

C R D C
C R M C

COMMITTED TO
IMPROVE THE WORLD

World Economic Forum
91-93 route de la Capite
CH-1223 Cologny/Geneva
Switzerland
Tel.: +41 (0)22 869 1212
Fax: +41 (0)22 786 2744
Email: contact@weforum.org
www.weforum.org

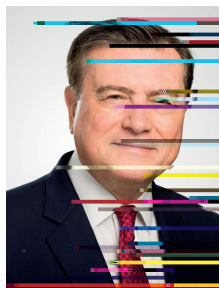
© 2020 World Economic Forum. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, including photocopying and recording, or by any information storage and retrieval system.

This white paper has been published by the World Economic Forum as a contribution to a project, insight area or interaction. The findings, interpretations and conclusions expressed herein are a result of a collaborative process facilitated and endorsed by the World Economic Forum, but whose results do not necessarily represent the views of the World Economic Forum, nor the entirety of its Members, Partners or other stakeholders.

Contents

Foreword	4
Preface	5
1. Executive summary	6
1.1 Transforming through uncertainty	6
1.2 Governance framework	7
2. Global systemic trends	8
2.1 Introduction	8
2.2 Case study insights	8
2.3 Where trends collide	10
2.4 A roadmap and decision-making framework for governance	11
2.5 Progress towards governance for global systemic risks	12
2.6 Active industry initiatives – next steps to continue progress	14
3. Transformational investment opportunities and challenges	15
3.1 Introduction	15
3.2 Climate change	16
3.3 Water security	17
3.4 Geopolitical stability	18
3.5 Technological evolution	18
3.6 Demographic shifts	19
3.7 Global low and negative real long-term interest rates	20
4. Navigating the roadmap	22
4.1 Critical questions and practical examples	22
5. Conclusion	24
6. Appendices	25
6.1 The governance roadmap – steps explained	25
6.2 Case studies	27
6.3 Acknowledgements	34
Contributors	36
Endnotes	37

Foreword



José Viñals,
Group Chairman,
Standard
Chartered

The need to address the long-term global systemic risks facing our economy, society and the planet has arguably never been greater. This report – based upon casework done in 2019 predating the global COVID-19 pandemic – represents an important step on the journey to effective collective action by the institutional asset owner community and the financial services industry.

This work creates a context for asset owners by laying the foundations for consideration of the most challenging global investment issues of our time. As economies and markets evolve, so do the inherent complexities that create opportunity and risk for investors and asset owners worldwide. We believe more sophisticated, adaptable and precise financial service solutions are needed to achieve long-term sustainable economic development, and to do so without negative impacts for society or the environment on which economic progress depends.

The insights within this report reflect those of a global community of sophisticated universal shareholders convened throughout 2019 and represent diverse vantage points. The scale, sophistication and investment time horizons of these asset owners gives them perspective on where to access investment opportunity and how to address global systemic risks at a policy and investment level.

The impact of the COVID-19 pandemic, which is tangibly illustrating the interconnected risks and real-time nature of our global economy, is covered in limited ways given the rapidly evolving nature of the crisis. Thoughtful application of this paper's framework during 2020 and beyond will lead to new insights on how the global investment community can improve and support society and sustainable economic development going forward against the threat of evolving global systemic risks.

We want to thank the World Economic Forum and Mercer for their work in preparing this report, convening insightful investors from around the world and creating a tangible framework that investors can use when thinking through challenging investment trends.



**Afsaneh
Beschloss,**
Founder and Chief
Executive Officer,
RockCreek

1. Executive summary

1.1 Transforming through uncertainty

The impacts of a specific corporation's behaviour on the environment, the economy and society have historically been viewed as "externalities". In the absence of explicit regulation (such as fines, taxation or subsidies), these "ancillary" or "indirect" impacts have generally not been factored into the pricing of individual securities because they are not expected to "show up" in the near-term cash flows of that security.

Global stakeholders – governments, corporations, individuals, universal shareholders (see inset) – have a vested interest in these externalities. Collective behaviour produces, or fails to mitigate, long-term global systemic risks that threaten the continued smooth and sustainable operation of our society, the economy or the planet.

Perhaps the most obvious of these risks, one that has already been the subject of substantial research, is climate change driven by human-initiated carbon emissions. Water security, geopolitical stability, technological evolution, demographic shifts and low and negative interest rates can also be evaluated as long-term global systemic risks.

All of these risks have characteristics in common. In particular, adequate responses require more than changing the behaviour of one government, one corporation or one individual. Collective action is necessary. As will be demonstrated through the specific case studies and more general qualitative discussion in this report, universal shareholders have great capacity to pursue transformational investments to mitigate these risks, while capturing attractive risk-adjusted investment returns. They are doing so in practice now, and these efforts are scaling as larger numbers of investors become better aligned and more involved. When individual universal shareholders act collaboratively, they can produce greater impact, faster; and this dynamic is driving a growing recognition of the importance of collective action by institutional asset owners.

In this paper, we focus on transformational investment from the viewpoint of the institutional asset owner community – the investor perspective. Recipients of transformational investment can include countries and cities that require capital and technology transfer to address these risks locally, and thus our conclusions are also relevant for these stakeholders – the investee (or "recipient") perspective.

Universal shareholders

We define a "universal shareholder" as an investor who holds a well-diversified portfolio of securities, with a long-term investment time horizon.

For this type of shareholder, a negative or positive externality produced by one corporation becomes a cost or benefit in terms of the productive capacity of society as a whole. The extent of its positive or negative impact ultimately affects the future cash flow of other corporations whose securities are held by the universal shareholder.

As a result, activities that were historically viewed as externalities at the level of an individual security need to be "internalized" or factored into investment decisions explicitly as relates to the owner's overall portfolio. This is necessary because these "externalities" have a direct impact on the sustainability of investment outcomes within the universal shareholder's broadly diversified investment portfolio.

Transformational investment

We define a "transformational investment" as an investment that is intended to derive an attractive risk-adjusted expected return within the context of a given asset owner's overall portfolio, and at the same time is expected to help mitigate or address one or more long-term risks.

