meeting. The sole topic for discussion was which technologies to choose from the library to take back. One earnest contribution was "none of them". When asked to explain why, the contributor noted that Earth had now settled into a new state. Even humans going back, let alone taking technology with them, would disrupt things. Animals would diminish as humans harvested the avocados and oranges (and the animals). It would not be possible to predict the impact on the ecosystem, so how would we know which technologies would be best?

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[81] See *The value creation boundary* (short) and/or *Mission critical: understanding value creation in the investment industry* (long), both Thinking Ahead Institute
[82] We are watching the second law of thermodynamics in action – entropy (disorder) always increases
[83] See, for example, *Climate tipping points — too risky to bet against*, Tim Lenton et al, Nature 27 November 2019.
[84] This library is loosely modelled on *La biblioteca de Babel* (the library of Babel), a short story by Jorge Luis Borges.
[85] We could mirror the library of Babel and state that most of the technologies described are gibberish (eg square wheels) but that is not necessary or useful for our current ~ thought experiment.
[86] We view this thought experiment as being compatible with Brian Arthur's description of technological progress as being combinatorial *(The nature of technology 2009).* So the library's instructions for a particular smart phone would refer the reader back to the instructions for a calculator, phone, gps receiver, camera etc.

The contributor went on to describe how they viewed the planet's carrying capacity:

- The Earth will receive a free of gift of daily sunlight[87] for about 5 billion more years. That defines the upper limit for sustainable energy use[88]
- That sunlight should be shared with plants, as plants are quite useful as a source of food and medicines (ie we should not carpet the Earth with photovoltaic cells)
- Given their share of sunlight, the plants would gift humanity with an annual dividend (avocados, oranges, and cubic metres of wood)
- The food should be shared with animals, as animals are quite useful
- Given their share of food, the animals would gift humanity with an annual dividend (fibres for clothing, companionship, and food that stays fresh until needed)

The carrying capacity of the planet for humans is therefore determined by the sunlight not spent on plants, plus the dividends from plants and animals.

There was uproar in the meeting which took the elders a while to settle. It turned out that the vast majority were not keen on wooden kettles. This led to a vexed conversation over how to define carrying capacity for metals and minerals. One bright spark suggested that the rate of replenishment could be proxied by the annual rate at which lava brought new minerals to the surface, so maybe the rate of extraction should be no higher than that?

Sustainability and intergenerational fairness

This comment triggered an important digression. While most agreed that this statement was a reasonable definition of sustainability – the rate of extraction being no higher than the rate of replenishment – it would be very restrictive. Rather, the meeting should endorse the concept of intergenerational fairness. This would allow the current generation to extract resources at an unsustainably high rate, but use them to build a stock of assets that would benefit future generations. The response to questions about potential abuse of the implicit trust in the arrangement was 'self-regulation'. Which didn't feel quite right, but no better solution was forthcoming[89].

The circular economy

To try to get the meeting back on track (the selection of technologies) one group suggested unifying around a principle. Instead of reinstating the linear economic system (take-make-use-throw) humanity should operate a circular economic system (reuse-repair-repurpose). This was seen as addressing the metals and minerals question raised earlier. Once a quantity of them was 'at play' in the economy, then the expectation should be that they would continually circle around the economy and not head to land fill. In other words, recovery or future use should be designed in to the first-use product.

This quickly led to a second principle – waste minimisation[90]. This was subtly, but importantly, different to efficiency maximisation which focuses on the amount of desired output per unit of input, rather than the amount of undesirable output produced as a consequence. Together, these principles would materially influence which technologies to choose.

Powering the circular economy

The discussion morphed naturally into how to power this circular economy. Many were surprised that there wasn't immediate and unanimous agreement to the principle that all energy should be zero-carbon (when operating). A group calling themselves pragmatists pointed out that the temptation to use the calorie-dense fossil fuels that was just sitting there would be too great. Therefore, given the need for some form of always-on (base load) power, we should burn fossil fuels – but only up to the rate that the earth could naturally capture the CO_2 thrown off. At this point the meeting exploded into a cacophony of voices. Various arguments had ignited, including:

- Proponents of nuclear fission for base load power versus those totally against the danger it posed[91]
- Proponents of battery storage to cover the periods when renewal sources were not supplying energy
- Those questioning why 'always-on' was even necessary, and
- Those suggesting a mass trawl through the infinite library of technologies for nuclear fusion, or equivalent magic-energy bullet (versus those who insisted there would be some unintended negative consequence).

Precisely no-one argued against the need for energy[92].

[87] About 1 kilowatt per square metre of earth's surface. A typical US household uses 30 kilowatt hours per day, which is equivalent to 6 hours of sunshine falling on $5m^2$.
[88] Wind power is derived from sunlight too.
[89] The ideas within this paragraph are discussed at greater length in *Bathtubs, intergenerational fairness and the sustainability end game,* Thinking Ahead Institute, 2019
[90] While this principle appears simple and obvious, the discussion behind it was fascinating. It hinged on the non-existence of perpetual motion machines. As no technology could be perfect, it would be a drain on system resources in some manner, and it would produce waste in some form. If untreated, the waste would eventually fill the environmental sink into which it was dumped (see *Past returns aren't even a good guide to the past,* TAI 2019). If treated, a new technology would be required, which would use system resources and produce its own waste... Hence, choosing technologies to minimise waste became extremely important.
[91] For a comprehensive and balanced review of nuclear power see *Are you clear on nuclear?*, a LinkedIn post by John Belgrove, 18 Oct 2019
[92] Consider cooking. Cooking requires energy but also allows humans to extract more calories from a given weight of raw food. The simplest cooking technology is an open fire, but 8bn people would burn a lot of wood, or other matter (let alone the health problems and dangers associated with open fires). Cooking with electricity is safer and more convenient, but creating the machinery to generate and distribute electricity, and to receive it and convert it into cooking heat requires us to melt a lot of rocks.

Social and ethical implications

Again, it took a while for the elders to restore order. They had noticed that one group had remained silent throughout the meeting. The eldest addressed them and asked if they had nothing to say on the choice of technologies. Their spokesperson replied that they didn't start with technology; they started with their values. They were happy to adopt any technology that supported or enhanced their values, but they rejected any that weakened their values. This assessment was only possible by trialling the technology and observing the impact[93]. So, they apologised, they couldn't assist in the choice of technologies to take back. But, if it helped, they could contribute another principle: any technology has social and ethical implications.

Progress, but no answer

The meeting ran long. And it failed in its singular purpose to determine which technologies to choose. It had, however, settled on some important principles that would guide the eventual choices.

a) Technologies that allowed resources to be extracted at a faster rate than the rate of replenishment should be used with caution, and under strict reporting and monitoring conditions

b) Technologies would be assessed for efficiency

c) Technologies would be assessed for waste minimisation

d) Technologies would be assessed for social and ethical impact.

Perhaps as a tongue-in-cheek comment, it was suggested that a committee be set up to review each technology against these criteria. As we were currently outside the space-time continuum, we had more than enough time to review the infinite number of technologies within the library.

