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**1in1000**

**Integrating future risks & challenges into investment metrics,  
processes, and financial regulation**

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## About 1in1000

1in1000 is a new research program by 2° Investing Initiative that brings together new & existing research projects on long-termism, climate change, and (inter-)connected future risks for financial markets, the economy, and society. Its objective is to develop evidence, design tools, and build capacity to help financial institutions and supervisors to mitigate and adapt to future risks and challenges. The program focuses on climate change and the universe of risks and challenges linked to climate change, notably ecosystem service and biodiversity loss, as well as risks from a decline in social cohesion and resilience.

To achieve this objective, 1in1000 focuses on three main areas: i) Long-term metrics; (ii) Risk (management) tools and frameworks; and (iii) Policies & incentives.

The name '1in1000' represents three ideas. First the challenge of dealing with high impact events that are perceived as having a low probability (e.g., financial markets might perceive those risks as one in one thousand type events). Second, the inevitability of these risks and challenges materializing over the long-run. And third, the lack of capacity and resilience of financial markets currently to deliver an adequate response towards those risks.

This is the launch report of the 1in1000 research program and thus outlines its purpose, ideas and vision over the next decade.

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### Funders' information & disclaimer

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# Executive Summary

We live in an era of future challenges and risks threatening the financial sector, economy, and society. Their ascent has begun, visible in the rise of extreme weather events and nascent industrial transformation related to mitigating these events. There is strong evidence that these risks are not meaningfully addressed in today's financial markets and the regulatory frameworks that supervise them.

At the heart of those future challenges and risks is the climate crisis and (inter-)connected risks and challenges, notably ecosystem and biodiversity losses, and the breakdown of social cohesion & resilience. In response to this challenge, the 2° Investing Initiative is launching a new research programme called lin1000 to support financial markets and society more broadly respond to these threats.

The name of the research program speaks to the perceived *low probability* in the short-run of these risks, limiting short-term mitigation and adaptation efforts, the *inevitability* of these risks materializing in the long-run and the related imperative to respond to them, as well as the *lack of capacity* and *resilience* in markets when these risks will materialize.

We focus on the finance sector as an agent that is both exposed to these risks and, through its role in capital intermediation, is also in a crucial position to mitigate and adapt to these risks. The finance sector currently does not respond to these two dynamics as a result of short-termism (“closed eyes”), the complexity and uncertainty of modelling long-term issues, and a lack of incentives to respond to the risks in the short-term. In order to respond to this challenge, the goal of the lin1000 research programme is to:



Open the eyes through the use of **long-term investment metrics**



Provide “glasses” to see and navigate through the complexity and uncertainty of future challenges and risk with the use of **risk (management) frameworks and tools**



Prepare and provide the path to mitigate and adapt to these risks through **regulatory incentives and evolving practice.**

In this report, the lin1000 research programme proposes a roadmap to move towards mitigating and adapting to these risks over the next decade in financial markets, the economy and society. The report addresses four questions and is structured accordingly:

**1**

What are the impacts of major future risks and challenges?

**2**

What role do financial markets play in measuring and mitigating / adapting to these risks?

**3**

What prevents financial markets from doing so?

**4**

What can we do to push for action from the financial markets and financial regulators/supervisors and what is the vision for the way forward?



# 1

## We live in an era of major future challenges and risks threatening the financial sector, economy, and society.

Over the next decade, the probability and materiality of a number of future challenges and risks is set to increase. These risks often have irreversible consequences. Since the magnitude of the risks depends on our actions today, the way we mitigate and adapt towards these risks will dramatically shape the next decade. Among this class of risks, climate change plays a pivotal role. The lin1000 research programme will focus on climate-related risks and two related risks (ecosystem service & biodiversity loss, threats to social cohesion and resilience). Ecosystem and social risks related to climate change are both amplified by climate change, but equally represent their own class of economic and financial risks. Moreover, both risks may amplify climate change through a range of channels (e.g., deforestation, social backlash to climate policies).



**Climate change.** Climate change and our efforts to mitigate and adapt to it is arguably society's biggest challenge over the next decades. The associated industrial and societal transformation will dramatically alter the face of the modern economy.<sup>1</sup>



**Ecosystem services & biodiversity.** Climate change is a key contributor to the decline of ecosystem services and biodiversity, amplified and accompanied by other drivers. Climate change is also amplified by the decline of ecosystem services and biodiversity (e.g. deforestation).<sup>2</sup> While still underexplored in the area of financial risk management, ecosystem services can potentially have dramatic economic, financial, and societal effects.<sup>3,4,5</sup>



**Social cohesion & resilience.** The industrial and social transformation mentioned above will have dramatic distributional effects. Furthermore, societal pressures from climate change will challenge social resilience as populations are forced to move and adjust their lifestyles.<sup>6</sup> Some of these trends may also aggravate climate change through e.g. social backlash to climate policies given unequal distributional effects (“just transition”).<sup>7</sup>

None of these risks are new when considering the long arc of human civilization. For the modern, globally integrated, and industrialized economy however, they represent new types of challenges for “traditional” risks metrics, management systems, and mitigation and adaptation measures.

1 IPCC. (2018). ; 2 UNEP-WCMC. (2020). ; 3 see, e.g., PwC and WWF. (2020); 4 IPCC. (2019). ; 5 The Sustainable Finance Platform. (2020). ; 6 World Bank. (2021). ; 7 Robins, N., & Rydge, J. (2019).