Evaluating any one of the long-term global systemic risks on its own is a challenge, but taking interrelationships between the risks into account makes the task harder still. In addition, investors may be affected in different ways by a given risk depending on their specific circumstances and context. The effects of a risk can go beyond its impact on the fund's investment returns, as the funding entity and individual beneficiaries may also be affected directly or indirectly by the risk, separately from the investment outcomes. There is therefore a need to consider and analyse the appropriate approach for any specific investor holistically and broadly, as we will illustrate.

The challenges are magnified by the fact that conventions for the measurement and disclosure of most of these risks are either undeveloped or in the early stages of adoption.

If any of this were easy or simple, the available returns would be lower. With that said, the most sophisticated transformational investors have blazed a clear trail, which other investors can follow to potentially garner sustainable returns while mitigating systemic risks. Because of the growing recognition of the potential benefit of collective action for universal shareholders, the pioneers of transformational investment generally welcome other investors following in their footsteps. Being early, and then being proven right is a recipe

for sustainable outperformance in investing in general. For early adopters of transformational investment, seeing other asset owners follow isn't just an instance of the adage that imitation is the greatest form of flattery; following in this way provides liquidity, helps drive the cost of investment down through scale and helps produce the positive externalities that helped motivate the early adopters to pursue the investment in the first place – or mitigate the negative externalities. In short, transformational investment is one of the areas of economic activity in which collaboration helps produce better results.

Global systemic trends identified as most relevant to long-term investors, for the purposes of this report

- Climate change
- Water security
- Geopolitics
- Technological evolution
- Demographic shifts
- Low and negative real long-term interest rates

Case study contributors

- British Columbia Investment Management Corporation
- Ireland Strategic Investment Fund
- Mubadala Investment Company
- New Zealand Superannuation Fund
- Sunsuper
- USS Investment Management

Other contributors

- Asset owners
- Asset managers
- Financial institutions
- Academics

(SWFs) and other large asset owners to implement or execute their investment policies to mitigate these risks. An applicable example is the need to increase the supply of sustainability-related products and opportunities in a way that enables investors to find attractive risk-adjusted rates of return while mobilizing the needed volumes of capital to address climate change. The scope for deploying additional capital against these risks remains large. “Transformational investment gaps” can be estimated for each of the different risks. For example, we believe at least \$6.2 trillion per annum is needed for the combination of climate, water and demographics transition strategies alone.

From the investee (or recipient) standpoint, demand for transformational investment is particularly evident among emerging and frontier countries. However, most of these countries continue to struggle to attract the required capital for planned sustainable development – particularly in infrastructure. A growing supply of capital is available to invest in transformational investment opportunities that offer long duration profiles and diversification, but investor and beneficiary alignment remains lacking in most countries due to an inability to mitigate local political risk, ensure protection of ownership rights for investors and otherwise give investors confidence about the “rule of law”. Unfortunately, some of the geographies that most need transformational investment, and which could produce the strongest risk-adjusted returns for investors if political risk could be effectively mitigated, are the least able to attract investment.

Through interactive sessions and the development of illustrative case studies with sophisticated investors around the globe, this report has been produced to support efforts to allocate capital to positively affect our planet and society while earning strong risk-adjusted investment returns. Specifically, the report documents an established pathway for long-term investors to convert systemic risk uncertainty into sustainable investment opportunities.

This report:

Identifies **six global systemic risks** that affect global asset owners (additionally, pandemic risk with the specific example of COVID-19 is addressed in a paper supplementing this report)¹

Summarizes **case study insights** from large asset owners
Introduces a **governance and decision-making framework** (see illustration below), providing a pathway for investors to become experienced in translating risks into opportunities, while imposing discipline through holistic risk management – including a robust monitoring framework
Describes potential future **industry initiatives** that will

2. Global systemic trends

2.1 Introduction

Asset owners and investment managers face an evolving set of long-term risks and challenges, accompanied by opportunities for transformational investment. Some of these risks are not easily captured within conventional investment and risk management frameworks. These risks share characteristics including:

1. A long time horizon with widespread, sometimes global, impacts
2. Lack of accepted standards for measurement, and

	Climate change	Need for governments and businesses to address climate change ² -9.83 9-12 5,
	Water security	Exposure to declining quality or quantity of fresh water, affecting human health and/or economic activity.
	Geopolitical stability	Implications of rising global inequality, populism, protectionism, interstate conflict and threats to free trade.

Multiple potential outcomes are possible for each risk, ranging from the benign to the catastrophic. Universal shareholders have strong incentives to find transformational investments to respond to these risks. Effective transformational investments can support a smoother transition of society, economies and markets towards favourable outcomes, while generating attractive risk-adjusted investment returns for investors.

2.2 Case study insights

Some global investors are already practising transformational investment. Leading investors are responding to these risks in numerous ways despite hurdles, including lack of measurement and inadequacy of traditional risk/return analysis. Proactive engagement is visible in many areas:

Top-down stress and scenario testing to quantify exposures to systemic risks within portfolio investments. In many cases, this has required the development of, or collaboration to build, the underlying risk models and a commitment to evolve these over time





Demographic shifts

Sunsuper considers demographics to be a key input into the fund's investment objectives.

- Sunsuper conducts quantitative measurement and

The complicated interrelationship of risks calls for a holistic approach to strategy development and risk management – one that is well suited for long-term investors such as SWFs, insurers and other large asset owners. Their multi-decade time horizon positions them to look further into the future than typical asset managers when making investment decisions, considering the impacts of risks and opportunities and leveraging their capabilities to uncover, stimulate and manage investments that aim to achieve their transformational objectives and policy mandates.

2.4 A roadmap and decision-making framework for governance

The six global systemic risks challenge conventional investment and risk management practices. At best, investors can only partially observe their effects as they have limited historical experience. Despite the ability of systemic risks to compound economic and financial system stresses, the risks are often not identified effectively, priced efficiently or measured and managed.