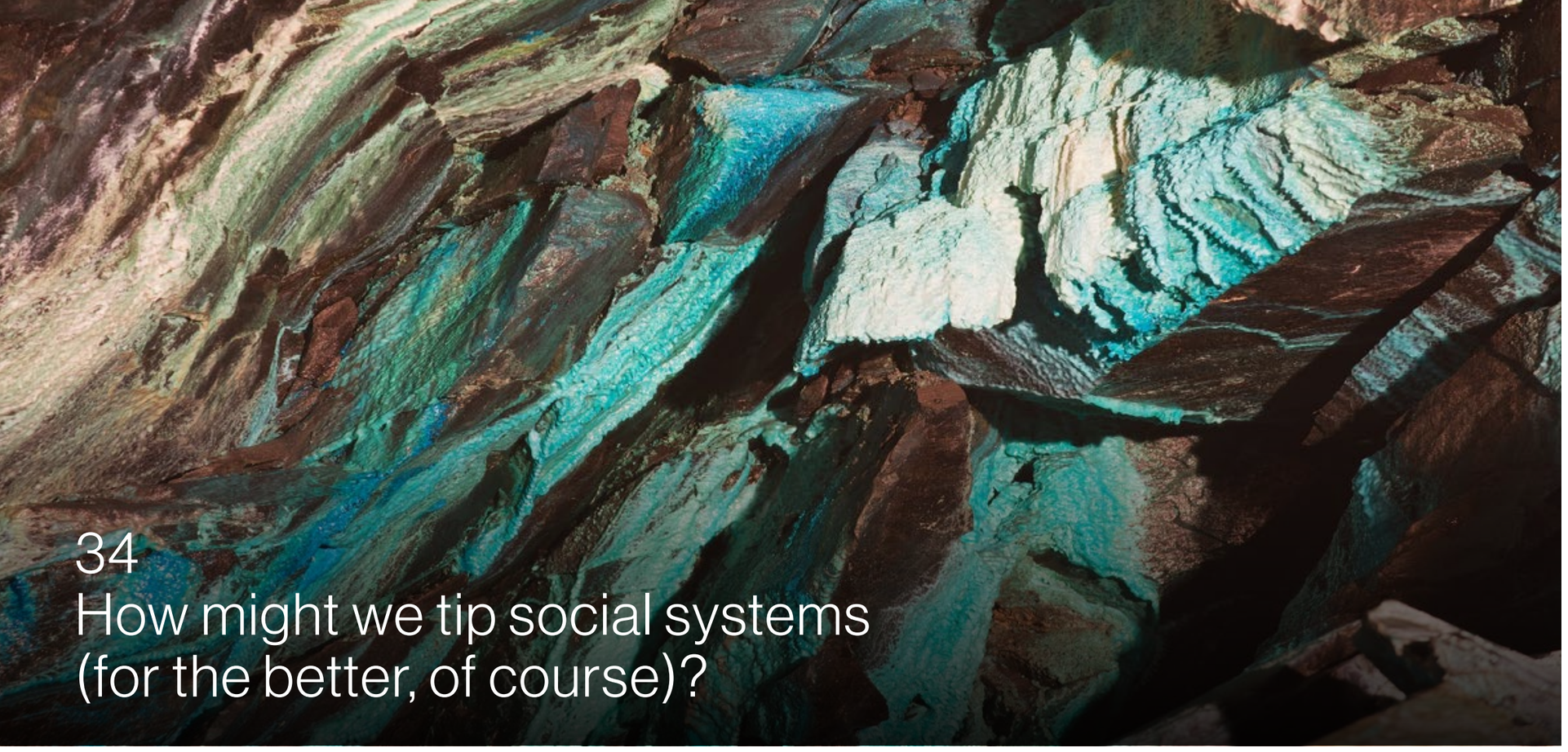
Leaving the thought experiment

Clearly, we do not have the luxury of stepping outside time to carefully consider what technologies to use. Nor do we have the option of carrying on as we are. At some level, technology is to blame for our current predicament. If we had never built coal-fired power stations, or so enthusiastically embraced air travel...

Therefore, through this lens, our choice can be characterised as between de-technologising (sorry!), which is the route advocated by the degrowth movement, and re-technologising (again, sorry!). It is inconceivable to the author that the majority of humans would choose the abstinence path, and therefore the future will be about harnessing technology. This document seeks to make the case that we need to "do technology" differently – specifically suggesting waste minimisation and social (public good) criteria. It is deliberately silent on the "how" – how do we assess a nascent technology for social and ethical impact? How do we structure incentives so that there is both private benefit (so it is funded) and public benefit? If there is merit in the ideas in this piece, then that work lies ahead of us.

The problem of the conflict between private good and public good does not just apply to the choice of technologies, as above. We will see it again when we return to consider carbon and the climate later. It is also a problem of governance. It is neat, therefore, that the path ahead of us takes us via governance to climate. >>>

[93] See *Approach Technology Like the Amish,* Cal Newport, September 18, 2017



34
How might we tip social systems (for the better, of course)?

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In September 2022, the University of Exeter convened an international meeting titled 'Tipping Points: from climate crisis to positive transformation'. Part of the conclusion, and the subject of subsequent work, is the idea that 'positive social tipping points' are probably the fastest and most powerful way of addressing the climate crisis. That is the origin of this thought piece – how might we tip a social system?

Let's start by creating a model to represent a generic social system. The model will be in the form of a network that has nodes and connections. The nodes will be entities that are capable of making decisions – so individuals and business (but with scope to go more abstract into algorithms, smart contracts and generative AI). The connections between nodes are flows. As we are considering social systems, these flows can include virtues like friendship, help and love, as well as more typical flows like information, money, goods and services.

Complexity science often refers to systems performing computation (they work out the best allocation of resources – the 'invisible hand'), so let's use computers as an analogy. A computer has an operating system, and the real-world equivalent is the 'rules of the game'. The 'rules of the game' is shorthand for a very large set of layered 'commands' which govern the behaviour of individuals and corporations. They include international, national and local laws, as well as unwritten values and norms that govern 'how we do things in this part of the network'[94]. They therefore encode the prevailing ideology (eg capitalism is the best way to organise an economy), amongst other things.

Similarly, the 'software' describes how the node processes incoming information and makes decisions. Some of the node's decision-making algorithm may be standard across most local nodes, but some of the lines of code are likely to be bespoke and dependent on individual context. For example, the majority of nodes at the present time are likely to have a component in their algorithm which encodes the following sentiment: "the products of fossil fuel companies are currently required for internal combustion engines; AND immediately cutting off the supply of those products would be more harmful than beneficial". We can imagine that the algorithm of a climate activist encodes a conflicting, or opposite, sentiment.

Using this mental model, we now have a line of sight to the answer to our question – how might we tip a social system? We can change the information flowing through the network; we can change the individual decision-making algorithms; or we can change the rules of the game that apply to all nodes.

In essence, our desire to tip a social system implies a number of things:

- The behaviour of the social system is currently suboptimal (against some objective; this is likely to be a value judgement)
- The behaviour of the components of the system might be suboptimal (against the larger, system objective)
- We have identified a mechanism by which we can easily change the behaviour of at least some of the components (a tipping point implies we are looking for small changes that can have a large effect)
- The change in behaviour of those components will propagate through the system, causing other components to change their own behaviour
- The aggregate result of the changed components, will be significant change at the system level.

Our mental model shows how we might attempt to intervene within the system to bring about the change we desire. Most powerful, but most difficult, is to change the ideology (operating system). For example, we could seek to replace "growth is good" with "growth that damages the ecology or the environment is bad". We can also lobby for changes to the law. Many countries have already signed into law net-zero emissions commitments, opening the door for further laws to aid its achievement. This would change the societal incentive structure (the rewards and punishments attaching to behaviours). For example, a law that changes the price structure will trigger multiple behaviour changes.

Next, we can try to change the software. Because we are dealing with social systems, this will include a consideration of values and ethics, not just beliefs about how the world works. For example, does a human life in the global south have the same value as a human life in the global north? I would argue that our current algorithms imply it has a lower value. If that is an uncomfortable, or even abhorrent, thought, then you are free to adjust your own algorithm accordingly – but the change might not produce as much financial return. To push a social system over a tipping point, we are effectively looking for the equivalent of a computer virus – a change in code that spreads through the network, altering the algorithm of each node it 'infects'. This is what climate activists believe they are trying to do.

Finally, we can seek to change the information flowing though the network (the inputs to the algorithms). In a sense, this is what climate science has been trying to do.

In this thought piece I have only been able to sketch the initial idea. However, it seems to me that the conversation over social tipping points would be greatly enhanced if it included the change mechanism it was seeking to employ, in order to trigger the system change it would like to see.

[94] In the framing offered by Donella Meadows in *Leverage Points: Places to Intervene in a System,* our rules of the game relate to her three most significant (and hardest) intervention points – the mindset out of which the system arises; the goals of the system; and the rules of the system (such as incentives, punishments, constraints)

35
The 4-3-2-1 PIN code for a more sustainable economy

CLICK HERE FOR ORIGINAL ARTICLE

The investment industry is more focused than ever on sustainability. That does not, in itself, necessarily mean that the industry is becoming a force for positive change, of course. But it's a start.

As so often is the case, there is something of a saying-doing gap. While some firms are focused on working out what to do, others are more concerned about creating a convincing story.

But there's another gap, which is perhaps even more significant here. We might call this the doing-impact gap or, more technically, the intentionality-additionality gap. We may have certain intentions but how do we ensure that our actions create genuine and deliberate additions to what happens? This gap arises because it's not easy to bring about fundamental and positive change or even simply measure it. After all, just how far is it really possible for asset management organisations to truly move the dial on climate change, for example?