## 1.1. The era of future challenges and risks

The Covid-19 pandemic may have been the first warning shot in an era of “future challenges and risks”. A range of other risks are on the horizon.<sup>8</sup> Among those “mega” or “existential” risks as they are often called, climate change plays a pivotal role. On the environmental side, the climate and the ecosystems it supports forms a symbiosis that is nearing or potentially beyond a “tipping point”.<sup>9</sup> Climate change will also drive social conflicts and threaten social cohesion due to distributional justice issues and physical climate impacts on society.<sup>6</sup>

*At lin1000 we focus on future challenges and risks related to climate change, ecosystem services & biodiversity losses, lack of social cohesion & resilience.*

**The evolution of those risks will depend on our actions today.**

In particular in the area of climate change and its corollary risks, the decisions we make over the next decade will dramatically shape this century, perhaps more so than any other decade. If the finance sector, economy, and society mitigate and adapt to these risks, their materiality can be dramatically curtailed. This applies not just to climate change. The threats to social cohesion arising from climate change and ecosystem loss may also create irreversible damage.<sup>10</sup>

## 1.2. The impact of future challenges and risks

**Future challenges and risks can create issues at various levels of the ecosystem, society, economy, and financial markets.**

**1) Risks to ecosystems and society with non-economic impacts.** The first level is non-economic and non-financial risks to ecosystems. The continuing degradation of the ecology could cause tipping points to be reached, could create feedback loops and may lead to an irreversible destruction of our nature.<sup>11</sup>

While arguably any destruction of ecosystems poses some risk to overall economic well-being, the misuse of an ecosystem that is outside the economic system does not necessarily have a negative economic impact on human wellbeing. While these types of risks are largely ignored both by economic and financial agents, they may be material from an ethical or reputational standpoint. Moreover, while from our current viewpoint certain ecosystems may be outside our “economic” world, we don’t fully understand the linkages and networks that connect all natural and human activity on this planet.

**2) Risks to ecosystems and society with economic impacts.** The destabilization of our ecosystems and society due to climate change has implications for our economic systems.<sup>12,13</sup> These risks could depress economic activity through impacts on global supply chains, destruction of infrastructure and demand for products & services.<sup>14</sup> Furthermore, future risks could manifest as impacts on human health, energy, food and water supplies to name a few areas. The associated economic risks may reduce financial productivity but don’t necessarily represent financial risks if this effect is continuously priced by financial markets.

**3) Misallocation of finance due to dysfunctional price mechanisms.** The third avenue creates a mechanism where mispricing in financial markets leads to value destruction when risks materialize.<sup>15</sup> Mispricing of the risks means that capital isn’t deployed “at its most productive use” and that when the risks materialize, individual financial institutions will see their capital and lending capabilities weakened.<sup>16</sup> Mispricing does not automatically drive financial instabilities if the effect is contained.

**4) Financial instabilities.** If the risk is sufficiently material and “systemic”, it may contribute to the (partial) collapse of the financial system through defaults of systemically important financial institutions or more broadly through mechanisms that lead to a freezing up of financing and investment.<sup>14</sup> Financial stability is likely affected where capital is destroyed at a systemic level.<sup>15</sup>

<sup>8</sup> Thomä, J., & Schönauer, A. (2021).

<sup>9</sup> O. Hoegh-Guldberg, D. Jacob et al. (2018).

<sup>10</sup> Conversi, D. (2020).

<sup>11</sup> Malhi, Y., Franklin, J., et al. (2020).

<sup>12</sup> Wade, K., & Jennings, M. (2016).

<sup>13</sup> Schönauer, A., Thomä, J., et al. (2021).

<sup>14</sup> NGFS. (2019).

<sup>15</sup> Nikolaidi (2017).

<sup>16</sup> Thomä, J. & Chenet, H. (2016).

### 1.3. A risk apart

While the finance sector is used to dealing with “traditional” risks such as trade conflicts or the vagaries of business cycles, they are not well-equipped to deal with future risks and challenges.

Climate change, ecosystem service & biodiversity, and social risks all share features that situate them as a “risk apart” from these “traditional” risks. Current risk management systems are poorly adapted to manage these risks.

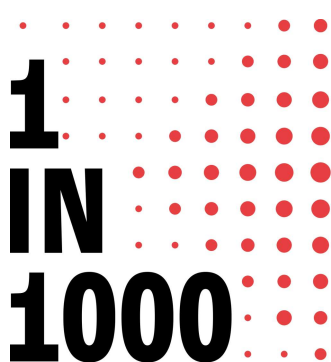
- **Mitigation & adaptation timelines.** All three risks require early mitigation and adaptation actions long before the risks materialize (decades in the case of climate change).<sup>14</sup> These types of timelines are not well suited to typical risk mitigation measures that usually come to fruition in the span of months or at most a few years.
- **Not suitable for mainstream risk models and management systems.** In the same vein, current risk management systems with their short-term time horizons, their use of normal distributions, traditional data systems, and “short memory” are not well equipped to capture the ascent and materiality of these risks.<sup>17</sup>

### 1.4. The concept of 1in1000

The concept of 1in1000 is best described through the following terms:

- 1) **Perceived as low probability.** 1in1000 expresses the idea that future challenges and risks are perceived, especially by financial markets, as events whose probability is very low in the short-run.
- 2) **Uncertain but inevitable impacts.** 1in1000 puts emphasis on the fact that while future challenges are uncertain, they are in some form inevitable to materialize unless mitigation or adaptation actions are taken – and even then may be unavoidable to some degree.
- 3) **Lack of capacity and preparedness.** 1in1000 risks meet a world that is chronically underprepared in its response and lacks the resilience and spare capacity necessary to meet these risks. We are doing “1 of the 1000 things” necessary to meet the challenge.