The following six-step governance and decision-making framework equips long-term investors with a governance process and set of actions intended to transform the global systemic risks into sustainable return opportunities. The roadmap builds on successful collaborative industry initiatives, such as the Santiago Principles for SWFs,³ and the Financial Stability Board (FSB) Task Force on Climate-Related Financial Disclosures (TCFD) designed for all entities.

The particular potential benefits of this framework include:

1. **Pathways** for investors aspiring to become market leaders in addressing global systemic risks
2. **Discipline** in achieving holistic management and addressing global systemic risks
3. **Collaboration** to tackle and adapt to challenges:
 - a. Identifying stakeholders with aligned interests
 - b. Developing encompassing approaches that solve risk interdependencies
4. **Monitoring** through measures that establish foundational understanding of risk impact



1. Understand
the overall impact on
the funding entity,

Key progress takeaways from case study reviews, in-person meetings and interviews include:



On **climate change** issues, leading investors have established beliefs, processes and portfolio allocations. Some have made significant allocations to renewable energy or “cleantech” investments. However, material change is not yet apparent in investor responses to the major drivers of carbon emission increases, including among the highest carbon-producing countries – e.g. China, the US and India. Downside shocks in oil prices (e.g. to prices below \$30 per barrel) will make renewable energy less competitive in the near term but do not change the long-term outlook for fossil fuels. Finding enough attractive risk-adjusted investments to gradually reduce overall emissions of portfolio assets to align with the Paris Agreement by 2050 (in accordance with the Net-Zero Asset Owner Alliance)⁵ continues to be a challenge.



Water security is sometimes not viewed independently from climate change. Climate change risks often manifest as water risks – for example, through larger storms, greater flooding and longer droughts. However, societal and funding entity effects from water risk emerge locally, meaning that the risk impacts and transformational solutions are often different


3. Transformational investment opportunities and challenges

3.1 Introduction

The opportunities and challenges faced by universal shareholders cut across government jurisdictions and often require cooperation between nations, states/provinces, cities, corporations and asset owners. Shoots of innovation and hope are strong in some places: Governments and asset owners are already pursuing broader stakeholder objectives, including many that address long-term trends.

They are investing in segments that enhance economic development and working to overcome and address regional tensions and resource imbalances in the process.

That said, we have far to go and the numbers speak for themselves. Based on various studies, the table below provides a directional sense of the scale of investment needed to address today's most significant global challenges – quantifying the investment “gap” or opportunity and identifying examples of transformational investments.

Global systemic risk	Investment gap (per annum)	Transformational investment examples
Climate change 		

We are now seeing the beginnings of decarbonization as a response in markets. For example, in the MSCI ACWI Index, 45.5% of companies in the Utilities sector reduced their carbon intensity between 2014 and 2019. In the Energy sector, 19.8% of companies and in Materials 24.6% of companies have reduced their carbon intensity in the same period.¹⁸ Significant capital is required to transition to sustainable long-term solutions.

Transformational opportunities

Global transformational investors are active at many levels, restructuring investment policies, working to change beliefs and revising governance frameworks from the top down to create a climate context for entire organizations; bottom-up scenario analysis and climate stress-testing is being used to define return impacts at the asset class, sector and portfolio levels. Sustainable themed equities (including renewables), green bonds, sustainable infrastructure, green private equity and low- and zero-carbon indices represent expanding areas of investment activity.

Bottom-up company analysis and portfolio construction is focused on decarbonization and reallocation of assets to sustainable ventures in both public and private markets. Examples include:

- Information technology focused on climate solutions
- Cleantech infrastructure and renewable energy, including onshore wind and solar, hydro, geothermal
- Sustainable natural resources such as seed development, water, fertilizer, food and nutrition, production of crops
- Aquaculture assets
- Materials such as copper, because wind and solar installations are more copper-intensive than conventional power plants and copper is critical for electric grids, battery-charging infrastructure and electric vehicles
- Implementation approaches, including pure play and sustainable themed strategies, and portfolio tilts and overlays

3.3 Water security



State of play

All life on Earth and most economic activity and industry depends on abundant and clean water. Cross-sector dependency on water by households, agriculture, industry, energy and transport make water

3.4 Geopolitical stability



State of play

Income and wealth inequalities around the globe are fuelling populism, protectionist policies, trade tensions and the risk of further economic fragmentation.

Global inequality is drawing increased attention as nearly half the world's population (3.4 billion people) are living on less than \$5.50 per day – while the world's richest 1% have more than twice as much wealth as the other 6.9 billion people do in aggregate.²⁸

A slowing or reversal of globalization, which has been important to economic development, can be observed through the stagnation of global trade. Between 1970 and 2008, international trade increased as a share of global GDP at an average rate of approximately 3% per annum. By contrast, since 2008 it has stagnated.²⁹ The 3% growth that has been lost represents approximately \$2.8 trillion per annum in today's terms. Similarly, net inflows from foreign direct investment have collapsed back to pre-2000 levels.³⁰

The evolution of technology in public markets is illustrated by S&P and MSCI renaming the telecommunications services sector as communication services in September 2018. Within the S&P 500, companies valued at approximately \$2 trillion were reclassified into communication services, with \$1.24 trillion moved from information technology and \$620 billion from consumer discretionary. This is a result of a transformation in the ways in which people communicate and seek information.³³

In recent years, the dominance of technology has been a factor in the contraction of public market listings. The low capital intensity of tech firms enables them to remain private entities for longer, without the need to tap public markets. However, we believe public markets remain a valuable source of liquidity.

Transformational opportunities

Characteristics of investors successfully positioning to potentially benefit from technological evolution include:

1. Commitment to early-stage private market investing and participation in additional investment rounds
2. Using data aggregation/translation tools to develop insights
3. Increasing the capacity to execute transactions more quickly
4. Establishing corporate cultures that support tech-related agility and innovation

Investments in technological innovation at an earlier stage, such as via venture capital, can produce attractive returns and hedge against losses associated with stranded assets and obsolescence. They also create opportunities for later (larger) rounds of investment and the capacity to learn from, invest in and adopt technology early. To the extent that an asset owner is concerned that an entire industry sector may be vulnerable to technological disruption, the owner can attempt to hedge the risk of a loss of value in its publicly traded exposure to this sector, by investing through venture capital and private equity in the companies that are driving the attempt at disruption.