The fact is, no single party on their own can achieve as much as all parties working together. But everyone can play a part. And this dynamic is neatly captured in what my colleague Roger Urwin has termed the 4-3-2-1 PIN code.

The 4-3-2-1 PIN code is an impact framework. The framework assigns 4 units of influence to public policy, which is the single most powerful channel for effecting change. Laws and regulations can directly affect the things that matter most: resource extraction, pollution, emissions and the many other inputs to and outputs of our economic activity that contribute to the sustainability or unsustainability of our economy.

But while public policy is the most powerful, it's not the only channel. The 3 in our PIN code is for the influence of corporations. Corporations have a choice to make. One path is to focus on shareholder value and short-term profitability alone. They can choose to skirt the spirit of regulation. They can game the system, for example by regarding fines as merely a cost of doing business. Alternatively, they can see themselves as part of society, inseparable from the communities that they operate in, sell to and employ. They can reject the poisonous notion that they have no social responsibility beyond the maximisation of profits and instead pursue profits *with* purpose.

And the 2 in our 4-3-2-1 PIN code points to us in the influence of the investment community. Asset owners and asset managers lack the direct power of corporations to effect change, let alone the power of public policy. But investment decisions do have impacts. Asset owners and asset managers are stewards of the system. Shareholders who own, and profit from, corporations that pollute or exploit are not mere bystanders, they are active participants in the system and need to accept the responsibility that role brings. Intentionality on its own can too easily result in nice stories but no real change. Additionality demands that we invest in technologies that have a chance to make a real difference.

And the final unit of influence goes to the individual, the man or woman in the street. They exercise their influence as world citizens in a spectrum – consumers, workers, retirees, voters, travellers, campaigners, etc.

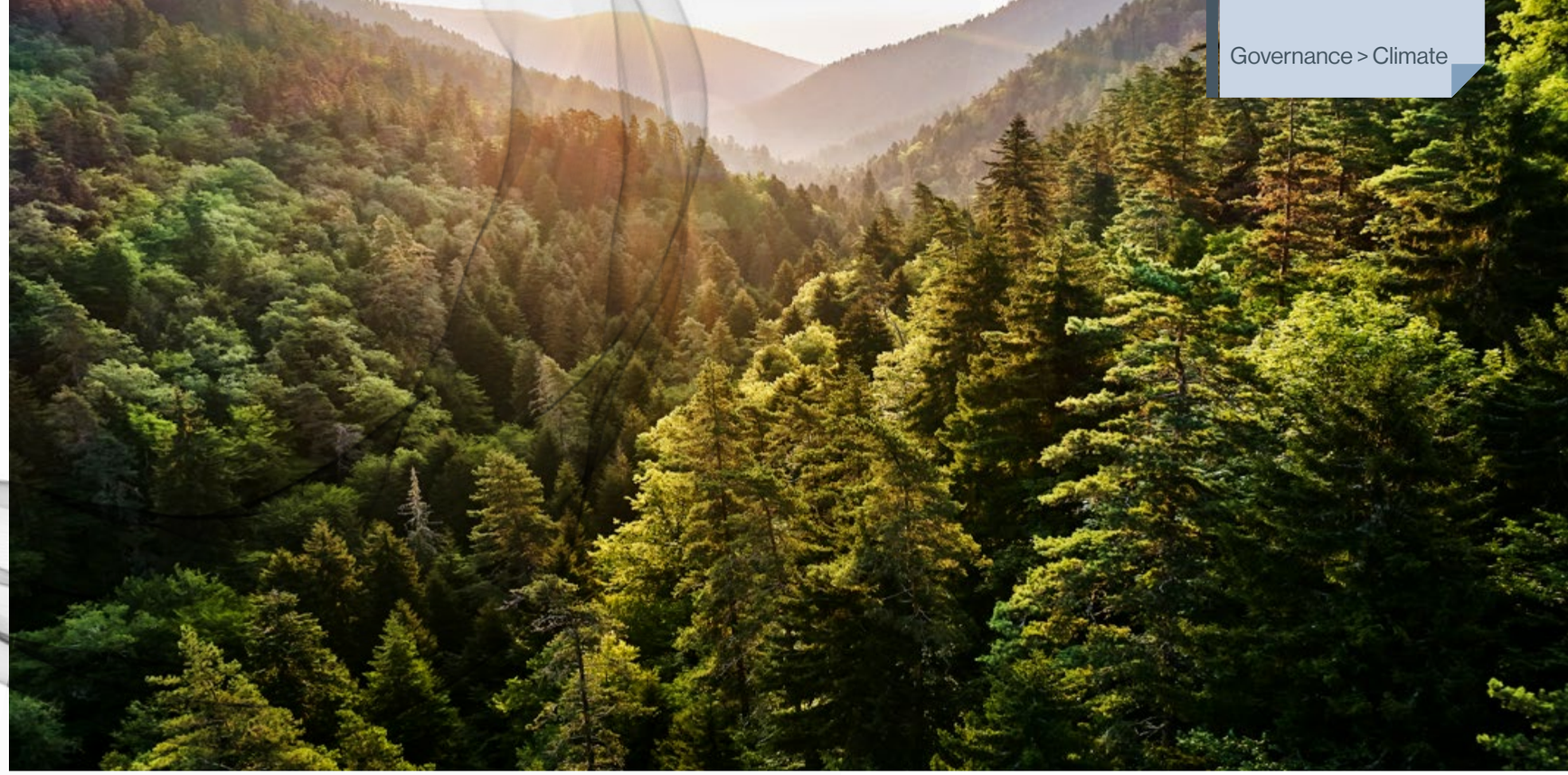
Hence, public policy; corporations; investors; individuals: these are the players in our 4-3-2-1 PIN code framework. Each has a role to play.

But the story certainly does not end there. The roles are interconnected. For example, individuals can influence public policy, hence having a bigger impact than is possible through their own actions in isolation.

The role of investors has arguably the most potential to connect these powerful forces. There are a legion of opportunities for investors to increase their impact by leveraging the 2 units of direct control into many more units by using their soft power to influence companies and public policy.

The intentionality-additionality gap (or, if you like, the doing-impact gap) represents the shortfall between our desire for a more sustainable economy and our ability to create it. The 4-3-2-1 PIN code is a reminder of the shared responsibility to unlock the impact that society is asking for and critically needs.

We now turn into the final straight and consider eight climate-related pieces. The first four pieces come from the Thinking Ahead Institute climate beliefs working group. This group produced a challenging set of beliefs that, if adopted and applied, would transform institutional investing behaviours. The beliefs were produced over 16 weeks by a team of nine and the first piece describes the importance of investment beliefs, how the group was formed and their operation as a superteam (hence the governance link). >>>



36
We need superteams to change the climate

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The need for climate beliefs

Climate change mitigation is about reducing carbon emissions; with the interim milestone of halving emissions by 2030. For the investment industry, this is not just about managing the scale and pace of the required transformation, but also acknowledging that the transition will be costly, and likely messy. Along with this come a host of other considerations: the environmental and social repercussions of the transition; manoeuvring the evolving legal landscape; and an increased role for ethics, particularly as they relate to a just transition. These factors bring additional complexity to an already challenging journey. We suggest that a well-thought-through set of climate beliefs will help an organisation manage the inevitable uncertainty ahead. Beliefs form the foundation for successful climate action. As you settle your beliefs, you will engage in honest dialogue on what the climate change challenge means for your organisation. Biases will surface and will be corrected. You will evolve your own thinking as well as influence your colleague's views. This richer understanding will enable you to align your strategies more closely to your climate ambitions. Establishing climate beliefs will create the right mindset and set up guardrails for effective decision-making.

The process is as powerful as the result. The extensive negotiations we witnessed at COP26 made one thing pretty clear, that process and politics are deeply intertwined. If the process set up to facilitate negotiations is inclusive, democratic and respectful, then the politics will be conducive in reaching a desired agreement. However, if there is little trust in the process, then the political dynamics will work against you. There is little point in establishing climate beliefs which don't have a buy-in from all key stakeholders. Investment is fundamentally a human-talent endeavour. The right processes champion both the humanistic and cognitive qualities of the group. We mention humanistic qualities here because beliefs can be deeply personal and heavily influenced by one's values. Which is why navigating a discussion on beliefs can be a delicate affair. But beliefs are also adaptive – they can evolve through active discussions, rational thinking and fresh perspectives. The right processes create safe spaces where these discussions can thrive.