Figure 1: Summary of the concept of 1in1000 (Source: own representation).



**Perceived as a low probability.**

A perception that there is only a low chance of the risks happening in the short-term (e.g. “1 in 1000”) – the financial sector ignores climate-related future challenges and risks.

**Uncertain but inevitable.**

The “1” in “1 in 1000” highlights the inevitability of the event happening in the long-run, reinforcing the need for action today.

**Lack of capacity and preparedness.**

We only do “1” of the “1000” actions necessary to build the resilience to these future challenges and risks.

<sup>17</sup> Naqvi, M., Burke, B., Hector, S., Jamison, T., & Dupre, S. (2017).

## The financial sector is both exposed to these future challenges and risks and can help reduce them.

Financial markets play an important role in the era of future challenges and risks. First, financial markets are exposed to these risks and thus, are impacted by them. Materialization of these risks may engender financial instabilities and crises, with consequences for the economy and society. On the other hand, the financial sector can also contribute to the reduction of the risks and thus can control, to a certain extent, the impact and magnitude of the risks.



**Exposure of the financial sector:** Financial markets are exposed to future risks and challenges as those risks manifest themselves in either physical, mitigation / transition, or litigation risks.<sup>18</sup> Such manifestation of those risks can lead to economic disruption that affects businesses and reduces profits. Such disruption can, in turn, lead to financial risks, such as when counterparties begin to default on loans (credit risks), or when market prices respond to changes in fundamental (market risks). If these risks are systemic, they can also lead to financial instability.



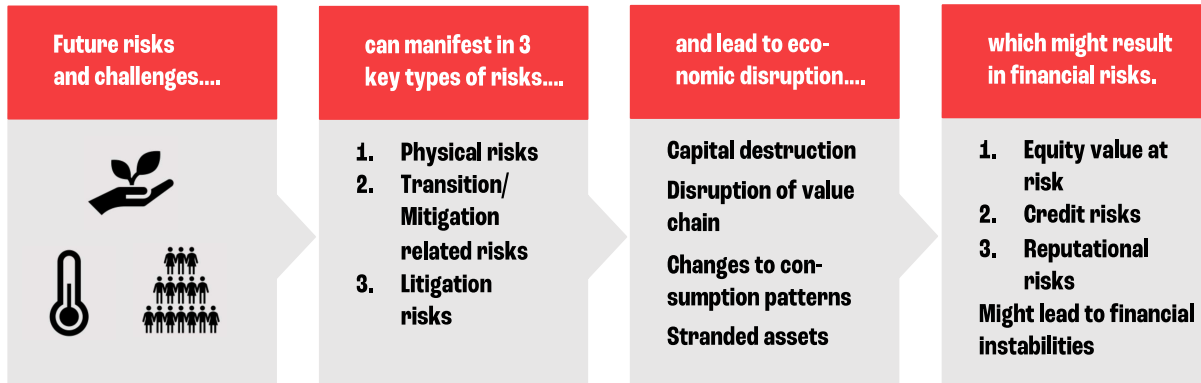
**Mitigating/adapting to the risks through the finance sector:** While financial markets are exposed to future risks, they can also reduce those risks. Financial markets can increase resilience by ensuring they are prepared as institutions for any kind of risks by increasing buffers in their daily business. Second, financial markets can reduce the risks themselves by financing mitigation and adaptation measures. Third, financial markets can act more broadly for the public good and drive changes to reduce the risks for society beyond their own risk exposures, taking a systemic view.

<sup>18</sup> Financial Stability Board. (2020).



## 2.1 The financial sector is exposed to future challenges and risk

Figure 2: Future threats and their risks for the financial sector (Source: own representation).



There are three key types of risk categories through which future risks and challenges will materialize: 1) physical risks – the risks of the physical impact on economy and society; 2) transition/mitigation risks – the risks of governments and policymakers introducing policies or regulations, but also the risks stemming from technological breakthroughs and changes to consumption patterns; and 3) litigation risks – the risks related to legal actions in response to violations of contracts, norms, or laws, etc.<sup>12,18</sup>

These risks may translate into risks to financial market actors, which will both impact their ability to muster a strong financial response and may lead to financial instability that may amplify the ‘original’ risk.



## 2.2 On the other the hand, the financial sector can help reduce the risk

On the other hand, financial markets have a unique opportunity to support societies and the economy in mitigating and adapting to these risks. This opportunity operates at three levels:

Figure 3: Three ways how the financial sector can reduce the risks (Source: own representation).

01

The current COVID-19 pandemic has highlighted the importance of resilience and spare capacity for crises. Capital requirements, corporate capital buffers, and related ‘spare capacity’ measures in the investment and lending process can act as mechanisms to ensure resilience to the next crisis.

**Be resilient – reduce the impact of the risk on the balance sheet**

02

The financial sector also plays an important role in financing mitigation and adaptation measures. Instead of pulling out their money from investment that is most exposed to certain risks, investors could remain and engage with their investment, e.g. by offering capital for adaptation and mitigation<sup>20</sup> – reducing the risk for itself.

**Invest in adaptation and mitigation measure – reduce investment and lending risk**

03

The financial sector can also become a good corporate citizen by driving change. The financial sector can thus look beyond its own risk profile to contribute to real world impact and systemic change, as well as realizing its ‘corporate’ responsibility e.g. in the area of the “just transition” and biodiversity.