Asset owners need to be able to attract, develop and retain specialized teams that enhance the organization's capacity to properly understand the unique investment considerations of specialized areas (e.g. artificial intelligence, healthcare, business systems, etc.), and to invest effectively at earlier stages. Investment teams and approaches need to be highly dynamic to manage the rapidly changing environment of technology, and recognize the potential for apparent disruptors to become disrupted themselves (in this regard, diversification of investments is also crucial). In some cases, partnering with external specialists in disruptive technology may be a preferred option.

Many asset owners focus attention on technological "solutions" to climate change. Innovations in electric vehicles, energy efficiency, battery storage, solar paint and tiles, and carbon sequestration are just part of the evolving technological response to the challenge of climate change. However, large-scale investors have a particular role to play with regards to nationally or supra-nationally meaningful, transformational technological infrastructure projects, particularly in the areas of battery storage, grid expansion or supercharger networks, the lack of which may be a major constraint on transition.

The misuse of technology threatens nation states and individuals. Apart from asset owners themselves needing robust cyber-risk management processes, there is a broader role for universal shareholders to collaborate globally to further technology-related solutions with adequate ethical, compliance and regulatory standards. The size and dominance of mega-tech naturally attracts regulatory attention, and asset owners can influence change where it is needed.

Technology is perceived by some as having contributed to income inequality. However, technology has clearly opened doors for some of those living in extreme poverty by connecting them to the global economy in ways not seen before. Provision of the practical technology that is needed in areas in which extreme poverty remains prevalent renewable energy – battery storage, mobile networks, fintech solutions, for instance – can transform communities.

3.6 Demographic shifts

State of play

The availability of extensive demographic data

Today, the COVID-19 pandemic is driving valuations lower and pushing economies into recession. To rescue financial markets and the global economy, governments are turning to the 2008/2009 playbook, intervening using fiscal stimulus through tax reductions and “helicopter money” – pumping liquidity into markets via asset purchases, and pursuing aggressive monetary policy stimulus.

While these tactics worked during the 2008/2009 crisis and may help today, they risk creating long-term problems. By acting as both an issuer and purchaser of their own debt, governments may distort the balance of supply/demand curves across capital markets and undermine investors’ capacity to accurately quantify and respond to market risks. With interest rates already near zero, central banks are left with limited capacity to stimulate economic growth, which increases the pressure on governments to respond with fiscal stimulus. If excessive, this increases longer-term inflation risk – even though deflation is arguably more of a concern currently.

Universal shareholders play a unique role as both benefactors and influencers in their capacity to interface with government and quasi-government stakeholders, asset managers, academics and other forward-looking parties. They also have an incentive and the resources to research and resolve capital market stabilizing mechanisms.

Transformational opportunities

Maintenance of public and private financial stability has a long-term societal benefit by allocating capital to worthwhile activities, safeguarding effective decision-making through rewarding risk appropriately and instilling the confidence required to make long-term investments.

4. Navigating the roadmap

4.1 Critical questions and practical examples

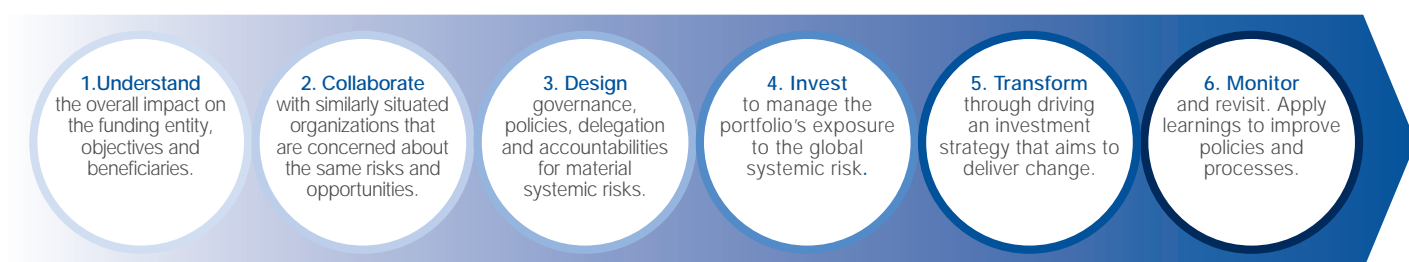
The governance steps and critical questions set out below enable investors to integrate considerations of global systemic risks into existing frameworks. Examples, assessed through case studies, in-person meetings and other interactions, show established applications.