Process guidelines

There are numerous ways to build a good process for settling climate beliefs. In this series we offer a compelling case study, from an institute climate beliefs working group, of one way to go about it – as well as contributions from some of the individuals who expound on the beliefs.

The institute's climate beliefs working group comprised nine self-selected individuals who signed up for a demanding weekly cadence of meetings at unsociable hours for the Pacific coast (10pm) and UK (6am). The individuals also agreed to operate as a **superteam**, in the light of the institute's current research and power of teams project.

The quality and quantity of the group's output in only 16 weeks was remarkable and should become apparent as this series of articles unfolds. But what is most remarkable, in my opinion, is how the work was produced. And I think I know one of the main reasons why.

Each call had five minutes dedicated to check-ins, and the same for check-outs. In other words, we deliberately allocated over 15% of our time budget to engage with each other's humanity, and not their work potential. By initiating this practice we learned about individuals' hopes and fears, concerns over sick pets and children, challenges and joys. We learned to trust each other and, for me at least, we grew to love (philia) each other, which also probably accounts for a remarkable productivity bonus. Being in the zone with a trusted and collaborative team was a career highlight, and a real advert for how superteams can produce exceptional results. Incidentally, of all the superteam behaviour changes we signed up to, it was the check-ins and outs that this, and other group members, chose to implement in their own organisations.

The experience was also confirmatory that we must bring our hearts to the climate crisis, as there is a distinct difference between heart knowledge and head knowledge, which is expounded on in a previous top1000funds article What's love got to do with it? (also #31 in this document).

While there are many other climate beliefs and ways of getting them settled, this group believes that this set of beliefs is necessary if we want to save the liveability of our planet. I commend them to you and the superteams approach which helped form them and hope both will inspire you to take an essential and positive step towards meeting our very challenging emissions reduction targets.

The document describing the climate beliefs is available here.

37
Consider a beautiful island...

CLICK HERE FOR ORIGINAL ARTICLE

By guest author, Herschel Pant, Senior Consultant Solutions at AXA Investment Managers.

Tim talked about love and potentially using 'heart knowledge' to solve for climate change (#31 above). Around the same time, I had the pleasure in joining him and 7 others (aka The Climate Super Team) in exploring what an asset owner's climate beliefs should look like. I still remain baffled as to why I agreed to a 6am weekly call with a group of people I barely knew, to discuss a topic I hardly knew (imposter syndrome alert!). Perhaps it was me tapping that 'heart knowledge'? Perhaps.

The first of these calls happened at the start of September, where we agreed to operate as a superteam – a first for all of us. Each one of us had different definitions, ideas, goals of what this meant – both about superteams and climate beliefs. We spent some time on understanding the 'why before the how' – aligning on a broadly clear plan of action with in-built phases to review progress. As Tim mentions in the preamble to this series (#36 above) the check-in / out was perhaps the most unique feature which helped us align over time. That is key – time. The weekly 'mini therapy' session helped all of us be more open and honest in our feedback.

Given it was a self-selected group, the 'why we need climate beliefs' was quickly agreed and acknowledged. The real debate was how ambitious can we / should we be. The practical side in all of us, sometimes, must be muted for a greater purpose. We, each of us, helped each other to do that at times. As a result, we eventually settled on answering the question "if an asset owner wanted to have real-world impact with their investments, what set of climate beliefs would help them achieve it". This was phase 1 – probably the hardest task for us. We eventually started referring to it as 'the island' phase. There was acknowledgement that these may be seen as too ambitious and therefore we may require a more 'practical' set of climate beliefs. We agreed to do this in phase 2 and review and update as appropriate in phase 3.

Building the island, ie the most ambitious set of climate beliefs yet, was quite a task. We started with about 35 beliefs across a range of topics with multiple rounds of voting and debate to merge them to a high-level list of 7. This was a big achievement – and that too in a few weeks! I personally thought this is a sign – 7 has always been rumoured to have a high spiritual connection. We naturally got to this number – we've cracked it, the beautiful island is built. Onwards to phase 2!

Change is the only constant. It's an age-old idiom for a reason. As we patted ourselves on the back for building the dream island, we had another choice to make. Do we make another, more 'practical island' or spend the time allocated to phase 2 to build boats to help people get to the island? As you might have guessed, we went on to building boats. What did that mean in our context? We agreed that a preamble is needed to provide context to our set of 7 climate beliefs. After multiple iterations of it and some subtle revisions to the beliefs, we had a coherent set of climate beliefs with a preamble. Bring on phase 3!

As part of our review process, we gathered some external feedback on what we had done, from people who we knew would be honest with us. We received all types – what we've done well, what we can improve etc. That 'practical' aspect which we had chosen to silence was a clear gap. We had a choice to make – should we adjust the climate beliefs to reflect practicalities of today or focus on persuading people that to make real-world impact, they need to rise to these beliefs. It was a tough one.

We all acknowledged that the process we followed was almost as powerful as the outcome. Perhaps, if we added a list of questions that we asked ourselves during this process, it would get those asset owners wanting to make real world impact to the same point – broadly speaking? As our final set of beliefs hopefully reflect, we want asset owners to act. Therefore, we agreed to spend time to get people to see the island and the boats to get there. To aid this, we felt a set of 5 questions that asset owners should ask themselves to begin their climate beliefs journey might be useful to kick-start the process. We then proceeded to answer these questions, to share how we have answered it while recognising that different asset owners would have different answers.

a) does your organisation see itself as an interconnected part of the global economic and climate system?

b) how does your organisation view climate change?

c) what does 'decarbonising' mean to you?

d) could there be any unintended consequences of solely focusing on climate change?

e) do you think fiduciary duty allows us to do anything about climate?

As the year and project were ending, we did a final review and recap of all the ideas and content produced – the dream island (ie set of climate beliefs), the boats to get there (preamble and questions to ask yourself) and a superteam case study to show that it can be done, if some time is spent on the why at the beginning. The review also made us realise that we could reduce / merge a couple of beliefs to make them more impactful. I know it would have been nice to have 7 beliefs but with 6, we can rest for a day. The executive team certainly deserves it.

a) **We believe climate change is an emergency and we are part of the economic system that must address this** (we must act)

b) **We have all the evidence we need to act** (we will act now)

c) **Acting ambitiously now will incur costs, but these will be materially less than those arising from a late transition or no transition at all** (acting now, while costly, will be cheaper)

d) **We believe the only way to change the climate trajectory is to adopt the stop, substitute and siphon framework** (we will invest differently)

e) **We will invest to create the future we all need which requires establishing new investment conventions** (we will think differently)

f) **We will actively participate in the collective action required to address climate change** (we must collaborate)

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Stronger together

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By guest author, Herschel Pant, Senior Consultant Solutions at AXA Investment Managers.

The world is, or perhaps feels, more divided now than it has been for some time. We've seen a continued state of discourse across many platforms that is driving people further away than bringing them together. It feels that is happening across the globe: Brexiters vs anti-Brexiters or vaxxers vs anti-vaxxers or 'nationals vs anti-nationals'. I was thinking about whether there is anything or at least one thing, one principle, that both sides could agree on. I believe the 6th and final climate belief, ie we must collaborate / we are stronger together can unify both sides. Whether implicitly or explicitly, all sides do already believe in it. Even those that deny climate change would agree that if there were more of them, then this 'net zero' fake climate propaganda would not happen. Collaboration, after all, is a sub-set of the stronger together principle.

