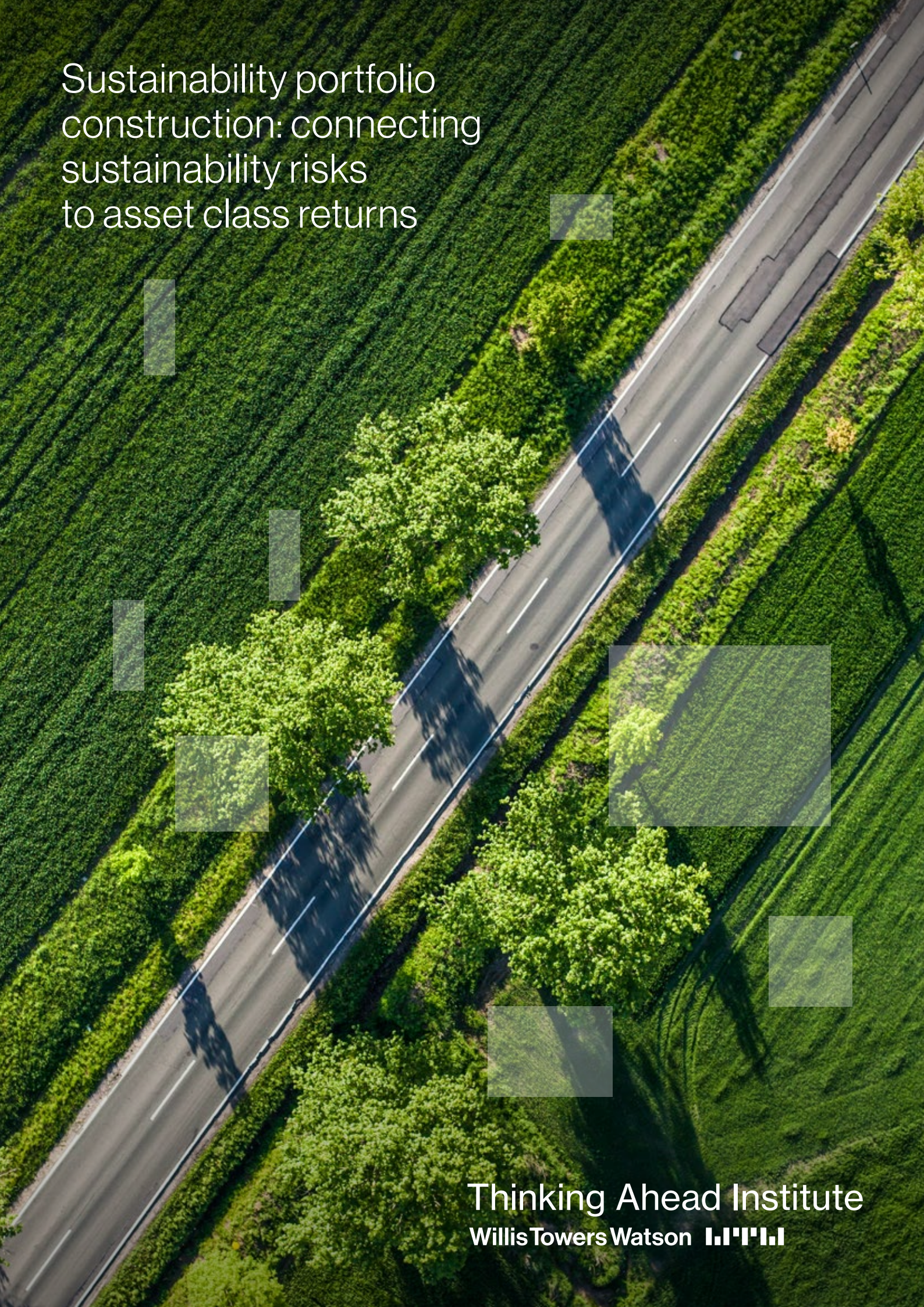
Sustainability portfolio construction: connecting sustainability risks to asset class returns



Thinking Ahead Institute

Willis Towers Watson

Sustainability portfolio construction: connecting sustainability risks to asset class returns

Contents

Sustainability portfolio construction working group

This document has been written by members of Willis Towers Watson's Asset Research Team and the Thinking Ahead Group 2.0 (Roger Urwin, Tim Hodgson, Marisa Hall), using contributions from the Thinking Ahead Institute's sustainability portfolio construction working group. The authors are very grateful to the members of the working group for their input and guidance but stress that the authors alone are responsible for any errors of omission or commission in this paper.

While the key objective of the group is to deliver to Thinking Ahead Institute members a series of publications that form a holistic framework for practically implementing sustainable investing, a secondary objective is to positively influence the investment industry outside the membership. We hope this paper serves both purposes.

The members of this working group are as follows:

- Adrian Trollor, BT Financial Group
- Peter Brackett, State Street Global Advisors
- Herschel Pant, AXA Investment Managers
- Martina Macpherson, S&P Global Ratings
- Per Lekander, Lansdowne Partners LLP
- Lucy Thomas, Willis Towers Watson

Introduction

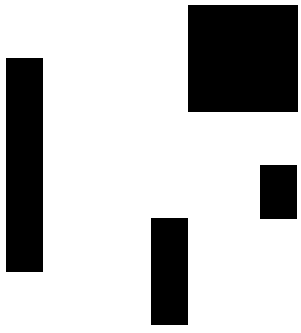
Over the last few years, there has been a growing number of voices which have stressed the importance of incorporating sustainability into the investment process. In 2014, the UK Law Commission recommended that both trustees and their financial advisers "bear in mind that both ESG and ethical factors may, in any given case, be material to the performance of an investment".[1] The UN PRI in its jointly published 2015 report on fiduciary duty in the 21st century noted that "failure to consider long-term investment value drivers, which include environmental, social and governance issues in investment practice, is a failure of fiduciary duty"[2]. Proponents like these have resulted in the subject of sustainability gaining greater traction with investors. According to the Global Sustainable Investment Alliance's (GSIA) 2016 review, there is now US $22.89 trillion of assets professionally managed under responsible investment strategies, representing about 26% of assets managed globally.

Our aim is to create a framework that could sew all the pieces into a coherent patchwork. That is, provide a set of tools that investors could take and adapt to their own mission.