Governance step	Critical questions	Examples
<p>1. Understand</p> <p>... the overall impact on the funding entity, objectives and beneficiaries</p>	<p>a. How does the systemic risk materially affect stakeholder economic and investment objectives?</p> <p>b. Are methods of risk measurement and transparency of reporting adequate?</p> <p>c. Is the systemic risk one that is not already adequately addressed within the existing investment process (e.g. by asset managers), due to a mismatch in the investment time horizon or possibly some other principal/agent or structural challenge?</p> <p>d. Is investment return the only measure of risk and impact associated with this systemic risk?</p>	<ul style="list-style-type: none"> – The NZ Super Fund (NZSF) has a public funding formula which determines that the fund will not peak in size as a percentage of GDP until the 2070s, making it a genuine long-term investor. It recognizes and addresses climate change as a material long-term investment risk over the fund's investment horizon. – Norway's SWF, the Government Pension Fund Global (GPF), was funded in 1996 to shield the economy from volatility in oil revenue.⁴⁰ In its 2020–2022 strategy, it acknowledges that trends and disruptions in the global economy such as increased trade barriers, low global interest rates, changing technology paradigms and climate change will affect the fund, and stakeholders need to be prepared for large potential fluctuations in the fund's value.⁴¹ – Sunsuper, being a defined contribution fund, primarily focuses on the delivery of real investment returns to members, with economy-wide demographics influencing potential long-term real returns. In addition, fund member demographics are an important consideration within the fund's broader corporate strategy, influencing product design, financial metrics, member communications and financial advice.
<p>2. Collaborate</p> <p>... with similarly situated organizations that are concerned about the same risks and opportunities</p>	<p>a. Is the fund identified as a transformational leader, contributing positively to mitigating the systemic risk?</p> <p>b. Is the fund collaborating with industry groups, communities or other initiatives?</p> <p>c. Has the fund participated in initiatives that estimate the value of investment required in its jurisdiction to support resilience to the trend and associated risks?</p> <p>d. How does the fund map its stakeholder landscape, establish priorities and communicate as part of engagement?</p>	<p>Norges Bank Investment Management (NBIM), which manages GPF, has been studying and leading on water risk within the investment community and produced a public report on <i>Managing Water Risk</i>.⁴²</p> <p>Three leading pension funds – the Government Pension Investment Fund of Japan (GPIF), California State Teachers' Retirement System (CalSTRS) and USS Investment Management (USSIM) – jointly released a collaborative statement agreeing on principles for asset owners acting as stewards for sustainable capital markets. It highlights their commitment to integrating systemic risk into their investment activities. Similarly, they indicate their preference to work with asset managers that integrate ESG throughout their entire investment process and urge the partners and companies with which they work to enhance their disclosures, using frameworks such as the TCFD and Sustainability Accounting Standards Board (SASB), to help drive sustainable economic growth for customers, beneficiaries and society.⁴³</p>

5. Conclusion

Climate change, water security, demographic shifts, technological evolution, increasing geopolitical uncertainty and global low and negative real long-term interest rates are likely to continue to have a major effect on long-term expected returns. Case studies show that SWFs and other long-term investors are already positioning themselves to respond to the impact of these global systemic risks on investment. However, greater innovation in practice and commonality of action is still required in most areas.

While interrelationships between these trends create complexities, such interrelationships also make it possible to address some of the trends simultaneously. For example, certain types of infrastructure, venture capital and cleantech investments can be transformational investments for climate change, geopolitical stability and technological evolution. Meanwhile, we believe the capital needed to address the global systemic risks likely exceeds \$6.2 trillion per annum.



We believe the significant capacity of universal shareholders to pursue transformational investments while capturing attractive risk-adjusted investment returns is critical to further progress. To enable progress, robust governance is needed. The potential benefits of the six-step roadmap include:

1. **Pathways** for investors aspiring to become market leaders in addressing global systemic risks
 2. **Discipline** in achieving holistic management and addressing global systemic risks
 3. **Collaboration** to tackle and adapt to challenges:
 - a. Identifying stakeholders with aligned interests
 - b. Developing encompassing approaches that solve risk interdependencies
 4. **Monitoring** through measures that establish foundational understanding of
3. Monitor / T1 measurough ive rd. 2t1 an [long-1 eturonhro2 thm_0 1 Tf 0 Tw -1o'Dociuri8 fyinggroughnBy -0lo 417 7 -1eanun1or nd a

6. Appendices

6.1 The governance roadmap – steps explained

This section outlines the six steps of the governance roadmap for approaching global systemic risks. It explains each step of the process and then identifies areas of impact.

Understand

... the overall impact on the funding entity, objectives and beneficiaries

Governments establish SWFs for a variety of policy purposes, including stabilization, savings, reserve management and economic development. Their mandate, investment horizon, liquidity position and the economic context of their funding entity will directly affect their prioritization of different risks. To determine the materiality of the impact of global systemic risks and associated insecurities, it is necessary to establish whether individual risks:

1. Threaten the continuation of funding
2. Negatively impact the fund's ability to achieve investment objectives
3. Create undesirable outcomes for beneficiaries, separate from the impact on investment returns

Collaborate

... with similarly situated organizations that are concerned about the same risks and opportunities

Long-term asset owners can benefit from collaborating with peers and partnering with asset managers, data providers, financial institutions, non-profits and governments to build resilience to material global systemic risks. Collaboration can help reduce individual fund costs and open investment opportunities, while helping to drive systemic change and market reform. Examples of collaboration include the PRI, the Organisation for Economic Co-operation and Development, the International Forum of Sovereign Wealth Funds, One Planet Sovereign Wealth Funds and the TCFD. The scale of global systemic risks can be better addressed through the pooling of collective capital and alignment of voices – which can help drive a market for transformational investments offering attractive returns.

Design

... governance, policies, delegation and accountabilities for material systemic risks

Funding entity objectives should be clearly addressed through policies, processes and systems, recognizing the impact of global systemic risks. Sustainability of future funding commitments, distributions and potential withdrawals can have a material impact on the capacity of a fund to meet its objectives. Alignment of the accountabilities and control of the funding entity, appropriate oversight, delegation processes and

incentives for investment managers and teams promotes efficient capital allocation. This includes the evaluation of existing resources to efficiently identify internal capabilities and opportunities to delegate externally for implementation assistance.

Invest

... to manage the portfolio's exposure to global systemic risk

The varying impacts of global systemic risks across asset classes, regions, sectors and markets suggest actions for investors to consider in allocating assets, constructing portfolios and other investment decisions. Investors can adjust their portfolio exposure across areas that are expected to outperform and/or underperform to optimize returns at the total portfolio level. For example, many very large diversified asset owners are effectively universal shareholders. As such, they have significant exposure to global systemic risks through passive investments and market beta from active investments.

Benchmarks for actively managed strategies can also be adjusted to optimize or limit risk due to specific themes; for example, low-carbon equity indexes. Meanwhile, long-term investors should think about allocating to opportunities created by long-term structural trends within actively managed investment strategies, with the view of systemic disruption as a source of alpha. Approaches may include integrating the consideration of themes into investment processes or carving out dedicated buckets for thematic or impact investing.