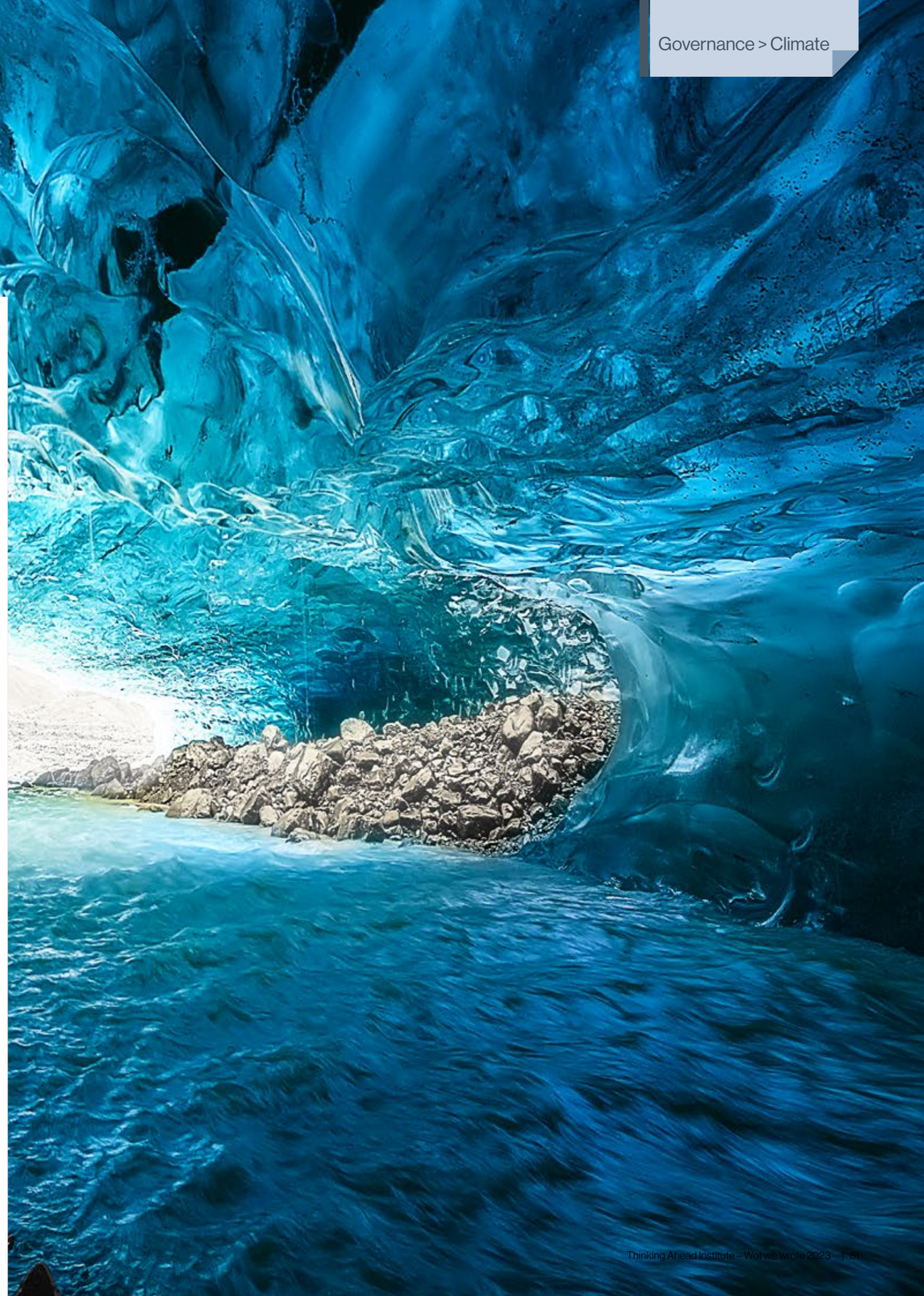
The challenge of climate change has many strands to it. From investing to measurement to equality – all of which will require action. Collective action. A strong collective desire to solve each of the strands while managing any unintended consequences of doing so will be required. It is a tough task and not easy for any one person, group, committee or society to achieve on their own. The journey will be new and unfamiliar. Just like long journeys or road trips one might have taken, they are a bit more fun if one has some company.

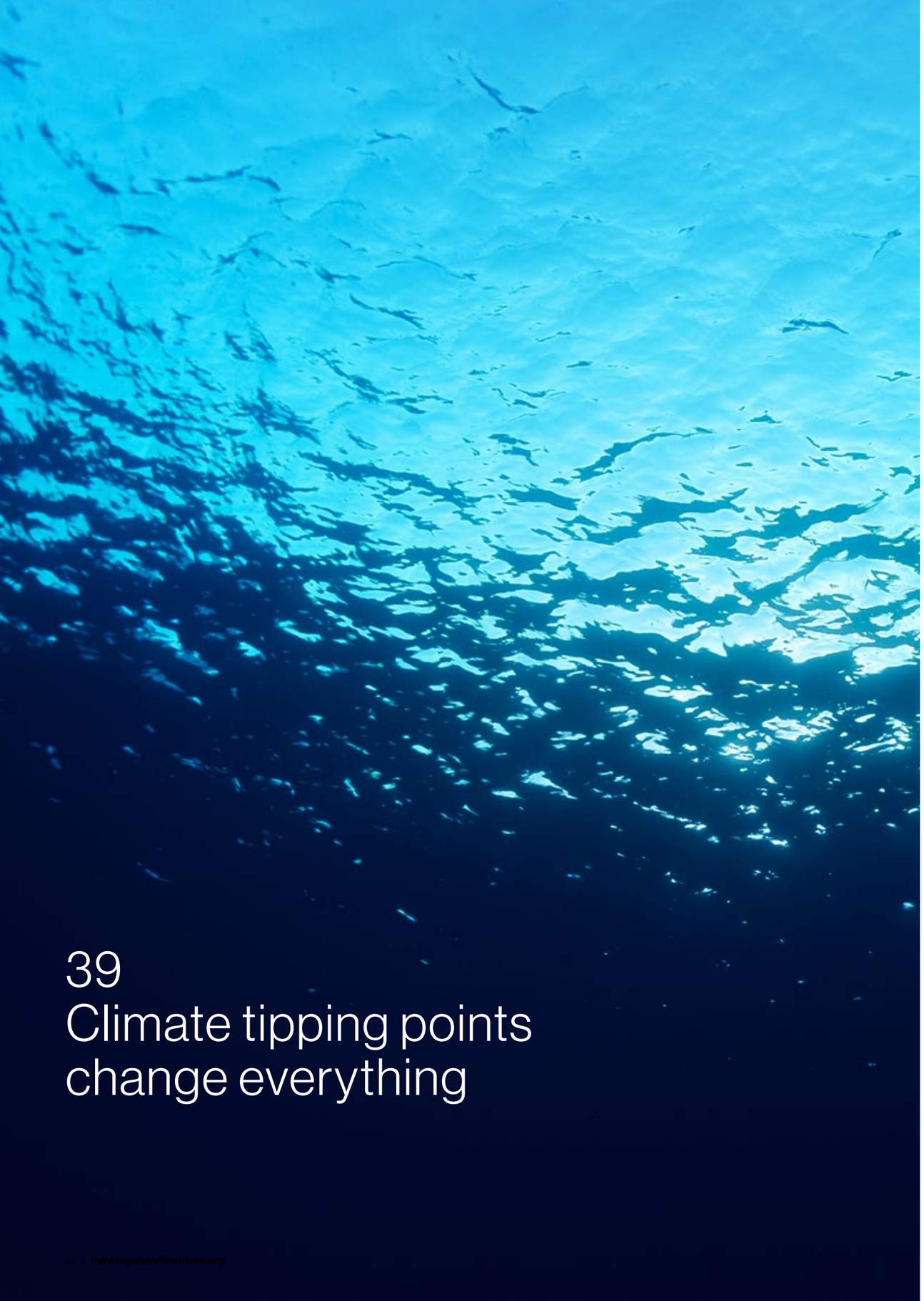
I remember one such road trip back home in India (around 2006). While we were going through central Delhi, a large group of youth were assembling with candles and banners. I read in the paper the next day (mobile internet wasn't as cheap to avail as now) that the protests were sparked by a recent judgement in a murder case and the youth of India's reaction to it. A high percentage of this outrage was a result of a Bollywood movie (Rang de Basanti). In summary, it depicted how a group of students fought against government corruption in a manner akin to certain freedom fighters. It was the first time I had seen a story creating actual change in people's actions – to make a positive change in society (and not just mimic your favourite character). Youth of India doing civilised protests! It happened repeatedly over the years as other social challenges of society were brought to light. Gandhi would have been proud.

Can you imagine something similar with climate? A DB pensioner, who lost their house due to flooding, later realises that his pension money – which he gets regularly with 100% certainty – could have been saved if they had responded 'yes' to one of the climate survey's conducted by the Trustees. It sparks protests by their grandkids – the now DC investors. A candlelight vigil is held outside the offices of the 5 biggest Master Trusts / pension providers at the time, asking them to change their investment strategy to ensure this doesn't happen again! Even the Colston-four were 'moved into action' following the story of someone in the US they didn't know. We do need more stories (read engagement reporting) to rally the value chain and be comfortable that we have to be on the right side of history – not necessarily the law.