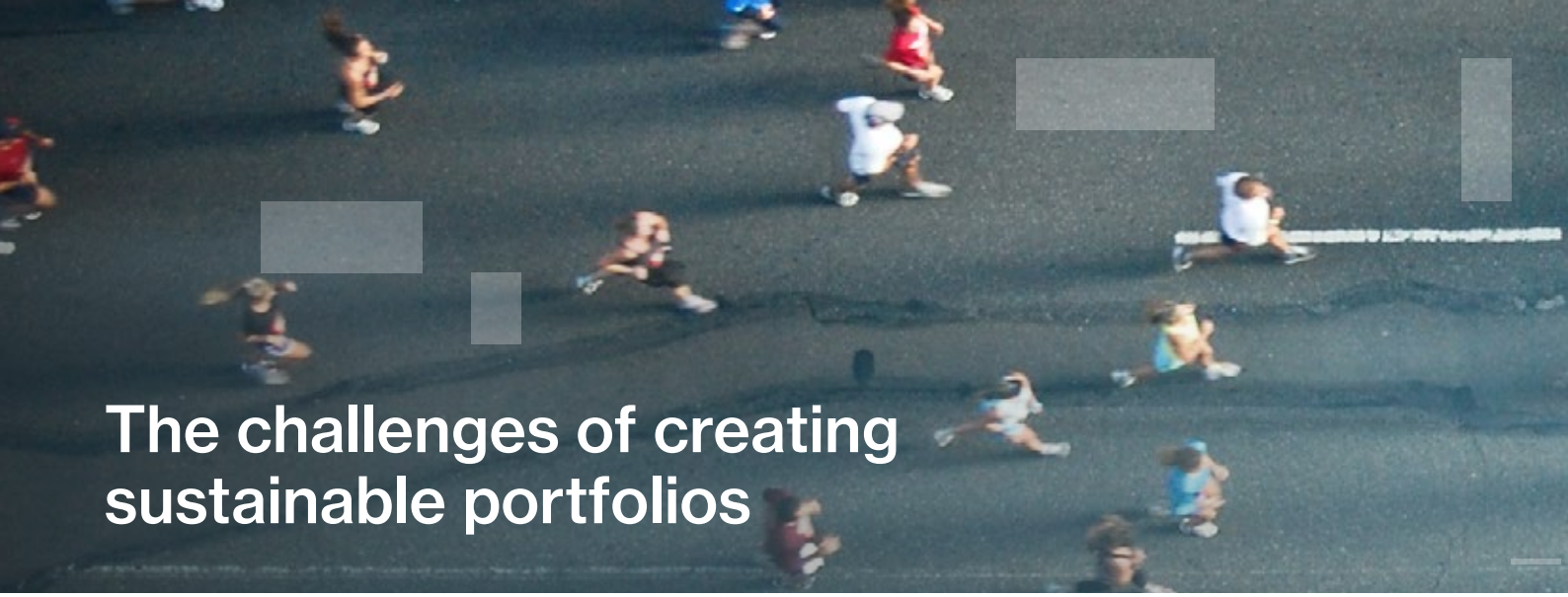
So why, you may ask, do we need another paper on sustainable investing? We fully acknowledge that great work has been done in the area of sustainability by academics and practitioners alike. While this has produced a great many useful insights, many of which are being implemented today in investors' portfolios, there appears to be a noticeable gap in the literature. The work so far is insightful, but fragmented, and we know from our conversations with investors that they do not feel comfortable that sustainability is fully embedded – and measured – in their investment processes. They may, for instance, have developed a set of sustainability beliefs but struggle – for time, resources and other reasons – to implement these beliefs. Or they may have identified investments that they view as sustainable, but cannot quantify how exactly these investments impact the portfolio.

We want to offer investors a holistic framework which allows them to seamlessly integrate financial and extra-financial (like ESG) metrics into all aspects of portfolio management, from risk management, through portfolio construction, all the way down to security analysis. We are keenly aware that stewards of institutional money are not in the business of re-inventing the wheel. So the framework would consist of a set of modular tools, which dovetail with – rather than replace – existing strategic asset allocation processes.

This paper focuses on the middle stages of the process – risk management and portfolio construction – which are the stages investors tend to struggle to apply sustainability to the most. We set out a new three-step framework to help investors quantify the impact of sustainability risks, identified through our analysis of megatrends, on asset returns. This resonates well with our mantra 'what gets measured, gets managed' and allows for investors' sustainability beliefs on the significance of these trends to manifest themselves into portfolio positions. We do this analysis by moving beyond looking at the impact of megatrends on economic conditions – which is a useful initial analytical step – and go deeper by undertaking analysis at an industry level, to determine how profit pools are shifting and capital is allocated. Our framework, we hope, deepens our collective understanding of the long-term generators of (and detractors from) sustainable asset returns.



[1] http://www.lawcom.gov.uk/app/uploads/2015/03/lc350_fiduciary_duties.pdf
[2] https://www.unpri.org/download_report/6131



The challenges of creating sustainable portfolios

Many long-term investors understand the problem they face in moving towards more sustainable portfolios. They know that basing their investment decisions on historical information alone is sub-optimal, because the relationships and correlations of the past may be wildly different in the future. Moreover, financial asset prices are arguably driven by shorter term factors and may not reflect the influence of long-term change.

The problem is what to do about it. That is, how can they create a truly sustainable portfolio and how can they be sure they have succeeded?

A good number of institutional asset owners have developed a set of sustainability beliefs and some have excluded or selected securities based on their ESG characteristics. But integrating sustainability metrics into portfolio management, right down the investment value chain is something we believe has eluded asset owners to date.

While institutional investors have differing taxonomies and cultural challenges, their key decision-making issues tend to be similar, whatever their size and wherever they are based.