Partnerships with asset managers and other financial institutions should be philosophically aligned, particularly in terms of the investment time horizon. Asset managers and investment teams are typically given incentives to optimize performance over short-term periods due to basis risk against market capitalization benchmarks and against their peers. Longer-term incentives are typically structured around managing performance through business cycles. However, global systemic trends have much longer time horizons. By creating stronger alignment in terms of compensation, incentives and benchmarks, asset owners can act as a bridge between the time horizons of long-term trends and those of asset managers and investment teams.

Transform

... through driving investment strategy that aims to deliver change

SWFs and other large asset owners can manage negative externalities and help create value by partnering with governments to identify opportunities in global or regional issues, such as climate change or water scarcity and supply. Transformational investors engage with policy-makers and regulators to understand the potential impact of policy and regulation change on the financial system, to reduce the risk of permanent system disruptions. Scenario modelling and reference portfolios that chart the transition pathway to a net-zero carbon economy are examples of important frameworks for investors to develop a staged response to climate risks and to harness other sustainable growth opportunities. Similar approaches can be taken to other systemic risks to support the transition to favourable demographic outcomes, technological advancement and so on.

Monitor

... and revisit. Apply learnings to improve policies and processes

These global systemic risks are typically long term and align differently against the investment horizons of different asset owners. However, interactions between systemic risks make the accurate measurement and monitoring of risks challenging. Increased data and technology are enablers of better risk management and are needed to generate more effective insights into risks and opportunities, guiding activities such as due diligence, valuation, monitoring and engagement. Through experience and learning, effective feedback loops help improve governance, policies and processes.

New Zealand Superannuation Fund

About

The New Zealand government uses the New Zealand Superannuation Fund to save now in order to help pay for the future cost of providing pensions. In this way, the fund helps smooth the cost of superannuation between today's taxpayers and future generations. It operates by investing government contributions – and returns generated from these investments – in New Zealand and internationally in order to grow the size of the fund over the long term. The fund is a long-term, growth-oriented, global investment fund. As at June 2019, the fund managed NZ\$43 billion (~\$25 billion). The NZSF is managed by the Guardians of NZ Superannuation (the Guardians), a Crown entity.

Approach to climate change

The New Zealand Superannuation and Retirement Income Act 2001 requires the Guardians to apply best practice portfolio management, maximize return without undue risk to the fund as a whole and avoid prejudice to New Zealand's reputation. As a result, the Guardians have developed strong and responsible investment strategies, including a climate change strategy.

The Guardians believe carbon risk is being underpriced. This is partly because the time horizon over which the effects will manifest is too long for most market analysts – but it is relevant for the time horizon that matters for the fund (on current projections, the government will not make significant withdrawals from the fund until the 2050s).

The Guardians take the view that if markets are underpricing carbon risks, then reducing exposure to the most at-risk assets is likely to improve the portfolio's long-term risk-adjusted returns. On the other hand, if it turns out that markets have been efficiently pricing these risks all along, then some fairly priced assets would have been sold and swapped for other fairly priced assets. The impact on returns will be minimal over the long term, with the main cost being a minor reduction in portfolio diversification. Accordingly, the Guardians consider that ignoring climate change in investment decisions would constitute taking "undue risk" and climate change must be factored into investment decision-making at a portfolio level on an ongoing basis.

In addition, the Guardians believe climate risk is important as it:

- Is different from other investment themes, such as demographics. It has multiple drivers and uncertainties in the time horizon over which the impacts will play out. It encompasses both listed and alternative assets, but it affects them in different ways and requires a shift

in the source of energy that influences all sectors. It is an intergenerational and cross-boundary issue, one that requires (and is seeing) significant coordination between countries

- Offers opportunities for investment as well as risk; for example, with the development of more energy-efficient and alternative technologies

In 2016 the Guardians launched their climate change investment strategy (CCIS). The goal of the CCIS is to make the portfolio more resilient to climate-related risk. The strategy has four core work streams – reduce, analyse, engage and search.

As part of the CCIS, the Guardians announced a whole-of-portfolio climate change expectation to reduce the fund's carbon exposure by 2020: a 20% reduction in carbon emissions intensity and 40% reduction in potential emissions from reserves. These are measured relative to the original reference portfolio.

As part of the [active](#) strand of the CCIS work stream, in 2017 the Guardians "decarbonized" the reference portfolio by reallocating NZ\$950 million in passive investments away from companies with high exposure to carbon emissions or reserves and into lower-risk companies. The Guardians developed a bespoke methodology to make these reductions for the reference portfolio using MSCI's carbon metrics.

Since 2017, the methodology has been applied to the active part of the portfolio, including active equities, to externally

reduce

an appropriate increase or decrease to the discount rate or multiple based on its climate change ranking relative to its peers. Lastly, where it is not possible to easily or reliably quantify the impact of climate change on the business, but where there is likely a material impact on value, discount rates are adjusted. However, this is not a prescriptive mechanical solution and the Guardians do not yet have an “in-house” view on what climate change scenario(s) (and associated consequences) should be assumed.

As part of the work stream, the Guardians engage with companies, managers and policy-makers to seek better climate risk management, adaptation and disclosure in investee companies. With the External Investments and Partnerships teams, the Responsible Investment team has reviewed the climate engagement work conducted by listed equity investment managers. The Guardian are also part of the CA100+ climate engagement initiative, engaging with the worst emitters globally to reduce

2. **Strategic asset mix decisions** – for example, scenario analysis related to economic/political regimes and possible future climate change outcomes
3. Within each **asset class**, teams focus on areas of disruption that are most pertinent to their mandates
4. For **individual direct investments**, risks are evaluated as part of the due diligence process and ongoing asset management process
5. Through a **dedicated team** that monitors and models the implications of macroeconomic shocks/regimes

BCI is invested in sectors globally that rely heavily on water, such as utilities, energy, construction and oil and gas. These industries are naturally exposed to water-related risks such as quality, demand, supply and regional needs. Their operations also have an impact on regional water availability and water quality, potentially exposing them to reputational risk and regulatory restrictions. Hence, BCI wants to know that its invested companies are prepared for challenges in a world in which water is an increasingly constrained resource.