Being a revolutionary asset owner isn't going to be easy. However, to solve for climate change someone (and I would argue each one of us) will have to make the hard choices. If you believe the argument that a pension is worth more in a world worth living in, then someone will have to step up and change the way we do things. Collaborate more across investors – not just in our portfolio. Commit to resources to help amplify the voice of the collective. Tell more stories to move people across the value chain. The good news is, we have already started with various investor groups already being formed – Climate Action 100, Net Zero Asset Owner Alliance, Institutional Investors Group on Climate Change et al. To aid that further, we have a Climate Super Team with its guiding questions and beliefs to help in navigating the journey.

There is a big challenge that we must acknowledge however – which is about fiduciary duty and the current interpretation of the laws that govern it. Just remember, revolutionaries were never known for following the law. They were known for challenging it – Desmond Tutu being one of them.





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Climate tipping points change everything

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This piece was inspired by an academic paper, Economists' erroneous estimates of damages from climate change (Keen et al, 17 Aug 2021). In the Institute we have championed the idea of T-shapedness, where the vertical represents our depth in our home domain and the horizontal our ability to reach across to, and connect with, experts from other domains. This paper is an example of T-shaped climate scientists reaching out to the economics domain.

The paper is a breathtakingly-polite savaging of the work (DICE model) of a Nobel laureate (William Nordhaus). In cartoon form, the paper says 'we are climate scientists; you economists have misunderstood and misapplied our work, and so your recommendations to policy makers are woefully inadequate'. It would appear that the economists have not been as T-shaped as we would have liked.

While the paper specifically targets the DICE model, because it was the first and therefore has been disproportionately influential, the points I wish to examine are common to all climate models estimating economic damage. First, no model yet incorporates the concept of climate tipping points. Second, I want to attempt to change your frame of reference from seeing climate mitigation as a cost, to seeing it as pure upside relative to the true baseline of losing everything. I will address these in reverse order.

To start, consider the language of economic climate modelling which includes the 'damage function'. Damage relative to what? Typically, damage relative to no climate change. The idea is to allow us to do a cost-benefit analysis. If the cost of mitigating climate change is greater than the likely damage (no benefit), then we should let climate change occur.

Then consider how often you hear phrases like 'doing X will cause a loss in GDP of Y%'. A loss relative to what? Well, typically, relative to GDP in the complete absence of global warming. Let's be very clear – at this point there is no feasible future which is free of global warming. It therefore makes no sense to claim non-warmed-GDP as the baseline for comparison. The problem is how much warming we should assume for the baseline, and the set of actions necessary to achieve that. For example, the agreements reached at COP26 suggest we are aiming for somewhere between 1.8C and 2.4C of warming. But actually delivering on those commitments will entail a whole bunch of forced transitions, from banned activities to carbon prices, and how do we project GDP from that? Will the 'new' GDP more than offset the 'decommissioned' GDP? I would like to propose a simplification and a new framing. There is a level of warming that will cause a 100% loss of GDP. We have not yet taken sufficient action to eliminate that as a possibility. So why not set that as our baseline, which would turn all those 'costs' of mitigation into investments that yield an attractive upside return.

To hopefully add credibility to my argument, let me turn to climate tipping points. These are points of no return, where a system goes from one state to another state with no path back. In our case we are talking about a climate system that has provided a pleasant niche in which humans have thrived, and moving it into a new state – hotter, and likely more dangerous and less pleasant – with no path back[95]. I feel sufficiently strongly that this is a crucial point that I will say it again using different words.

We have been living in an era of human-caused climate change (global warming). This is, actually, good news, because if we have been causing it, we can stop causing it and there is a path back to the old, pleasant and less-dangerous niche. However, if we continue to force the climate system to warm, and we trigger a tipping point then we pitch ourselves into a new era. In that era, climate change will be partly human-caused and partly nature-caused. This is bad news, because we could drop our emissions to zero but we will not, then, be able to persuade nature to 'un-tip' herself. There will be no path back to our pleasant niche. Instead we will then face the prospect of a 'tipping cascade' where the passing of one tipping point causes us to trip over subsequent tipping points. This calls for grown up risk management, which in turn distinctly calls for sharp thresholds to be built into our models' damage functions – even if we don't have the first clue as to how punitive to make them. As a gratuitous aside, the Keen et al paper notes that "the top 9 general economics journals have published 57 papers on climate change, out of a total of over 77,000 papers". We really haven't put the work in that we need to.

I would like to finish on a somewhat philosophical note. I take it as given that we need to act against climate change. The question then is, will we base our actions on our understanding, or on model output? The Institute's climate beliefs working group concluded that we have all the evidence we need to act – and no model was harmed in reaching that conclusion. We can read the work of the climate scientists and we can understand enough of it to apply to our own domain. We already understand extreme-risk thinking – that we tread a single path into the future, so path-dependency matters, as does paying up to avoid the things that can kill you. If we do tip into a new climate state then the models won't help us, because relationships will have changed, and we won't (initially) have any data to estimate them.

In short, we already understand what we need to do. I guess all we need now is the heart, and the courage, to act.

[95] *Future of the human climate niche*, Timothy Kohler and Timothy Lenton, PNAS, 2020, Xu et al estimate that over the next 50 years between 1 and 3 billion people will be "left outside the climate conditions that have served humanity well over the past 6,000 y"

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Phase down or phase-out | is there a difference?

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The discussion here relates to the winding down of fossil fuels. Arguably, the most high-profile use of the terms was in the concluding statement for COP26. The draft statement included the phrase "phase-out" in relation to the global use of coal. India pushed for, and was successful in, a change of words to "phase down" coal use. As an interesting aside, at COP27 India has pushed for agreement on the "phase down" of all fossil fuel use, which Saudi Arabia appears less keen on.

The two phrases relate to two different pathways, with the implication being that the paths converge on the same destination, such as 'net zero by 2050'. In this case there can only be any interest in comparing them if the nature of journey would be qualitatively different. Or, if the implication of convergence turned out not to be true. Let's explore...

We should first define our terms. In the absence of a commonly-held definition, we in Thinking Ahead suggest defininng 'phase out' to mean the progressive reduction over successive periods to the point where no further usage occurs. In contrast, 'phase down' will also mean a progressive reduction over successive periods, but to a level that is deemed acceptable to continue into the indefinite future. In other words, 'phase out' gets to net zero by 2050 by contributing absolute zero (annual) emissions from fossil fuels, while 'phase down' requires the simultaneous building up of carbon capture and storage (CCS) to a level that offsets the continuing 'phase down' emissions.

We can now consider the two scenarios introduced above. The first is that the down and the out pathways converge on net zero annual emissions by 2050. From the construction of this scenario there is no meaningful difference between the pathways in terms of their impact on the climate. Instead, the difference will be seen in the mix of energy types and, possibly, in the quantity of energy supplied. The phase out path means that the energy mix in 2050 will not contain any energy derived from the burning of coal, oil or gas. In turn, this would have big implications for certain sectors where electrification is less straightforward (eg shipping, trucking, flying, high-temperature manufacturing). The quantity of energy supplied in 2050 will directly depend on the rate of investment in new (non-carbon) energy generation between now and then.

The phase down path means that we will still be burning fossil fuels as part of our energy mix in 2050. Again, from the construction of this scenario the amount of fossil fuel (and, by extension, the total amount of energy) will depend on the rate of investment in, and the efficiency of, CCS. The amount of energy can be further boosted by also investing in non-carbon energy if there are sufficient funds. This path gives us greater scope to continue benefiting from the hard-to-electrify sectors.

The second scenario is that the pathways actually diverge. Phase out still gets us to zero absolute emissions in 2050, but it gives us the headache of finding substitutes for the hard-to-electrify services we currently enjoy. It could also result in a fall in the total amount of energy supplied, which would be an aberration in a historical context. This would imply some form of energy rationing, which is a difficult proposition for those of us in the global north to wrap our heads around.

The divergence, therefore, comes from the phase down path. We will either default on the phasing down (nobody likes energy rationing, so we keep on burning fossil fuels), and/or we will discover that CCS is more difficult, more expensive, or less efficient than we hoped – and therefore we will do less of it. In this scenario, 'phase down' does not get to net zero by 2050.