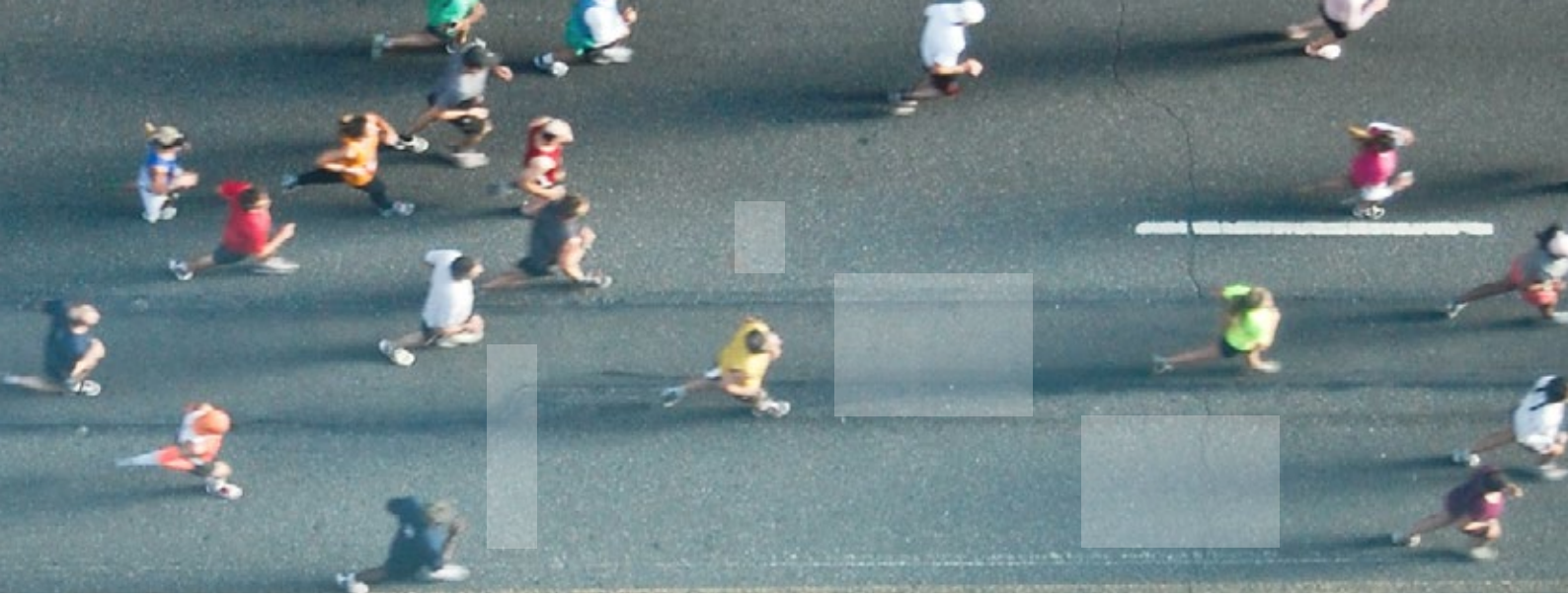
From conversations with institutional investors, what many of them seek is a framework and a set of tools that integrate sustainability risks across all the key areas of investment decision-making. Applying sustainability to just some of the process would seem, after all, to miss the point.

It ought to be possible to do this. While institutional investors have differing taxonomies and cultural challenges, their key decision-making issues tend to be similar, whatever their size and wherever they are based.

Figure 1. **Integrating sustainability metrics into portfolio management:** Sustainable investing applies throughout the investment value chain

Comments:

- **Articulate mission** – choose to (1) manage reputational and regulatory risk; (2) account for all material sustainability factors; and/or (3) address real societal needs.
- **Develop a risk management process** with a long-term horizon, which can also quantify short-term implications. In practice, link sustainability-related trends to long-term risk-return expectations and stress tests.
- **Portfolio construction** accounts for material sustainable risks and opportunities. Define benchmarks to measure the success of sustainable strategies over the long term. Execute through beta and/or alpha.
- **Better implementation and risk monitoring** through active ownership, alignment of financial interests towards the long term, and integrating financial and ESG factors.



Definitional dilemmas

Despite the meteoric rise in the amount of capital allocated to sustainable investing, many investors find sustainable investing difficult to define which is unsurprising given the large number of closely related terms in this space which are used interchangeably and the mottled history of sustainable investment practice over the last several decades.

It is perhaps foolhardy to assume that there can a set of universally agreed definitions. In this paper, however, we will try to be disciplined to minimise definitional ambiguity. We propose the below sustainability taxonomy and will attempt to stick to it as closely as possible.

Figure 2. **Glossary of sustainability terms**

Sustainability	The principle of making sure that short-term actions don't compromise long-term outcomes. Integrating the realities of the present with the possibilities of the future.
Responsible investing (RI)	Responsible investing is investing in a manner consistent with broader values of fiduciary responsibility; this includes considerations like 'do no harm', preserve reputation, uphold stakeholder wishes. Such considerations are integrated with the pure financial values. RI is often considered through the specific UN-sponsored Principles of Responsible Investing (PRI).
Sustainable investing (SI)	Sustainable investing is long-term investing that is efficient and intergenerationally fair to beneficiaries and stakeholders. It combines the integrated ESG and active ownership elements of RI with the concepts of efficient long-term investing and intergenerational fairness. RI = integrated ESG + active ownership SI = RI + long-term investing + intergenerational fairness
Megatrends	An integrated system of real-world forces resulting in multidimensional structural changes across society, technology, economics, environment and politics (STEEP). Identified through our analysis of megatrends, we define STEEP-related threats to sustainable investing as '**sustainability risks**'.
ESG – environmental, social and corporate governance factors	Environmental, social and corporate governance issues are the key extra-financial factors that influence corporate performance over time; such factors can be responsible for both risks and costs being born internally or externally transferred from one entity to another (externalities) Integrated ESG is the systematic and explicit inclusion (by investment managers) of environmental, social and governance factors into financial analysis.
Extra-financial factors	Factors that lie outside the usual spectrum of financial variables appearing in financial statements that are used for investment decision-taking that, while difficult to measure and codify, can influence financial performance over time; ESG factors are the principal extra-financial factors.
Active ownership/ stewardship strategies	The voting of company shares and/or engagement with corporate managers or Boards in dialogue on key strategic issues including ESG, pursued with the goal of reducing risk and/or improving performance.

From theory to framework

Sustainability risks: understanding the impact of megatrends

Sustainability quite clearly encompasses ESG issues. But we think it is important to think of it as a broader concept. It is a way of understanding the key structural drivers of economies, industries and capital markets, and therefore of investor portfolios. Then it is about transforming portfolios so they are resilient to any related risks.