**Be a good corporate citizen – reduce the risk for society**

<sup>19</sup> University of Cambridge Institute for Sustainability Leadership. (2021).  
<sup>20</sup> UNEP (2021).

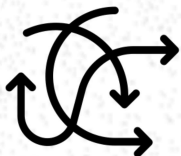


## The landscape of metrics, institutions, and policy in financial markets does not address this class of future challenges and risks.

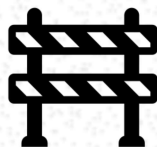
Financial markets today don't take the steps necessary to respond to the class of risks outlined above. Three key challenges act as barriers to financial market actions.



**Financial institutions have their eyes closed.** While the time horizons on the asset and liability side in the investment process may be long-term, the investment process itself artificially shortens these horizons. The time horizon of fund managers typically is limited to 3 years. The time horizon of financial analysts tends to end at 5 years at best and macro and micro-prudential regulations tends to have a similarly short-term focus. Future risks either materialise beyond those time horizons, or expressed differently, have too low of a probability in the short-term to factor into decision-making. In other words, financial markets close their eyes towards those future challenges and risks.



**When they open their eyes, they cannot understand.** Even if financial institutions want to understand future challenges, it is very difficult to do so. The reasons relate to the complexity involved with future risks, e.g. they tend to be fat tailed risks with no historical precedents, uncertain tipping-points and non-linear dynamics. Traditional risk metrics struggle to deal with those characteristics. These issues are amplified by the uncertainty of the 'response' to these risks.



**Even if financial institutions see, they have limited incentive to act.** There is uncertainty about when future risks will occur, although their impact is set to be dramatic. Being prepared for the consequences of these future risks requires precautionary measures. Unfortunately, financial institutions have limited incentives to pursue meaningful precautionary measures today. Despite the growth of ESG and climate commitments over the past years, the core dynamic of finance remains largely the same. Incentives to act can be driven by policymakers and financial regulators redefining incentives, by the market through pricing mechanisms, e.g. by retail investors pressuring financial institutions to act, and / or by civil society moving financial institutions to do the "right" thing.



## 3.1 Financial institutions' eyes are closed

### 3.1.1. The time horizon of future challenges and risks

Typically, we distinguish between two types of time horizons related to the risks described in Section 1, both of which do not lend themselves to short-term processes:

- **Slow-building risks** are risks whose probability of impact increases and which might also get more severe over time. Examples are ecosystem losses or climate change. Those future risk and challenges will be mainly material in the long-term (2030-2050 and beyond), even if catastrophic events (e.g. Hurricane Catarina) may materialise today.<sup>21,22</sup>
- **Point-in-time risks** are risks that have a high probability of materializing at some point in time, but negligible probability of happening at any point in time. Examples are pandemics or sudden climate events and related policy responses.<sup>21,22</sup>

### 3.1.2. The time horizon of financial agents

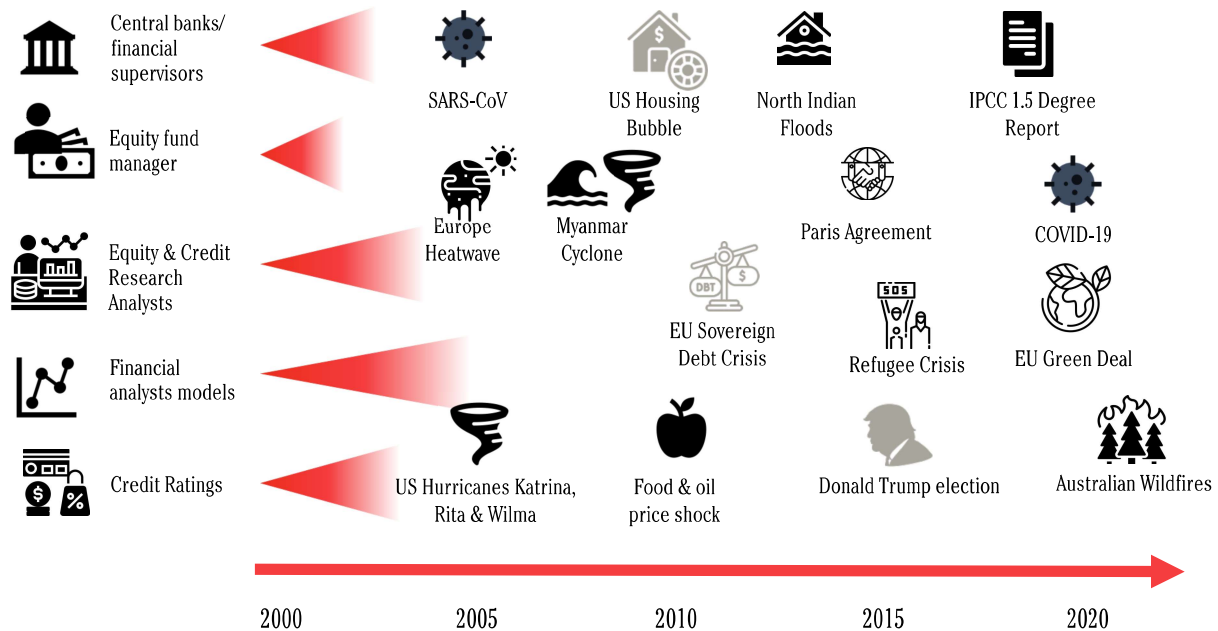
There isn't a straight answer as to the time horizon underpinning financial decision-making today. While investors describe themselves as long-term, most empirical analysis of decision-making in the investment process (e.g. credit / equity research, portfolio mandates, turnover) suggest in practice a short-term investment process of 1-3 years. This stands in marked contrast both to the long-term liabilities and assets that this investment process is designed to intermediate.