Water risk is considered specific to each type of investment decision, and assessment of water risk varies depending on the sector and its reliance on low-cost supply – particularly

explicit consideration of global systemic trends, primarily through measures of investment performance. Advice from

interconnected risks and opportunities that are better

While potential growth is the focal point, second-order considerations are not ignored. For example, the extent to which persistently lower inflation affects future productivity is considered; however, the linkage between an ageing population and lower inflation has not yet been sufficiently proven to warrant an adjustment. Similarly, the persistence of real interest rates below potential growth is another possible depressor of future productivity; however, in this case it is not yet clear that real interest rates can and will be sustained indefinitely at these levels.

Scale and long-term ownership enables the fund to focus on management for long-term outcomes. Sunsuper's long investment horizon leads it to invest in more illiquid investments, directing it to consider global systemic risks over a longer time horizon. Sunsuper can support investment to future-proof a business in a way that a listed company or minority investor cannot due to short-term metrics. Scale is also a positive as the ability to drive down fees while accessing diversifying opportunities in alternative assets becomes more critical as forward-looking returns (due to demographic shifts) become lower. However, being large limits the fund's ability to justify the work required to access small-scale opportunities with an appropriate level of due diligence and reduces the capacity to be nimble and easily exit "stranded" businesses when that risk becomes apparent.

Sunsuper reviewed and reduced its suite of fund investment objectives four years ago by 0.5–0.75% per annum. This was consistent with the anticipated impact of ageing populations, with forecast workforce global growth being lower by a similar quantum.

Sunsuper is also focusing on: climate change; geopolitics and inequality; technology-related risk; the changing nature of currency markets; the implications of the growing scale of the Australian superannuation industry on domestic stock markets; and frameworks for investing large-scale pools of assets efficiently and effectively.

Ireland Strategic Investment Fund

About

The Ireland Strategic Investment Fund ("ISIF", or the "fund"), managed and controlled by the National Treasury Management Agency, is a sovereign development fund, with €15 billion⁴⁴ (~\$17 billion) in assets under management as at December 2019. This case study focuses on the ISIF discretionary portfolio, which comprises the fund excluding public policy investments.

The ISIF has a "double bottom line" mandate that requires it to invest the discretionary portfolio in a manner designed to support economic activity and employment in Ireland, in addition to delivering commercial returns. As regards commercial returns, the ISIF is required to seek to generate a return over the long term in excess of the cost of Irish government debt.

Approach to sustained low interest rates and demographic shifts

The ISIF's high-level investment themes (regional development, housing, indigenous businesses, climate and Brexit) have been determined in consultation with relevant government ministers. The ISIF's ability to create economic impact (i.e. supporting economic activity and employment in Ireland, while not "crowding out" private capital) is central to the development of fund-level investment themes. The ISIF has a "double bottom line" mandate which requires that all investments are designed to generate both a commercial return and an economic impact.

The size of the ISIF is large in the context of the Irish economy and it still has significant uncommitted capital. Therefore, the fund has heightened sensitivity to economic impact risk with a view to ensuring that its investment activities do not contribute to overheating of the Irish economy. The investment strategy for the fund reflects its size and nature, with particular focus, through its high-level investment themes, on specific risks such as demographic changes and climate change.

Ireland has one of the youngest population structures in Europe and relatively high levels of fertility and immigration, and is therefore ageing more slowly than its neighbours. These demographic trends in Ireland and the reduced levels of housing construction post-global financial crisis have resulted in insufficient housing stock, with elevated house prices and a high cost of renting. As a result of this, housing is one of five priority investment themes of the ISIF.

More broadly, analysis and assessment of demographic changes are vital for real estate investment – residential housing, commercial real estate and other real estate. Global demographic trends are also incorporated into the fund's investment strategy and mainly focus on export-orientated sectors. For example, the rising population and income changes predicted for Asia positively affect investment in food and agriculture in Ireland.

The ISIF's commercial return objective in respect of its discretionary portfolio is set out in legislation; however,

It of rentinwevc o.ort rata3 rn hich -estmenoweverere age

The ISIF has developed a scorecard to measure economic impact. It is fully embedded in the wider investment process and assessed as part of any investment decision. This outlines quantitative projections (Gross Value Added [GVA] and employment forecasts) and qualitative projections. An economic impact risk score is assigned to each individual investment, which assesses the probability of additionality arising from the investment. The ISIF carries out an economic impact survey process for the entire Irish portfolio on a semi-annual basis, plus an annual review of output versus the relevant economic impact scorecard. Each investment/asset is also measured against the

fundJO 18.2 (ed aish) ent omme(elentci.3 economt (e-17.9 (n loymGlue AdA/ent for)18.-1.2 Td(and ass entc impact scor)1SIF ca

Mercer
Alex

Jo Taylor, Ontario Teachers' Pension Plan, President and Chief Executive Officer

Allyson Tucker, Washington State Investment Board, Chief Investment Officer

Theresa Whitmarsh, Washington State Investment Board, Executive Director

Zhang Yi-Chen, CITIC Capital Holdings, Chairman and Chief Executive Officer

Franziska Zimmermann, Temasek International, Director of Sustainability and Institutional Relations

A . M F
Caroline Atkinson, RockCreek, Senior Advisor

Barry Blattman, Brookfield Asset Management, Vice-Chair

Marie Brière, Amundi, Head of the Investor Research Center

Massimiliano Castelli, UBS Asset Management, Managing Director, Head of Strategy and Advice

Christian Deseglise, Head of Sustainable Finance and Investments, Global Banking and Markets, HSBC

Christian Hille, DWS Investments, Global Head of Multi Asset and Solutions

Luciano Jannelli, Abu Dhabi Commercial Bank, Head Investment Strategy

Sudhir Krishnamurthi, RockCreek, Senior Managing Director

Richard F. Lacaille, State Street Global Advisors, Global Chief Investment Officer