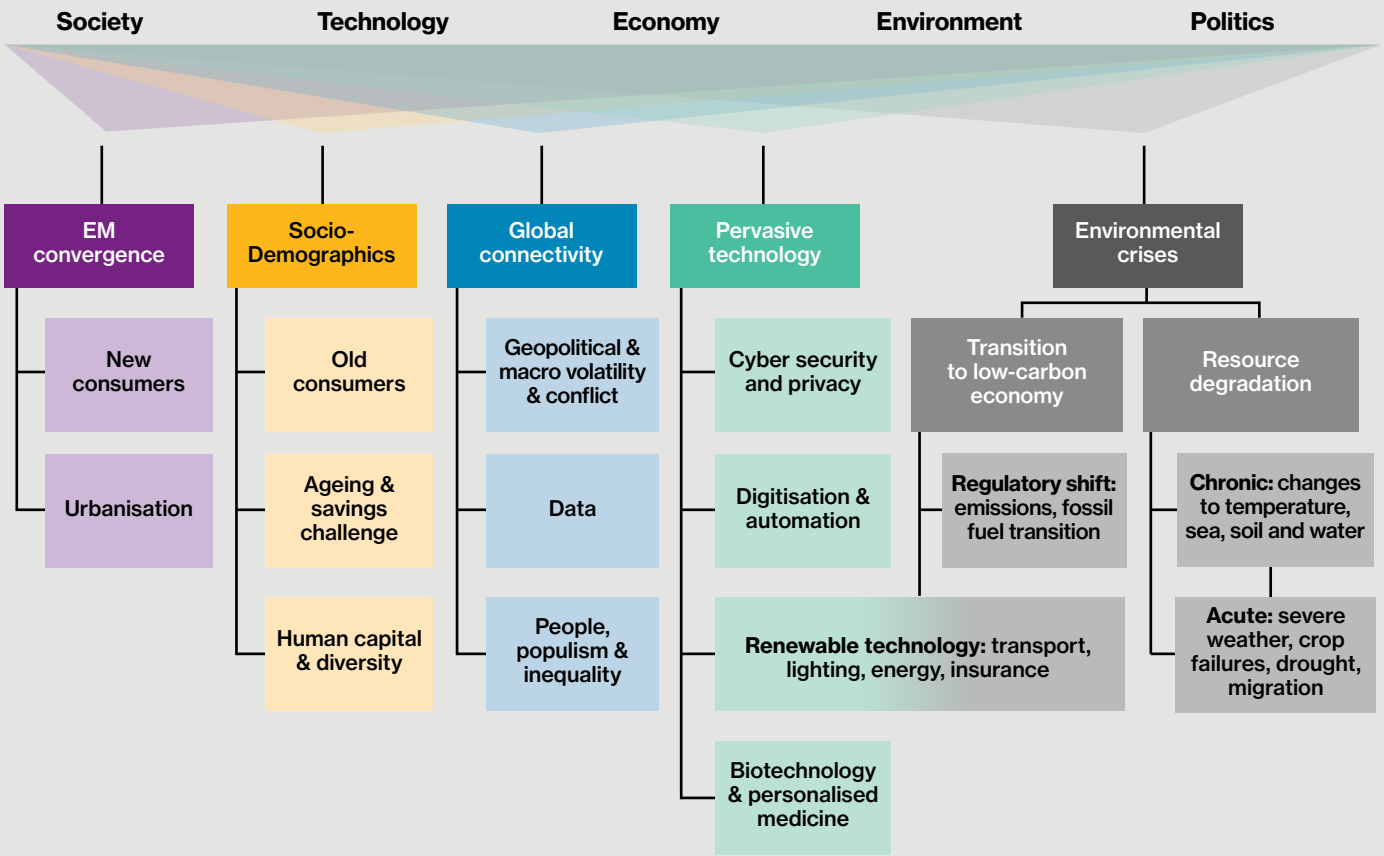
We must be able to assess material risks and opportunities. So what do institutional investors need in order to do this? Any new framework must be able to sit alongside processes which already exist. It must be complementary to existing structures, so as to minimise disruption and cost. It must be able to convert sustainability risks into quantifiable risk-adjusted returns.

To create a truly sustainable investment process requires an improved understanding of the directional impacts of megatrends.

Most institutions share a common belief that megatrend dynamics will result in multidimensional transformations across society, technology, economics, environment and politics (STEEP). We would also strongly encourage this thinking about megatrends to be framed within the context of an integrated system of real-world powerful forces altering the structure of economies, industries and global capital markets.

Below, we briefly highlight our categorisation of material STEEP-related megatrends. Importantly, these megatrends can all be defined by intuitive and practical key economic indicators. As such the impacts of these megatrends are quantifiable in terms of how they change economic

Figure 3. **From material megatrends to sustainability risk scenarios**



outcomes, industry outcomes, and their societal and environmental impacts. Moreover, these impacts can be estimated at a reasonably granular level, for example by region and industry. They can also be estimated over different time horizons, for example five years and ten years. To the extent that megatrends change economic and/or global industry conditions – and these changes are not priced-in to financial assets – they will impact asset prices and returns.

Importantly, the material megatrends and sub-trends can also be clearly linked to the definitions of the UN's Sustainable Development Goals (see appendix). Therefore, the consequences of any material megatrend can be linked to quantifiable outcomes for society and the economy, for example, changes in megawatt hours of sustainable energy-production, CO2 emissions, tonnes of food produced, persons provided with healthcare and so on.

Going deeper

Our initial inclination was to analyse the impact of ESG on economic conditions, and use that to infer what the most likely changes are for asset prices. This is a useful initial analytical step but it is not the whole picture. To quantify the impact on asset returns it is essential for sustainability analysis to be undertaken at an industry level, to determine how profit pools are shifting and capital is being allocated and this is a central element of our new three-step framework.

Outlining our three-step framework

Our new three-step framework helps investors quantify the impact of sustainability risks on asset returns and can be summarised as follows:

Step 1 – go down to industry level to analyse the potential impact of sustainability risks on profit pools.

Step 2 – we use our 'what's priced-in' framework to derive the fundamental conditions currently discounted in market prices. By comparing how our sustainable view of the world differs from that implied by market pricing, we can better understand the impact on asset class returns.