Long-term climate targets (e.g. 2050 Net Zero Commitments) may help to overcome some of this myopia, as does the rise of scenario analysis over longer time horizons. At the same time, regulatory frameworks of central banks and supervisors will still more often than not steer towards the short-term.

### 3.1.3 Why the time horizon of financial agents hides future risks and challenges

The image below illustrates how financial agents, at the turn of the 21st century, would have been limited by their time horizons to account for risks which materialised in the last two decades. We are now facing a similar dynamic where both slow-building and point in time risks are not likely to be 'seen' as part of short-term investment horizons and when they do materialize (e.g. energy transition), mitigation and adaptation efforts are both delayed, perhaps insufficient, and likely more disruptive.

**Figure 4: The restricted time horizon of financial agents and the significant risks and challenges between 2000-2020 (Source: own representation).**



<sup>21</sup> Thomä, J. & Dupre, S. (2014).  
<sup>22</sup> Dupre, S., & Chenet, H. (2012).



## 3.2. When financial institution open their eyes, they can't see

### 3.2.1. The nature of the risks makes it difficult to predict and to understand

Even when financial institutions expand their time horizon, the complexity and uncertainty of future challenges and risks make them difficult to capture and understand. These challenges include, but are not limited to:

**Limited historical precedents:** Standard models normally rely on historical data to predict future events.<sup>23</sup> The problem of future challenges and risks are that they lie, as its name says, in the future. For most of the events, the availability of historical data is lacking or very limited for the time horizons typically under review by risk analysts.

**The risks are fat-tailed:** The impact of the future risk events and their probability is not normally distributed, given both their non-symmetrical outcomes and the potential “fat tails” related to high impact events.<sup>14,17</sup> Many traditional risk models are not well equipped to capture these types of distributions.<sup>17</sup>

**Risk in complex systems:** The risk drivers are characterised by non-linear dynamics. There are tipping points and the sensitivity to initial conditions is high. Examples include the disintegration of Greenland ice sheets that might lead up to 7m sea level rise.<sup>24</sup>

### 3.2.2. Feedback loops amplify the magnitude of the risks and their unpredictability

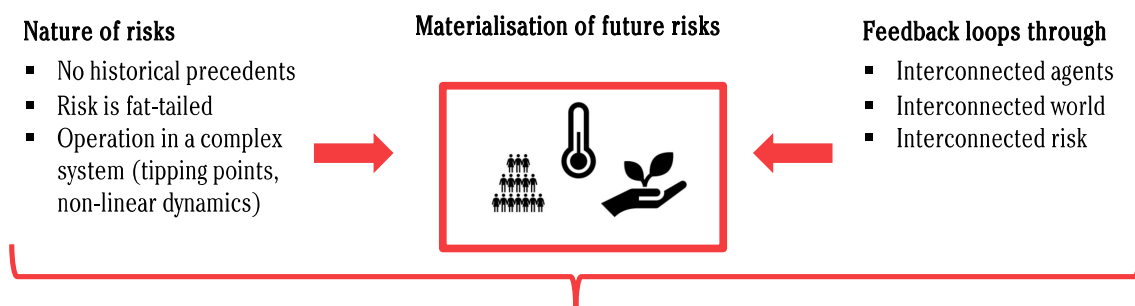
The magnitude of the risks also depends on feedback loops and amplifiers, increasing the uncertainty that the risks surrounds. Three key aspects lead to such feedback loops:

**Interconnected agents:** Feedback loops occur through the interconnectedness of agents' decision.<sup>25</sup> For example, if a significant global bank incorporates extreme weather events in their decisions, they might pull their money out of the most exposed investment.<sup>26</sup> One result could be that those projects most exposed to climate change might have even less money to invest in adaptation or mitigation policies, exacerbating the risk in the first place.

**Interconnected world:** The interconnectedness of the world through global value chains also might lead to feedback loops. Disruption in the value chains will create varied direct and indirect impacts across stakeholders, depending on their exposure and dependence. The trickledown effect of a future risk in one country can thus also impact other regions of the world making the understanding of the extent of the risk more difficult.

**Interconnected risks:** Climate change, biodiversity loss and social breakdowns are highly interlinked. Such interlinkages can lead to a greater potential collective effect than the sum of its parts.<sup>27,28</sup> In other words, the risk can turn into a compounding risk that is very difficult to understand and to measure.

**Figure 7: The complexity of future threats making it difficult to understand them (Source: own representation).**



The nature of the risks but also the reactions and effects within a interconnected complex economic and financial system surround the risks with uncertainty, which makes it hard to understand the magnitude and impact of such risks.

<sup>23</sup> Ouliaris, S. (2020).

<sup>24</sup> Boers, N. & Rypdal, M. (2021).

<sup>25</sup> Dafermos (forthcoming).

<sup>26</sup> Buhr, B., Donovan, et al. (2018).

<sup>27</sup> Driscoll, D.A., Felton, A. et al (2011).

<sup>28</sup> Ding, H., & Nunes, P. A. (2014).