Why might CCS disappoint? First there is the technological angle. Every successful new technology takes a number of decades to mature. Solar electricity took 40 years to become price competitive with fossil fuels. CCS has only 25 years to show it can be successful, and to mature and scale. Second, there is the physics. Capturing carbon from the air, compressing it and pumping it underground takes energy[96]. Why dig up more natural ecosystems to find the materials, to build new energy generating capacity, to power CCS when it would be simpler, cheaper and more efficient to burn less fossil fuel instead? Third, there is the biology, or the human domination of natural ecosystems. It would be nice if the so-called 'nature-based solutions' could do the heavy lifting of carbon removal for us. Unfortunately, that ship has sailed. The atmosphere enjoyed 10,000 years of stability in the run up to the industrial revolution. The concentration of carbon dioxide didn't vary much from 280 parts per million (ppm). In 2022 the concentration passed 420ppm. In other words, while nature has done its best, it was not able to offset the light economic activity of 1bn people, let alone the heavy economic activity of 8bn people now. Tropical rainforests are transitioning from carbon sinks to sources, and permafrost has started to melt, releasing long-stored greenhouse gases. Against these considerations, how much confidence should we have in the effectiveness of CCS?

In this piece we have considered phase down vs phase out at the very highest level. A proper consideration would require a much longer piece and a breath-taking amount of complex detail. For me, however, the primary importance lies in the high-level abstract realm. The choice of phase down or phase out will reveal our underlying values and beliefs. It is, pretty much, an ideological choice. In the run up to COP26 Greta Thunberg wrote that "we now have to choose between saving the living planet or saving our unsustainable way of life"[97]. It is my argument that phase out is a choice to save the living planet, while phase down is an attempt to save our unsustainable way of life.

[96] Currently 2,000 kWhours per ton of CO2, according to James Dyke in *We Need to Stop Pretending we can Limit Global Warming to 1.5°C*, Byline Times, 6 July 2022
[97] *There are no real climate leaders yet – who will step up at Cop26?*, The Guardian, 21 Oct 2021

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To explore, or not to explore

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To explore or not to explore. This piece considers whether it is now time to stop exploring for new fossil fuel sources. Asset owners and managers are facing increasing pressure, from groups ranging from campaigners such as Make My Money Matter, to international organisations such as the United Nations, to commit to not financing new fossil fuel exploration. This position is backed up by the International Energy Agency (IEA) in their Net Zero by 2050 roadmap and most recently the International Institute for Sustainable Development (IISD) who stated that planned new oil and gas investments are "incompatible with a 1.5C Warming Limit".

Just to be clear there is a difference between 1) investing in existing fields (for maintenance for example), 2) continued development (that has already started but could take years to complete and start producing) and 3) new exploration. So far, the IEA Net Zero by 2050 scenario only states that the latter, new exploration, is not required. Given this activity is a small fraction of total oil and gas industry capital expenditure, and that new capital raisings are not specifically for exploration, there is a need to address whether there is a role for the investment industry in this debate.

Why would we continue to explore? The answer is to find cheaper, less destructive fossil fuels. Essentially this means exploring for cheap sources of gas so we could shut down dirtier coal and tar sands operations. Would we stop using the dirtier fuels, or would we end up burning both the old and new fuel? The possibility that we burn both is the argument for stopping new exploration. Absent a change in incentives (ie a new, higher carbon price) the world may end up with more greenhouse gas (GHG) emissions (and therefore higher temperatures) not less[98]. The Intergovernmental Panel on Climate Change (IPCC) have cautioned that existing fossil fuel infrastructure is "already sufficient to breach the 1.5C limit". Therefore, prudence or the precautionary principle, argues for no new exploration of fossil fuels, to ensure the best chance that humanity does not tip the climate.

Essentially, it is easier to prevent fossil fuels being burned if we do not know where they are, than trying to persuade owners of existing operations to strand their own assets, or persuading governments to introduce a high carbon price that makes those assets unprofitable. Beyond this headline statement is a host of difficult detail.

For example, banning new exploration might contribute to an energy supply and demand imbalance, and therefore increase the likelihood of a disorganised transition. Energy shortages can lead to a worse outcome for the climate. See, for example, the emergency substitution of gas with higher emitting coal due to the conflict in Ukraine. The underlying assumption appears to be that humanity has a right to as much energy as it needs and wants. However, unconstrained energy use and limiting temperature rise may be incompatible[99].

Another concern is that implementing a "no financing of new fossil fuel exploration" policy is problematic as most financing is to an issuer not a specific project. Moreover, 1.5C pathways are light on detail, particularly at the asset level, which also makes such a policy difficult to action. And sectoral pathways assume fossil fuel energy demand falls into line over time, which is unlikely at least in the near term.

All things considered, if we don't support such policies there is an implicit assumption that investors will act in a way that supports the transition instead of short-term financial gains. Historically, this has not been the case. Allowing additional exploration and development of lower cost fossil fuel sources may reduce the expected cost of the transition but it also increases the risk that the transition does not happen at all.

Given the high level of these thoughts, and the absence of 'exploration securities', is there a practical role for the investment industry here? We think there is. We would like to see a step-up in stewardship and engagement through which the industry communicates its desire for no new financing of fossil fuel exploration (thereby lowering stranding, systemic, non-transition and portfolio risks). This works on the supply side. At the same time, it is equally important to address demand. So, there is a new role for the investment industry in lobbying, advocating, and engaging for demand side constraints to reduce the likelihood of energy imbalances.

On balance, therefore, it seems wisest not to explore.

[98] Higher temperatures increase the risk of triggering climate tipping points as discussed in *Pay now or pay later?,* Thinking Ahead Institute 2022
[99] The idea of energy rationing, or constrained demand, is considered within another of our investment insights, *Phase down or phase-out | is there a difference?*

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How large would you like your climate risk to be?

CLICK HERE FOR ORIGINAL ARTICLE

While the title of this thought piece might appear a little strange ("as small as possible please!"), my original (more accurate) title was even stranger: "When it comes to damage functions, are you a quadratic or logistic person?" All will become clear, very soon.

In a companion thought piece, *Energy is the fundamental systemic risk* (#24 above), I suggest that our breaching of various planetary boundaries is proof that we are increasing systemic risk. In this piece, I aim to explore what might be the consequences of breaching planetary boundaries and triggering systemic risk. Specifically, I will focus on the carbon emissions boundary, because that is where most of the modelling is.

The phrase 'damage functions' is part of the jargon used within the modelling of climate risk. It refers, precisely, to our area of exploration in this piece. The damage function in a model relates the amount of predicted warming to an amount of predicted economic damage. The choice of damage function matters. They can be more, or less, aggressive. So, different models of climate risk will show a different amount of economic damage for the same amount of warming. It is therefore important to understand the damage function and choose one that corresponds with your climate beliefs.

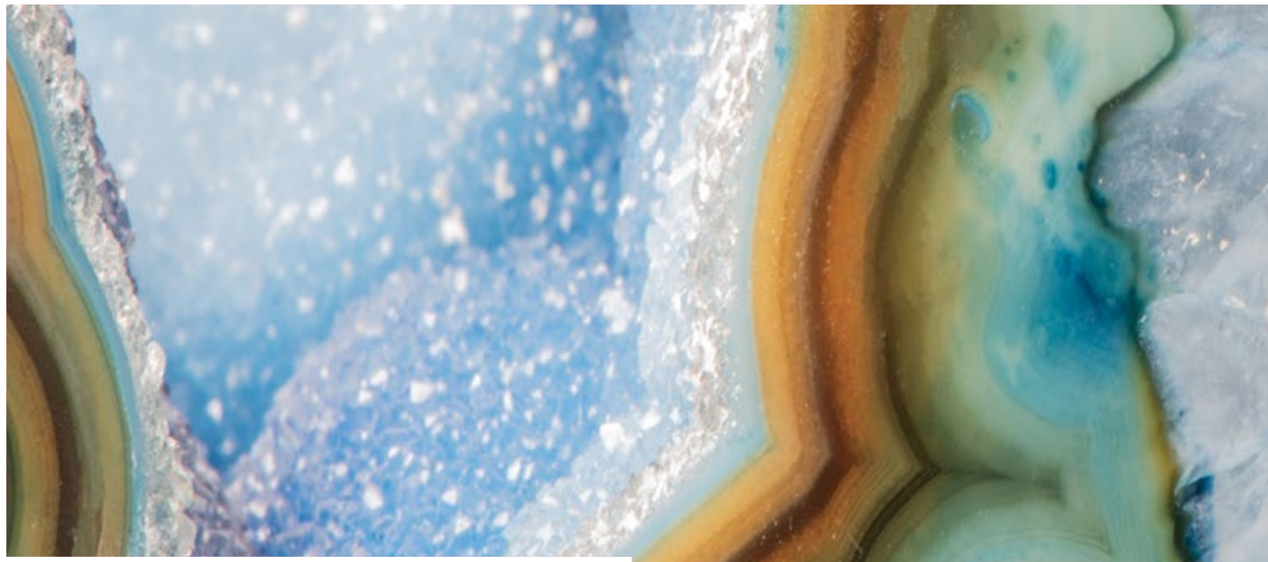
To illustrate this with examples, a really aggressive model (eg Burke et al 2015) would suggest a 23% loss of GDP at 4C of warming. A less aggressive model (eg Khan et al 2019) would suggest a 7% loss of GDP at 4.5C of warming. These answers are materially different, and we would expect different impacts on asset prices. However, both these models – and, in fact, the majority of models of climate risk – use what is known as a 'quadratic' damage function.