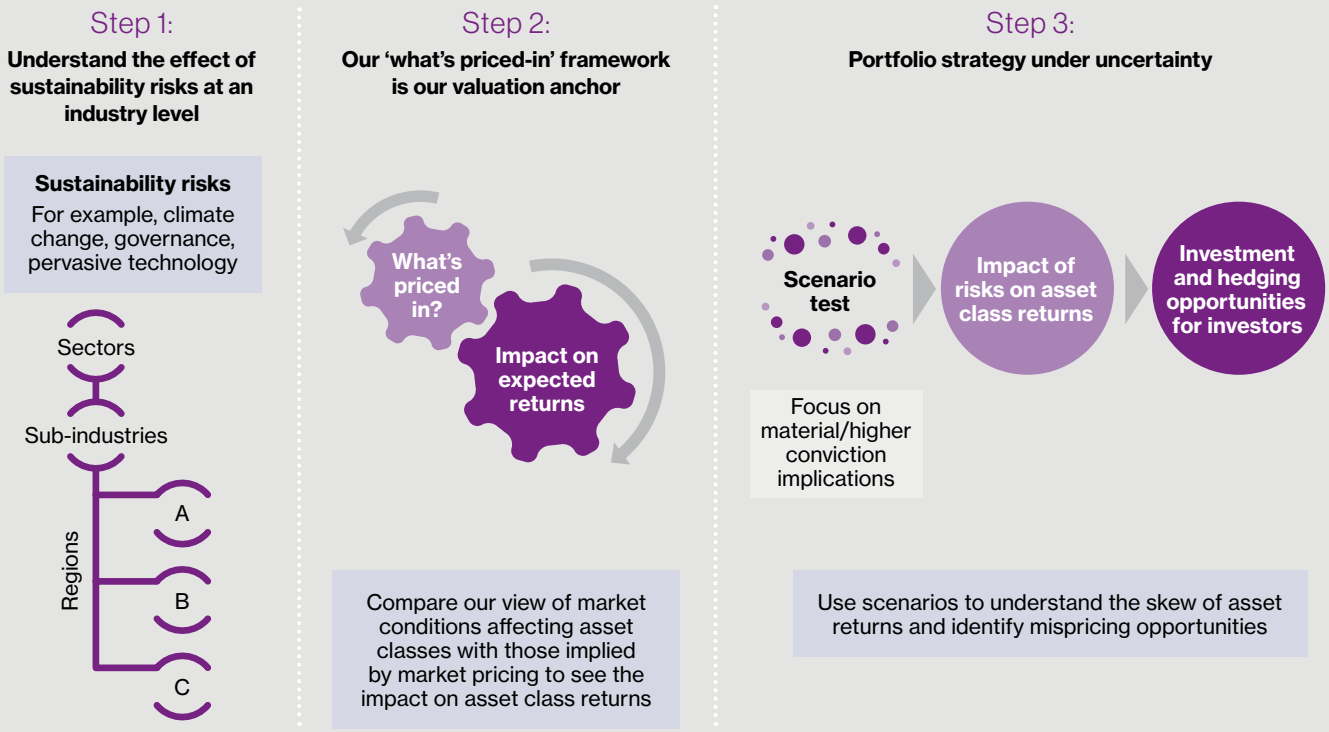
Step 3 – we then use scenarios to manage material uncertainty, sensitivity-test the impact of assumed sustainability risks and build a picture of the likely skew of asset returns. We are more interested in the full distribution than the most likely outcome and we use this to then identify mis-pricing opportunities.

This is how it works in detail.

Step 1: understanding sustainability risks at an industry level reveals the most likely and important shifts

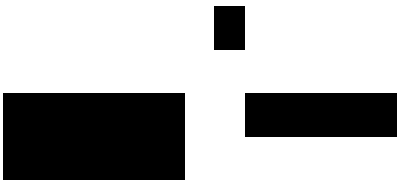
Our industry framework disaggregates the public and private corporate world into key sectors and sub-industries. We choose an industry and regional breakdown which goes deep enough to disaggregate the primary structural drivers of demand and profit pools, but stays sufficiently high-level to provide useful signals from a top-down perspective. The total framework allows investors to seamlessly integrate the same financial, sustainability and ESG metrics into all aspects of portfolio management, i.e. from asset assumptions and risk management, through portfolio construction, all the way down to security analysis.

Figure 4. **Our framework: identify the impact of sustainability risks on asset class returns**



By profit pools we refer to the economic added value an industry creates. This value is generated by the providers of labour and capital and accrues to them in the form of wages and profits respectively. From a capital-provider's perspective, profit pools shift because: 1) the ability of the sector or industry to generate economic value-add may increase or decline, or migrate to another industry; 2) the share of the value-add taken by labour may change; and 3) the composition of the profit pool may shift between existing businesses and/or new entrants. Analysing the primary structural drivers of change at the industry level and therefore understanding sustainability risks, will allow us to make more meaningful statements about the shifts in value-add and how profit pools might change and migrate between providers of capital.

To the extent that profit pools change on a country basis, for example, causing changes to a country's competitiveness, allocation of public capital or balance of payments, we can link that to sovereign as well as corporate outcomes and therefore make assumptions for credit returns. In this context, we can produce a heatmap (such as in *Figure 5*) to link sustainability-related risks and opportunities to long-term industry outcomes.



Step 2: our 'what's priced-in' framework is our valuation anchor

This interaction of understanding important sustainability risks at an industry level, in combination with existing economic theory, allows us to take the first step of quantifying the most likely and important changes in asset prices.

Our 'what's priced-in' framework, typically used to assess the cyclical economic conditions discounted by asset prices, allows us to do this. Almost all financial assets provide access to a stream of cashflows, which can be discounted back at some rate to give a present value or price. By setting the present value equal to the current asset price and reversing the equation, we can derive the stream of cashflow and fundamental conditions currently discounted in the market price. By comparing these conditions with our own views, we can make meaningful and quantifiable statements about how our view of the world materially differs from that implied by market pricing.

Specifically, we attempt to model the industry-level return on invested capital (ROIC) embedded in market pricing. A corporate's ROIC reflects its ability to transform capital investment into profit and is therefore a function of revenue, profit margins (or costs) and prior capital investment. Armed with an understanding of how profit pools are shifting in size/composition in response to sustainability risks drivers we can contrast our own view of the evolution of ROIC with that implied in market pricing and, in a systematic way, extract the implied impact on expected returns.