### 3.3. When financial institutions see, they do not have the incentive to act

#### 3.3.1. The three incentives of financial institutions to act.

There are three different agents that can drive financial institutions' action:

**Market:** Price mechanisms are a key driver of change. There are indirect and direct factors that can be fed into the price mechanism. Supply and demand are e.g. direct factors. For example, the demand/pressure of retail investors can make financial institutions incorporate mitigation and adaptation policies in their practices. Indirect factors could be, for example, specific non-price market trends, forcing financial institution 'to go with the trend' like the focus on ESG.

**Policy:** Financial institutions can be forced to act through regulation/policies, which may create a legal obligation to shift private financial markets towards incorporating these future risks and enforce a focus on adaptation and mitigation measures.

**Public:** Furthermore, civil society as the public can put pressure on financial institutions in the same way as retail investors through taking financial institutions to court or by damaging their public image and brand.

#### 3.3.2. Why those incentives are not sufficient.

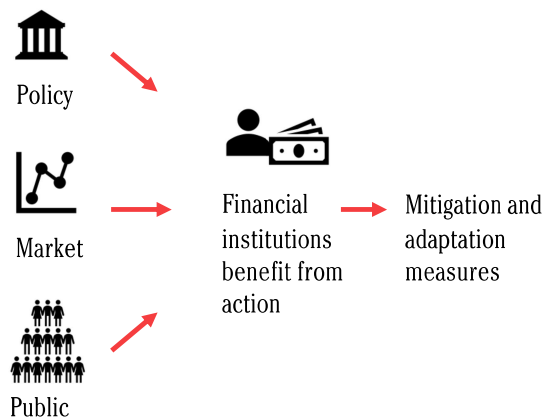
Each of the three ways to set incentives are lacking effectiveness today:

**Market:** Despite the growth of ESG and sustainability as an issue in financial markets,<sup>29</sup> the scale and scope of future challenges and risks are not meaningfully translated into financial decisions yet. Neither market prices nor financing volumes, as well as the underlying risk management sophistication related to future risks suggest that market forces currently are sufficiently material to drive future risk integration. Similarly, the misalignment between retail investors preferences (both asset allocation and voting<sup>30</sup>) suggests that this mechanism still does not function as intended.

**Policy:** Governments and central banks responded to the current Covid-19 crisis with the biggest bailouts and provision of liquidity in history.<sup>31</sup> Whereas this suggests that response mechanisms of governments and central banks to crises might be in place, prevention and preparedness measures are lacking. There are many examples on how policymaking could set incentives to fund mitigation or adaptation measures, such as tax incentives, regulations, disclosure activities. While some of these regulatory actions have been initiated, their overall deployment requires significant upscaling and more relevant targeting.

**Public:** The public can create pressure on financial institutions to act through various measures (e.g., after Fukushima, when public fear of a nuclear catastrophe pushed German politicians to phase out nuclear power generation). However, understanding the scope of these risks can be constrained in the general public due to cognitive and behavioural barriers in psychology and society.<sup>32</sup> Moreover, there are inherent limitations to the public impact when market and regulatory forces don't move in tandem.

Figure 5: The three incentives to act (Source: own representation).



<sup>29</sup> European Parliament & Council of the European Union. (2019).

<sup>30</sup> Dupre, S., Bayer, C., & Santacruz, T. (2020).

<sup>31</sup> IMF. (2021).

<sup>32</sup> Norgaard, K. M. (2009).

# 4

## The lin1000 programme will develop long-term metrics, risk (management) tools and frameworks, and drive the incentives to act upon the risks

lin1000 is a new research program by 2° Investing Initiative that brings together new & existing research projects on long-termism, climate change, and associated future risks for financial markets, the economy, and society. Its objective is to develop evidence, design tools, and build capacity to help financial institutions and supervisors to mitigate and adapt to future risks and challenges. The research programme consists of three key areas of research:



**Area 1: Long-term metrics.** A critical challenge and barrier to understanding, mitigating, and adapting to climate change, ecosystem services & biodiversity, and social cohesion & resilience risks is the short-term focus of financial markets. This insight is not new. Our approach to fixing this issue will be to answer a ‘simple’ question – ‘what are the metrics and criteria to define a long-term investor and a long-term bank?’ By developing these performance metrics, we will seek to ‘put glasses on the financial sector’ to better visualize future risks and challenges, but also to better understand the extent to which long-term processes drive both financial (risk) and sustainability performance.



**Area 2: Risk (management) tools and frameworks:** Even with glasses, integrating future risks is difficult, given their complexity and uncertainty. The second area will seek to develop new types of risk models, metrics, and measurement approaches to address this challenge, building on the experience of portfolio alignment metrics (PACTA) developed over the past 8 years. The risk management tools are centred around the idea of preventing, preparing and responding/rebuilding better when the risks materialise. Examples here are stress-tests, monitoring systems and auditing systems that assesses the risk management of financial institutions.



**Area 3: Policy & Incentives.** The third area focuses on supporting the financial sector and the economy in mitigating and adapting future risks and challenges. This area involves changing public and private sector practice on integrating long-term investor and risk metrics. In parallel, the lin1000 research programme will focus on policymakers, central banks, and financial supervisors in order to leverage policy and regulatory frameworks to align financial market participants’ incentives with long-term risk management & risk mitigation/adaptation objectives.





## 4.1. Area 1: Long-term investing metrics

### What is Area 1 about?

We know that the current landscape of “performance metrics” incentivizes short-termism across everything from investment benchmarks, remuneration, reporting frameworks, as well as the capacity and training that underpins these practices. This, however, needs to change if we want financial institutions to put the glasses on and to consider future risks and challenges.