Our TAI paper Pay now or pay later? argued that the results above were substantial underestimates. And in a previous thought piece, Climate tipping points change everything (#39 above), I argued that the wrong baseline was being used. Instead, I suggested a better baseline was to consider a 100% loss of GDP as currently measured due to unmanaged climate change and to work back from there.

Now seems a good time to push harder on that idea. It is clear to me at least, that there is some level of warming at which all economic activity ceases. Sometime before that, it would appear reasonable to assert that humans will lose interest in measuring GDP or other conventional measures of growth because survival is more pressing. At what temperature might this occur? In the appendix of our *Pay now or pay later paper?* we listed physical damage as set out by the IPCC[100]. Among other effects, a temperature rise between 2.5 and 4.5C is expected to lead to the 'widespread death of trees' and 'reduced provision of ecosystem services'. I will leave you to decide the level of warming associated with a 100% loss of GDP – but it could be as low as 5C.

The question now is what shape of damage function should we draw between where we are[101] and a 100% loss of GDP. It could be linear, but I would suggest a 'logistic' function (sigmoidal, or S-curve) is more realistic. Damage will accumulate slowly in the near term and then accelerate. How quickly it accelerates will depend on the temperature limit you chose above. But for any reasonable range of temperature limits, a logistic damage function will suggest a loss of GDP that is a multiple of the damage suggested by a quadratic function. In turn, this would suggest that the potential risk to asset prices is way, way higher than any modelling results you have seen to date.

So, what do you believe about climate? Do you believe the physical damage it will cause will rise at a faster rate (non-linear) as the temperature rises? Do you believe that indoor work will be adversely affected, as well as outdoor work[102]? Do you believe that climate tipping points exist, and some could be triggered at low levels of warming? The more strongly you believe these, and similar aspects, the more I would suggest you consider a logistic damage function. Forewarned is forearmed.



[100] From the *IPCC WGII Sixth Assessment Report's Technical Summary*
[101] Over the decade to 2020, annual climate damage was estimated to be around 0.2% of world GDP (*Equity Investors Must Pay More Attention to Climate Change Physical Risk*, IMF blog, May 29, 2020). This level of damage was associated with a level of warming rising from around +1C to +1.1C. A Grantham Institute policy publication dated 30 May 2022 estimated climate damage in the UK at 1.1% of GDP (What will climate change cost the UK? Risks, impacts and mitigation for the net-zero transition)
[102] Many models, and their damage functions, assume that 85-90% of GDP will be unaffected by warming because the activities are performed indoors

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Pay now or pay later?

CLICK HERE FOR ORIGINAL ARTICLE

Why the investment industry has a responsibility to address the impacts of climate change sooner rather than later to best protect the interests of investors and their beneficiaries.

The climate crisis is looming very large at present both at a personal level and in the investment industry. There has never been more focus on its ramifications and yet it seems the industry is not acting swiftly or definitively enough to address them.

In recent years there has been a proliferation of net-zero commitments. For example, the Net Zero Asset Managers Initiative (NZAMI) has 273 signatories representing US$61.3 trillion in assets under management. However, these commitments do not yet represent the majority of the industry and implementation of required changes to meet these commitments is proving difficult as well as slow.

There are many reasons why but fundamentally transitioning the economy and preserving the current climate will require change at every level, government, corporate, investment and individual. Also, change is hard and goes hand in hand with uncertainty, which humans generally don't like.

There is also a question about how much responsibility the investment industry has in aiding the transition to a lower-carbon economy and improving the climate-change trajectory. Thinking Ahead has done research into this space and found that the industry is responsible for 25% of all emissions. An indication that the industry should be motivated to act.

In our most recent paper, Pay now or pay later?, we translate the economic costs and physical impact risks of climate change into the effect on financial assets in the long-term. By doing this it is possible to quantify the relative cost of transitioning the economy at slower or faster rates.

In this paper we observe that risk increases rapidly as temperature rises. This is concerning given Climate Action Tracker's most optimistic scenario, that we are heading for 1.8C warming by 2100. And that by continuing in a business-as-usual manner we could see a temperature rise of between 2.7C and 3.6C. According to the IPCC, at a temperature rise of 2.7C we could experience simultaneous crop failures in breadbasket regions across the world. This would have huge ramifications for feeding humans and livestock globally and for the production of biofuels. These are just a few of many predicted physical impacts at this temperature.

Moreover, this temperature rise prediction could be considered conservative. Historically the extent and impact of climate change has been underestimated by scientists who will often focus on the outcomes where there is the greatest confidence, discounting uncertainty. This is in part due to vested interests and political lobbying which has significantly slowed down the pace of action during the last 30-40 years. This is a considerable issue as the decisions made now will determine what long-term outcomes are possible.

What is becoming clear is that the investment industry, with huge long-term financial obligations to billions of people, should – on a number of levels – be motivated towards a more rapid transition of the economy to net-zero carbon. Given the alternative, which is a climate transition to a state that scientists have deemed unsafe.

At only 1.2C warming we are already getting a taste of what this unsafe world might look like. In September (2022) we saw Hurricane Ian sweep through Florida in the US. This summer Europe was marred by deadly heatwaves and fires. In Pakistan 4 million acres of cropland have been destroyed in floods and China is in the midst of a record-breaking drought. In each of these extreme weather events we have seen a loss of human life and a significant impact on food distribution and production. What might a 3.6C warmed world look like? We cannot know for sure but if we also consider climate tipping points we are entering into a dangerous era.

There is an added motivation for the investment industry to move quickly. According to our research, transitioning the economy to a well below 2C scenario, might see a loss of 15% of existing financial assets. This loss could be, at least partly, offset by the positive benefits of new primary investment. At the very least, providers of this financial capital could expect to see future returns after the initial drawdown. For the economy there could be an immediate boost from spending on wages and capital goods and associated cost reductions and productivity boosts. If we also attempt to steward a highly co-ordinated and orderly-as-possible transition, transition costs could be further mitigated.

However, if the industry continues in a business-as-usual way, there could be a 50-60% downside to existing financial assets, taking into account climate tipping points and flaws in existing climate modelling. This is aligned with the path that we are currently on. A strong signal that the industry needs to increase its efforts.

Transitioning the economy will incur costs, that is a given. How much will depend on how quickly the global economic system can adapt to address climate change. The investment industry, as an influential part of this system, will realise the added risks and costs of delayed action. As an adaptive and competitive industry, it would be surprising if key players don't recognise the overall benefit of addressing the impacts of climate change sooner rather than later.

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The Thinking Ahead Institute (TAI) is a not-for-profit research and innovation network motivated to influence the investment industry for the good of savers worldwide and to mobilise capital for a sustainable future. Since it's establishment in 2015, over 90 investment organisations have collaborated to bring this vision to light through designing fit-for-purpose investment strategies; working towards better organisational effectiveness; and strengthening stakeholder legitimacy.

Led by Marisa Hall, Tim Hodgson and Roger Urwin, the Thinking Ahead Institute connects our members from around the investment world to harness the power of collective thought leadership and develop innovative solutions for the investment industry.

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