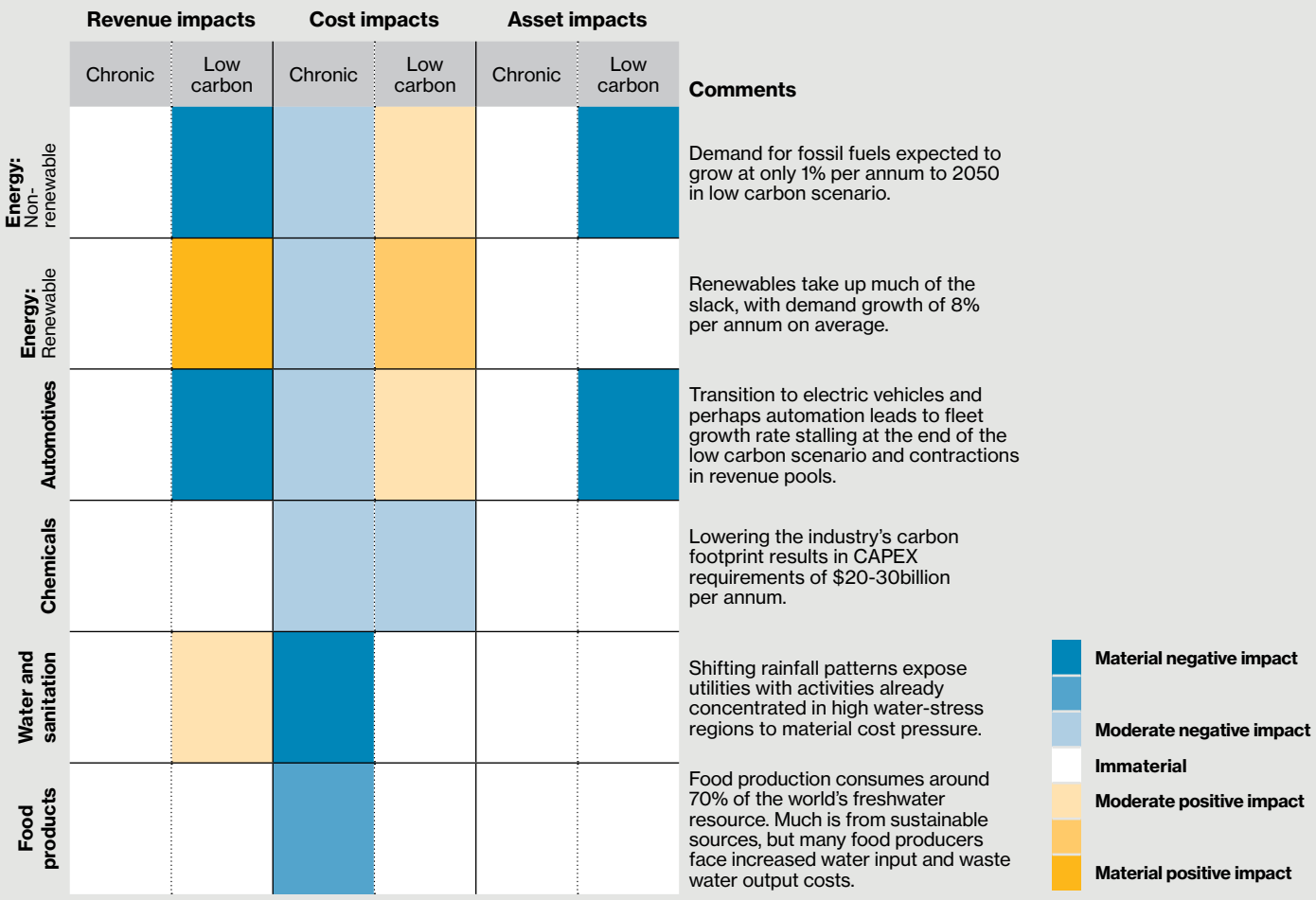
Step 3: portfolio strategy under uncertainty

We are less interested in the 'most likely' or modal impact of sustainability risks. This will always struggle against a credibility/conviction problem given the uncertainties of the judgements at play. More important is sensitivity-testing the impact of assumed shifts due to sustainability risks and building a picture of the likely skew of asset returns. To do this, we use scenarios – either a small number of discrete scenarios or an assessment of the range of outcomes – to build an intuitive picture of the return distribution.

We cannot hope to capture all of the impacts of sustainability analysis. Instead we focus on the more obvious changes and higher conviction implications. As a consequence we will miss some implications which may prove to be significant.

Ultimately, what we are seeking to do is broadly identify the size of the impact of sustainability risks on asset returns. Once we find a significant mispricing and have clear reasons as to why it exists, investors can determine the best implementation options to take advantage of an opportunity or hedge a risk. We seek to be approximately right rather than precisely wrong. This recognises that our goal is to gain an understanding of the material opportunities and risks for portfolios from sustainability analysis, given starting market prices.

Figure 5. **Climate-related industry impacts**



Source: Willis Towers Watson, UN PRI

Case study:
Linking climate change to portfolios

Let's now put the framework into action, showing how it can be used to understand and quantify a single sustainability risk – climate change.

In this section we briefly highlight how the framework can be used to understand and quantify climate-related risks, opportunities and financial returns. This is topical since the Task Force on Climate-related Financial Disclosures issued its recommendations to the Financial Stability Board. The recommendations are that voluntary, consistent, financial disclosures 'will help ensure that climate-related financial issues are routinely considered in business and investment decisions.'

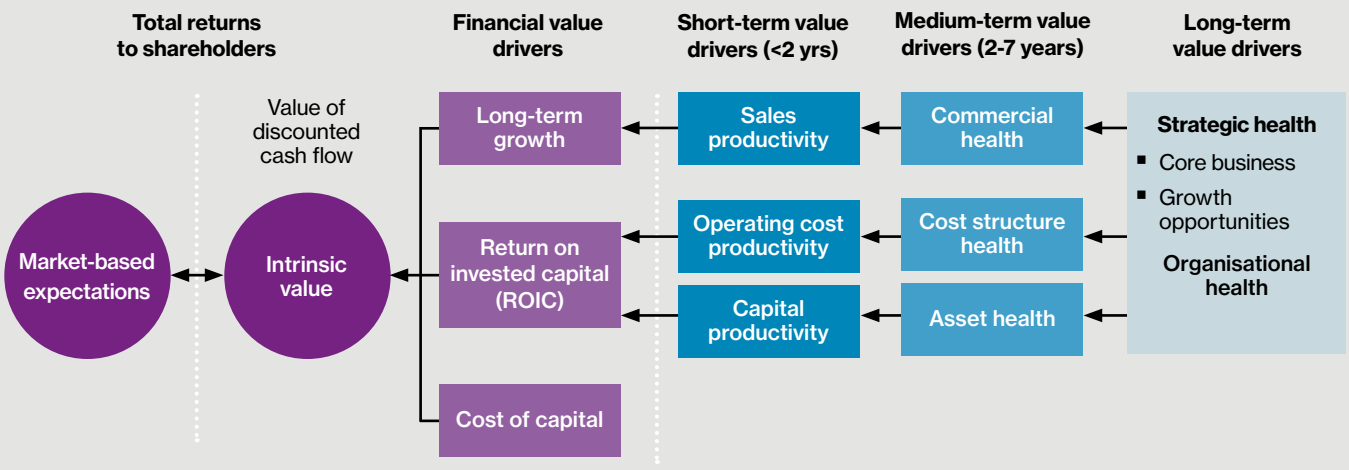
The impact of climate change on investors can be considered to fall into two broad categories: physical risks and transition (to a low-carbon economy) risks.