### Why is it a problem?

The lack of performance metrics and criteria creates three issues

- **Lack of utility for marketing.** The lack of criteria and benchmarks on what it means to be a long-term investor means that the term only has limited utility as a way to profile an organization. Because every organization can call themselves long-term, (almost) every organization does.
- **Lack of dynamic around long-term risk integration.** Without reference points, there is limited incentive to ‘upgrade’ in the context of integrating long-term investment considerations, in particular in the context of long-term risks.
- **Lack of ability to identify areas of improvement.** Without standards, there is very little capacity for asset managers and asset owners to benchmark their own performance.

### How do we want to address the problem?

**Defining the term “long-term” investor and long-term bank.** The representation that a financial institution is a long-term investor is proliferating in the investment industry. A review of marketing materials of major asset managers and asset owners shows that almost all institutions label themselves as “long-term investors”. The 20 largest asset managers alone use the term over 7,000 times on their website. Despite this prominence, the actual understanding of what it means to be a long-term investor is limited. There is no benchmark or minimum criteria. Some online definitions simply define long-term investing as ‘any investments with a time horizon of more than one year’. In this context, a vacuum exists where one of the most fundamental terms as to how investment management organizations define themselves – as ‘long-term investors’ – is not defined. It is clear we need better performance metrics, but there isn’t clarity on what these are, what values they should take, and how they can complement and/or enhance existing practices. While we plan to start with the investment management space, over time we’ll seek to expand our work to the banking sector.

**Identifying performance drivers.** The second component involves understanding the extent to which long-term performance criteria drive financial and sustainability performance, as well as risk management quality more broadly.

**Figure 6: Frequency of references to “long-term investor” and “long-term investment” across 20 large asset managers (Source: own representation).**





## 4.2. Area 2: Risk (management) tools and frameworks

### What is Area 2 about?

We need tools and frameworks that first help to measure and understand the risks as such but also to manage the risks so that we can prevent, prepare and respond to the risks effectively. Area 2 will be the glasses to help us see the future.

### Why is it a problem?

As outlined above, risks arising from climate change, loss in ecosystem services & biodiversity, as well as a lack of social cohesion & resilience constitute a class of risks that are not well captured in current risk management frameworks.

Overcoming this risk metrics gap requires both the development of risk scenarios and models that capture these risks, as well research in challenging and enhancing the underlying risk management approach. It also requires an understanding of the potential capacity issues and transaction costs of introducing new risk modelling approaches and the exploration of new types of risk metrics and representations.

**Figure 7: Ideas at one glance (Source: own representation).**

lin1000 focus in area 2	Example projects
New risk scenarios	Covid-19 with Metabiota
New metrics & stress models	Stress-test modelling Quantifying corporate climate costs & responsibilities
Monitoring & auditing systems	Monitoring to assess green recovery measures with COVID-19

### How do we want to address the problem?

**New risk scenarios & value drivers.** The lin1000 research program will build on the existing climate stress-test programme of 2DII to develop scenarios and value drivers for climate, ecosystem services & biodiversity, and social resilience & cohesion that can be integrated into valuation and credit risk models. The lin1000 programme will also maintain its commitment to supporting its pandemic related research around Covid-19 and beyond, a commitment triggered at the start of the pandemic. While we recognize that the link between pandemics and climate change is less strong, we see Covid-19 as a crucial reference point for understanding both risk responses and transmission channels.

**New types of tools & stress-test models.** In addition to developing new risk scenarios & value drivers, the lin1000 programme will also expand its development of risk metrics & stress-test models. This work will focus in particular on the climate and ecosystem service scenario analysis & stress-test partnerships developed with around a dozen major financial supervisors and central banks around the world over the past few years. Developing new stress-test concepts and scenarios is crucial to allow traditional tools like stress-tests to capture new types of risks. It will also extend to challenging our thinking on new types of metrics and the expression of risk in alternative forms and indicators (e.g. quantifying corporate climate costs & responsibilities), building on the experience of developing new indicator concepts as part of our climate alignment metrics development and PACTA.

**Monitoring & auditing systems.** The third component involves mechanisms and metrics to audit risk management and risk supervision practices and to monitor risk materiality. For example, in the light of the current Covid-19 crisis, we built a monitoring system that assess the green recovery measures to rebuild back better after the risk materialised. Furthermore, audit systems are important to understand gaps in risk management processes.



## 4.3. Area 3: Policy & Incentives

### What is Area 3 about?

The lin1000 research programme strategy mirrors the original concept underpinning the creation of the 2° Investing Initiative. Metrics are at the heart of change, but without incentives to use them, no change will be possible.

Focusing on the “action” (Area 3) in equal terms to the “metrics”, “tools” and “frameworks” (Area 1 & Area 2) underpinning these actions is an important part, if not the most important part, of the lin1000 concept. There are two components to the area – the first one looks at the integration of our metrics into private sector practice. The second one focuses on policy incentives and regulatory frameworks.

### Why is it a problem?

Integrating new metrics, tools, and approaches requires the right incentives frameworks. This involves understanding and building evidence for the benefits of these metrics, but also understanding the transaction costs and institutional and behavioural barriers to scaling these metrics.

Of course, incentives are dominated by the regulatory framework that sets the “rules of the game”. Understanding and engaging that framework to drive the integration of future risks and challenges in lending and investment decisions is thus a key area of the lin1000 strategy.