Kate Moore, BlackRock, Head of Thematic Strategy

Christopher Payne, Peninsula Real Estate, Chief Economist

Jean Raby, Natixis Investment Managers, Chief Executive Officer

Hashim Shawa, Bank of Palestine, Chairman

Brian Singer, William Blair, Head of Dynamic Allocation Strategies Team

Jeff Spiegel, Blackrock, Director, Head of iShares Megatrend and International ETFs

Ronald van der Wouden, RockCreek, Managing Director

Andrew S. Weinberg, Brightstar Capital Partners, Founder, Managing Partner and Chief Executive Officer

Q . C
Faruk Ak, Crescent Petroleum, Commercial Manager

Mohammed Al-Rahbi, Ominvest, AVP Investments

Victoria Barbary, International Forum of Sovereign Wealth Funds, Director of Strategy and Communications

Mathias Cormann, Minister for Finance, Leader of the Government in the Senate of Australia

Nicholas Drysdale, Crescent Petroleum, Finance Manager

Martin Jagger, Abu Dhabi National Oil Company, Manager, Business and Market Intelligence, Executive Office

Celeste Lo Turco, NEOM, Director of Board Relations

Ed Rawle, Abu Dhabi National Oil Company, Chief Economist

Tejpreet Singh Chopra, Bharat Light and Power, Founder and Chief Executive Officer

Daniel Yergin, IHS Markit, Vice-Chairman

A
Bernardo Bortolotti, NYUAD Social Science Division, Visiting Professor

Winston Ma, NYU School of Law, Adjunct Professor

Nouriel Roubini, New York University, Stern School of Business, Professor of Economics

Patrick Schena, The Fletcher School of Law and Diplomacy, Tufts University, Co-Head Sovereign Wealth Fund Initiative

Contributors

Lead author

Richard Silvan, Project Fellow, World Economic Forum (on secondment from Mercer)

World Economic Forum

Maha Eltobgy, Head of Shaping the Future of Investing; Member of the Executive Committee

William Hoffman, Practice Lead, Long-Term Investing

Katerina Labrousse, Platform Curator, Long-Term Investing, Infrastructure and Development

Adam Robbins, Head, Long-Term Investing

Project co-chairs

Afsaneh Mashayekhi Beschloss, Founder and Chief Executive Officer, RockCreek

José Viñals, Group Chairman, Standard Chartered Plc

1. Mercer, Navigating a Pandemic-Driven Market Crisis, 2020, <https://www.mercer.com/our-thinking/wealth/navigating-a-pandemic-driven-market-crisis.html> (accessed 22 May 2020).
2. World Economic Forum, *Global Economic Prospects 2020*, 15 May 2020, 2020.
3. International Forum of Sovereign Wealth Funds (IFSWF), *Principles for Sustainable Investment*, <https://www.ifswf.org/santiago-principles-landing/santiago-principles> (accessed 11 May 2020).
4. Mercer's assessment-based views were developed through consultation with industry partners.
5. The members of the Net-Zero Asset Owner Alliance commit to transitioning their investment portfolios to net-zero GHG emissions by 2050 consistent with a maximum temperature rise of 1.5°C above pre-industrial temperatures, taking into account the best available scientific knowledge, including the findings of the IPCC, and regularly reporting on progress, including establishing intermediate targets every five years in line with Paris Agreement Article 4.9 (UN Environment Program Finance Initiative, *Net-Zero Asset Owner Alliance*, 2019).
6. IPCC estimates annual investment in energy systems to 2035, limiting global warming to 1.5°C, needs annual average investment in the energy system of around \$2.4 trillion (at 2010 rates) between 2016 and 2035 (Intergovernmental Panel on Climate Change, *Global Warming of 1.5°C*, 2018).
7. According to the OECD, the broader needs for water infrastructure range from \$6.7 trillion by 2030 to \$22.6 trillion by 2050 (Organisation for Economic Co-operation and Development, *OECD Environment Outlook 2017: Water*, 2017).

26. Ceres, *Ceres Climate Change Financial Risk Assessment*, 2018.
27. Ceres, *Climate Change Financial Risk Assessment*, GGM, 2018.
28. Oxfam, *Climate Change Financial Risk Assessment*, 2020.
29. The World Bank, *Climate Change Financial Risk Assessment* (% GDP), <https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS?view=chart> (accessed 4 May 2020).
30. The World Bank, *Climate Change Financial Risk Assessment*, *Non-Financial (% GDP)*, <https://data.worldbank.org/indicator/BX.KLT.DINV.WD.GD.ZS?view=chart> (accessed 4 May 2020).
31. Principles for Responsible Investment, *Climate Change Financial Risk Assessment*, 2019.
32. Principles for Responsible Investment, *Climate Change Financial Risk Assessment*, 2020.
33. S&P Dow Jones Indices, *Climate Change Financial Risk Assessment* & 500, 2018.
34. McKinsey Global Institute, *Climate Change Financial Risk Assessment*, 2015.
35. These estimates have not yet been updated to reflect the impact of COVID-19, with the potential long-term impact at the time of writing unknown.
36. McKinsey Global Institute, *Climate Change Financial Risk Assessment*, 2015.
37. European Commission, Joint Research Centre, *Climate Change Financial Risk Assessment*, 2018.
38. Mercer, *Investment in African Infrastructure Challenges and Opportunities*, 2018.
39. Mercer, based on "Barclays Live" data.
40. Norges Bank Investment Management, *Climate Change Financial Risk Assessment*, 2019.
41. Norges Bank Investment Management, *Climate Change Financial Risk Assessment*, 2020-2022, 2019.
42. Norges Bank Investment Management, *Climate Change Financial Risk Assessment*, 2020.
43. Government Pension Investment Fund (Japan), *Climate Change Financial Risk Assessment*, 2020.
44. The ISIF is comprised of the discretionary portfolio (€8.1bn) and the directed portfolio (€6.9bn). The discretionary portfolio has a "double bottom line" mandate to invest on a commercial basis in a manner designed to support economic activity and employment in Ireland. The directed portfolio (primarily public policy investments in AIB and Bank of Ireland) continues to be held within the ISIF pursuant and subject to direction from the minister for finance.