Physical risks

Physical risks can be chronic in nature, as certain events become more common and costlier. Examples include higher temperatures, rising sea levels or coastal erosion. Or, they can be more acute risks such as extreme weather events, which damage property and disrupt productive capacity.

The non-linearity and modelling uncertainty of physical risks, coupled with the dire possible consequences, creates significant issues for investors with multi-decade horizons. Recent research has combined macroeconomic climate models with a discounted cashflow approach to asset valuation to estimate, under different climate change scenarios, the financial costs of climate change by 2100. The estimates, based on private sector discount rates and three degrees celsius of warming, range from a largely manageable cost of $2 trillion (or 2.5% of global GDP) to a catastrophic sum. The majority of losses are expected beyond 2050, which is beyond the horizon of a substantial number of investors.

Figure 6. **The linkages between sustainability trends, economies, industry economic value and total returns to shareholders**



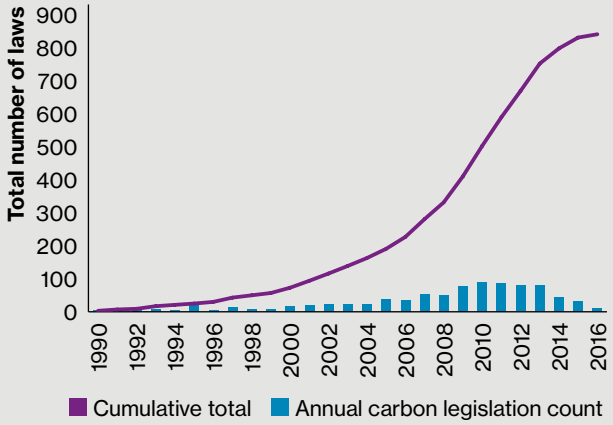
Source: McKinsey & Company, Willis Towers Watson

Figure 7. **A wide range of long term expected losses from climate change are justifiable**

2015 USD	3 degrees Celsius	5 degrees Celsius	6 degrees Celsius
Present value based on private sector discount rates			
Expected loss	$2 trillion 3% GDP	$7 trillion 9% GDP	$14 trillion 18% GDP
Present value based on public sector discount rates			
Expected loss	$8 trillion 10% GDP	$43 trillion 54% GDP	$70 trillion 88% GDP

Source: Economist Intelligence Unit, *The Cost of Inaction*, 2015

Figure 8. **Carbon legislation has been significant; focus is shifting to implementation**



Source: Grantham Institute

Faced with such a wide range of possible outcomes over such a long time-horizon, how should investors react? Such a wide range could result in inertia (rabbit in headlights). This is understandable and it will mean that investors' portfolio do not shift much, and the returns will be what they will be. It might be reasonable for investors to have small allocations to new, successful companies in their portfolio, but also have some companies with large weights which see dramatic price falls as some of their assets are stranded. The alternative is to deliberately re-position the portfolio now and raise the weights of likely future winners, and cut the weights of likely future losers – this can only be done with strong and well developed beliefs. Even then beliefs can be wrong and so there will remain an ongoing requirement for investors to manage the risks within the portfolio.

Transitional risks

In response to these physical risks, regulation, technology, changes in public opinion and customer preferences are shifting. Greater global regulation – in particular on emission reductions – looks set to be a key feature of the investing landscape. New technologies and novel usage of old technologies are also part of the response.

The implications and scale of physical risks may be very long-term and uncertain. However, changes in regulation and technology, are more knowable and are occurring over shorter time-horizons. However, this time horizon is still long enough to challenge standard market discounting mechanisms.

Legislative and regulatory change is catalysing significant technological change. However, identifying the technology is one thing, isolating the winners and losers across and between industries and asset classes is another. As discussed, we think tracking how the economic value added – or the profit pool – of a particular industry is shifting is an important step. By assessing how regulation, low-carbon technologies, customer preferences and so on are shifting, we can start to make meaningful statements on the impacts on future returns.

Conclusion

It is tempting to make sweeping conclusions when it comes to determining the impact of sustainability risks – such as climate change, wealth and income inequality, pervasive technology, dysfunctional governance – on expected returns.

But such conclusions lack credibility and objectivity and, therefore, struggle to support meaningful action. There is no choice, in our opinion, but to think in detail about the socio-political, environmental, economy and industry implications of a particular trend, with an eye to extracting the most likely and important implications for asset prices.

Investors then need a robust mechanism to turn those implications into quantifiable and testable asset-class level expected returns. And it is crucial that this mechanism accounts for current asset pricing because it may, or may not, discount sustainable conditions.

The framework set out here, in effect a modular toolkit, should be sufficiently flexible to be lifted into any portfolio. It enables granular analysis of the economic and industrial impact of sustainability risks, which is critical to understanding and measuring them.

Our framework, we hope, deepens the understanding of the long-term generators of (and detractors from) sustainable asset returns.

As ever, we invite your thoughts on this paper.