### How do we want to address the problem?

**1) Integration of metrics, tools and frameworks.** Partnerships with financial institutions are a critical part of our strategy, building on our experience in scaling PACTA. Those partnerships help us to enhance our metrics, road-test concepts, receive valuable feedback and to find solutions that fit not only the purpose for society but which also align with the decision-making frameworks of private sector actors. They extend to co-designing research, supporting (as a non-commercial partner) the development of commercial solutions building on our research and thus ensuring the sustainability of our ideas.

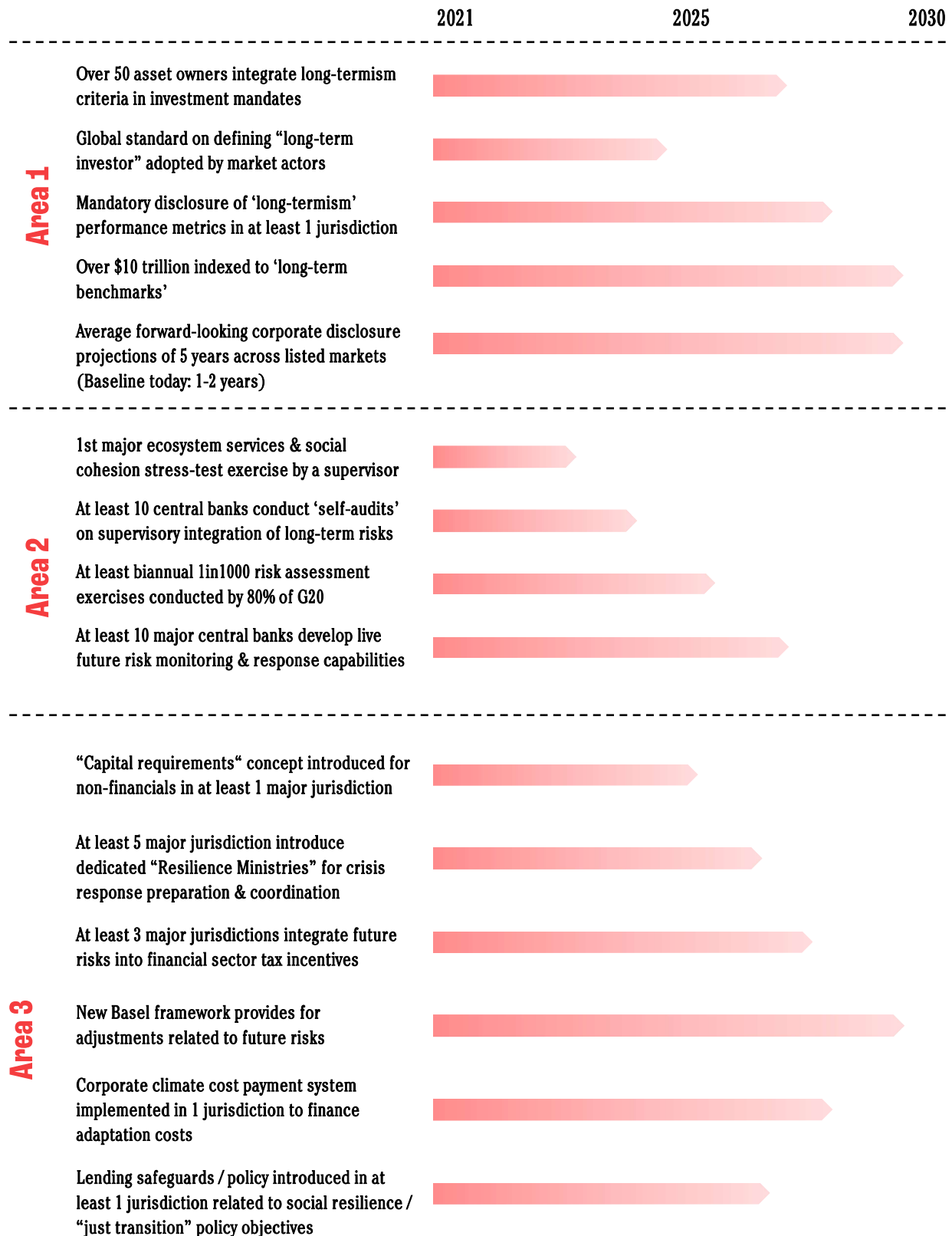
**2) Policy incentives & regulatory frameworks.** The second component of Area 3 is the policy and regulatory frameworks that creates and influences private sector incentives and the rules of the game. Of particular interest are the following areas:

- **Financial sector tax & burden-sharing policies.** One of the most prominent incentive mechanisms in the policy toolbox are the tax regimes and the burden-sharing or distributional effects that come with these. For example, recent research by the lin1000 research programme has revealed a range of potential financial sector tax measures that could be utilized to support resilience measures and risk mitigation related to climate risks.<sup>33</sup>
- **Long-term financial supervision.** As outlined in a paper co-published with Oxford University in February 2021, financial supervision and central banking frameworks are still largely short-term, mirroring the institutions they supervise.<sup>13</sup> Without long-term supervision frameworks beyond the business cycle, it will be difficult to expand the time horizon of the banks, insurance companies, asset managers, and pension funds - those institutions that are supervised. This extends to all areas of financial sector practice that may be described as the “rules of the game”.
- **Policy impact & green recovery.** The third key focus is improving our understanding of the policy impact of risk management policies, in particular as it relates to “recovery measures” following the inevitable materialization of (some) of these risks.

<sup>33</sup> Thomä, J., & Schönauer, A. (2021, March).



## 4.4. Roadmap to 2030



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