Appendix

Figure 8. **The United Nations Sustainable Development Goals**

Source: www.globalgoals.org

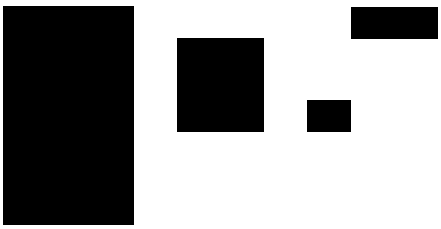


Figure 9. **Mapping megatrends and sub-trends to SDG impacts**

Megatrend	Micro-trend	SDG	Description of SDG Link	Primary Impact: Economy and/or Industry
EM Convergence	**New consumers**	SDG 1 Poverty, SDG 12 Sustainable consumption and production	Implications of migration of large numbers of people in the emerging world up the income pyramid	Country economy and industry
	Urbanisation	SDG 9 Industrialisation and infrastructure, SDG 11 Cities	Investigates the pace, scale and implications of an increased share of global populations living in cities	Country and local economy
Socio-demographics	**Old consumers**			Industry
	Savings challenge			Country economy
	Human capital and diversity	SDG 4 Education, SDG 5 Gender equality	Investment in education and training, reforms to improve labour-mobility, female labour participation	Country economy and industry governance
Global connectivity	**Geopolitical and macro volatility and conflict**	SDG 8: Economic growth and employment, SDG 12 Sustainable consumption and production, SDG 16 Inclusive and peaceful societies, SDG 17	Global trade, financial flows and productive capacity in economies, resource efficiency, culture and values including rule of law, corruption and bureaucracy	Country economy
	Data	SDG 9 Innovation, SDG 17	Increases in productivity if data is organised, processed and transferred effectively globally and used to drive better allocation of resources	Country economy and industry
	People, populism and inequality	SDG 4 Education, SG5 Gender equality, SDG 8: Economic growth and employment, SDG 10 Inequality, SDG 12 Sustainable consumption and production	Intersection between globalisation (flows of goods, capital and people), inequality and politics, public policy to reduce inequality and increase productive growth, e.g., labour market policies, investment and innovation	Country and local economy and industry
Pervasive technology	**Cyber security and privacy**			
	Digitisation and automation	SDG 8: Economic growth and employment, SDG 9 Innovation, SDG 17	Catch-up growth through adoption of existing best technological practice, improvements in robotics and AI could create large shifts in employment	Industry and country economy
	Renewable technology: transport, lighting, energy, insurance	SDG 7 Energy, SDG 12 Sustainable consumption and production	Globally, significant investment growth is required to meet Paris commitments – in renewable energy production, transmission (grids), transport and efficiency	Industry
	Biotechnology and personalised medicine	SDG 3 Health	Genome mapping and processing brings forward the prospect of rapid improvements in medical efficacy (prevention as well as diagnosis) and cost effectiveness	Industry and local economy
Environmental crises	**Transition to low carbon economy**	SDG 7 Energy, SDG 12 Sustainable consumption and production, SDG 13 Climate change	Transition and adaptation: Transition to a low carbon economy is the key adaptive response. Speed of technological proliferation and climate-related regulation key drivers.	Industry
	Regulatory shift: emissions, fossil fuel transition	SDG 7 Energy, SDG 12 Sustainable consumption and production, SDG 13 Climate change		
	Resource degradation	SDG 13 Climate change, SDG 12 Sustainable consumption and production	*See below*	
	Chronic: sea levels, desertification, water	SDG 6 Water, SDG 13 Climate change, SDG 15 Terrestrial ecosystems	Shifts in agriculture, water scarcity in drought prone areas and sea level rises in low lying areas are key	Country and local economy and industry
	Acute: severe weather, crop failures, drought, migration	SDG 2 Food security and agriculture, SDG 13 Climate change	Destruction of productive capacity due to infrastructure damage, disruptions to labour force, loss of economic capacity and food and water scarcity	Country and local economy and industry

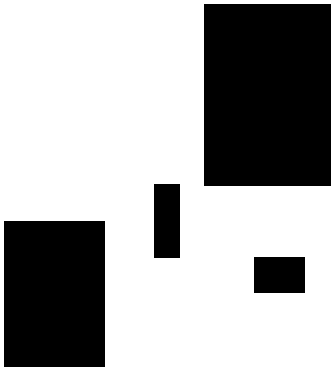
The Willis Towers Watson Asset Research Team

The Asset Research Team (ART) has two goals:

- **Goal 1:** Understand how economies and markets really work over the medium and long-term. Continuously improve that understanding.
- **Goal 2:** Use that understanding to improve the portfolios and outcomes of clients globally.

To achieve these goals the 13 person global team, led by David Hoile, researches mega and micro trends, all major economies, sectors and industries, and asset markets outcomes over short, medium and long-term horizons. ART's integrated process ensures that different areas (for example, economic and asset return forecasts) and different time horizons (for example, business cycle and megatrend factors) are analysed in a fully consistent way.

ART maintains a real-time set of short, medium and long-term economic forecasts and expected asset returns. These central forecasts and the rationale supporting them are published every month. Additionally, recognising the uncertainty of central forecasting, ART also produces detailed analyses of 'grey swan risks', for example, plausible future outcomes given the current state of the world. The specific grey swan risks chosen for analysis are determined by a combination of (1) an in-depth understanding of what is of material importance to institutional investors and businesses; and (2) the likelihood of that risk occurring.



The Thinking Ahead Institute

The Thinking Ahead Institute seeks to bring together the world's major investment organisations to be at the forefront of improving the industry for the benefit of the end saver. Arising out of Willis Towers Watson's Thinking Ahead Group, formed in 2002 by Tim Hodgson and Roger Urwin, the Institute was established in January 2015 as global not-for-profit group comprising asset owners, investment managers and service providers. It has over 40 members with combined responsibility for over US$13 trillion and aims to:

- Build on the belief in the value and power of thought leadership to create positive change in the investment industry
- Find and connects people from all corners of the investment world and harnesses their ideas
- Work to bring those ideas to life for the benefit of the end saver.

At the Institute we identify tomorrow's problems and look for investment solutions, which, we strive to achieve through:

- A dynamic and collaborative research agenda that encourages strong member participation through dedicated working groups
- A global programme of events including roundtable and key topic meetings, webinars and social events
- One-to-one meetings between Institute member organisations and senior representatives of the Thinking Ahead Group.

The solutions we collectively develop fall into three overlapping areas:

- Better investment strategies
- Better organisational effectiveness
- Enhanced societal legitimacy.

This framework guides the Institute research agenda and the desired output of each research project. The Thinking Ahead Group acts as the Institute's full-time executive. The Institute has a governance board comprising both Institute members and Thinking Ahead Group representatives.

Limitations of reliance

Limitations of reliance – Thinking Ahead Group 2.0

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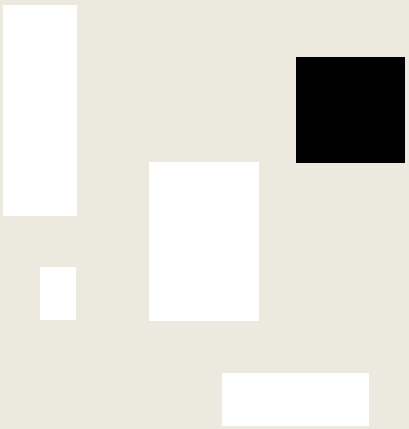

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