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Pension Systems + Climate Risk : Measurement + Mitigation

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Your willingness to participate in our research has furthered our understanding of how climate risk will impact the financial system and we are hopeful that it will advance future climate finance solutions.

In completion of the Columbia SIPA capstone requirement

Supervised by Cary Krosinky and Thomas Murtha. Authored by Pauline Deschryver, Patrick Dougherty, Jumi Kim, Laura Kunstler-Brooks, Jiaru Qin, Jing Wu, Shan Wu, and Bingjie Zhou.

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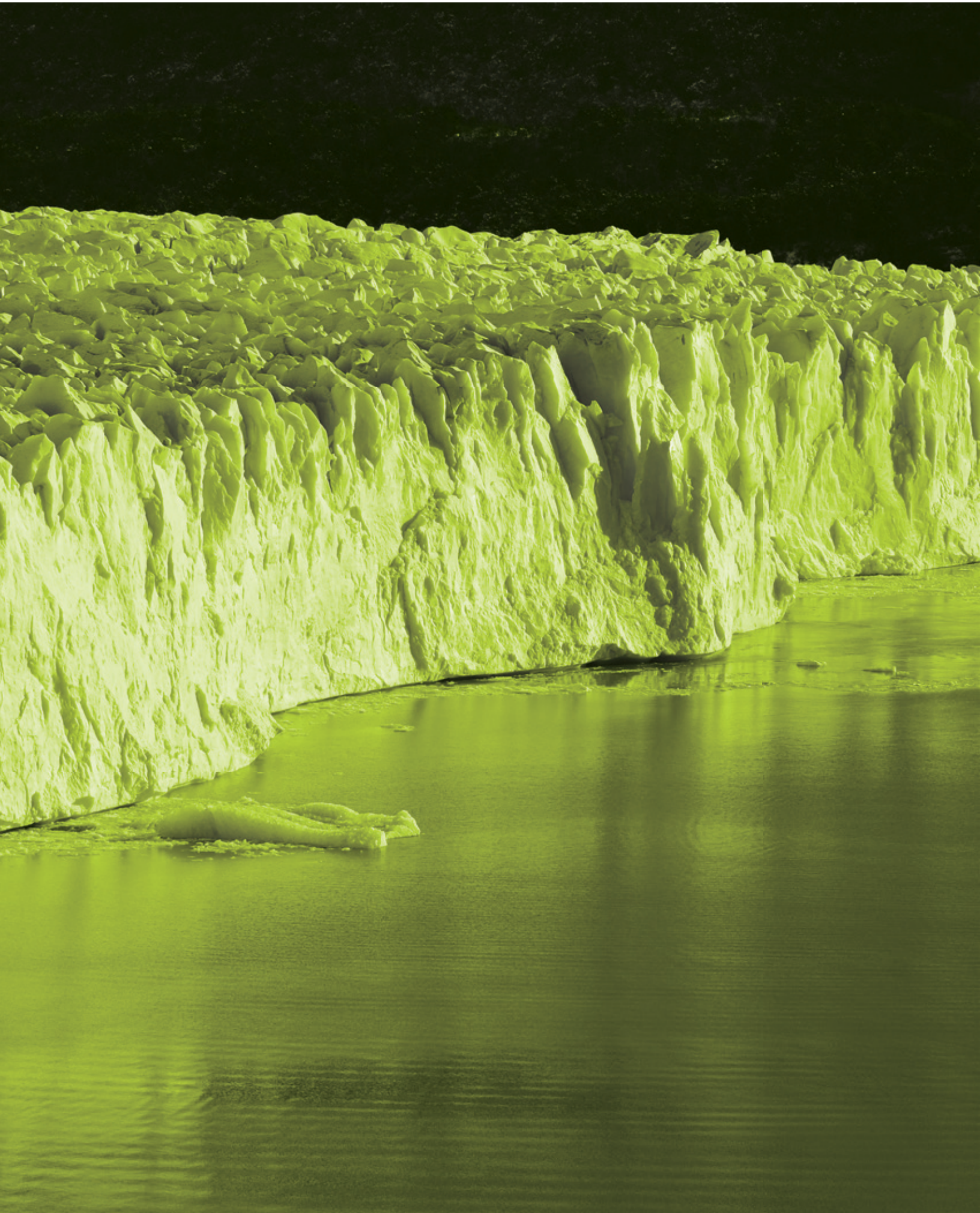

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Executive Summary

Pension funds can potentially play a critical role in combating climate change by providing much needed financing and investment. Intervention is necessary to bridge the financing gap of between $1.6 trillion to $3.8 trillion in mitigation costs and $180 billion in adaptation costs to limit global temperature rise and ecosystem collapse.[1] Institutional investors such as pension funds have two motivations to providing such financing. On the other hand, if the investor community does not act, they face a potential portfolio value loss of $10.7 trillion triggered by the materialization of transition, physical and regulatory risks. On the other hand, the transition to a 2oC scenario is expected to yield $2.1 trillion in global "green" investment opportunities for investors.[2]

This report focuses on pension system greening and aims to provide data-driven recommendations to orient climate-aligned investment practices. In order to undertake a holistic analysis, this report consists of the following sections: a literature review outlining the need to green the global pension system (Section 1); a review of relevant national and international actions taken (Section 2); a climate risk exposure landscape based on quantitative analysis deriving country pension fund climate risk scores (Section 3); a complementary regulatory mapping and score that uses a combined quantitative and qualitative approach (Section 4.1); and a survey of pension regulators to identify how each supervisory authority is interpreting practices and standards on ESG integration in the pension industry (Section 4.2). The final section of the report summarizes the conclusions and key policy recommendations. In addition, this report relies on insights from a series of case studies conducted, which profile several leading pension funds and their climate investment strategies (appendix 1).

While all pension systems will face material risks resulting from climate change, some pension systems will be more vulnerable than others. To identify such risks and challenges of climate change, an in-depth data review and quantitative analysis was undertaken to create the Pension Climate Risk Heatmap for 71 countries. The derived pension climate risk measure was a composite measure based on data from the *Notre Dame Global Adaptation Index*, pension asset-to-GDP ratio, and percentage of pension assets held domestically. This approach allowed for an estimation of potential pension fund exposure to climate change risk, accounting for the relative fund size of pension fund assets in each country and the level of portfolio diversification internationally. Overall, the analysis indicates that pension funds are vulnerable to climate risk in varying degrees and forms.

1. Barbara Buchner et al., "Global Landscape of Climate Finance 2019" (Climate Policy Initiative, November 2019), https://climatepolicyinitiative.org/wp-content/uploads/2019/11/2019-Global-Landscape-of-Climate-Finance.pdf.
2. Beate Antonich, "Institutional Finance Update: Investors' Decisions Impact Climate Change, and Climate Risks Impact Their Portfolios," May 30, 2019, http://sdg.iisd.org/news/institutional-finance-update-investors-decisions-impact-climate-change-and-climate-risks-impact-their-portfolios/.

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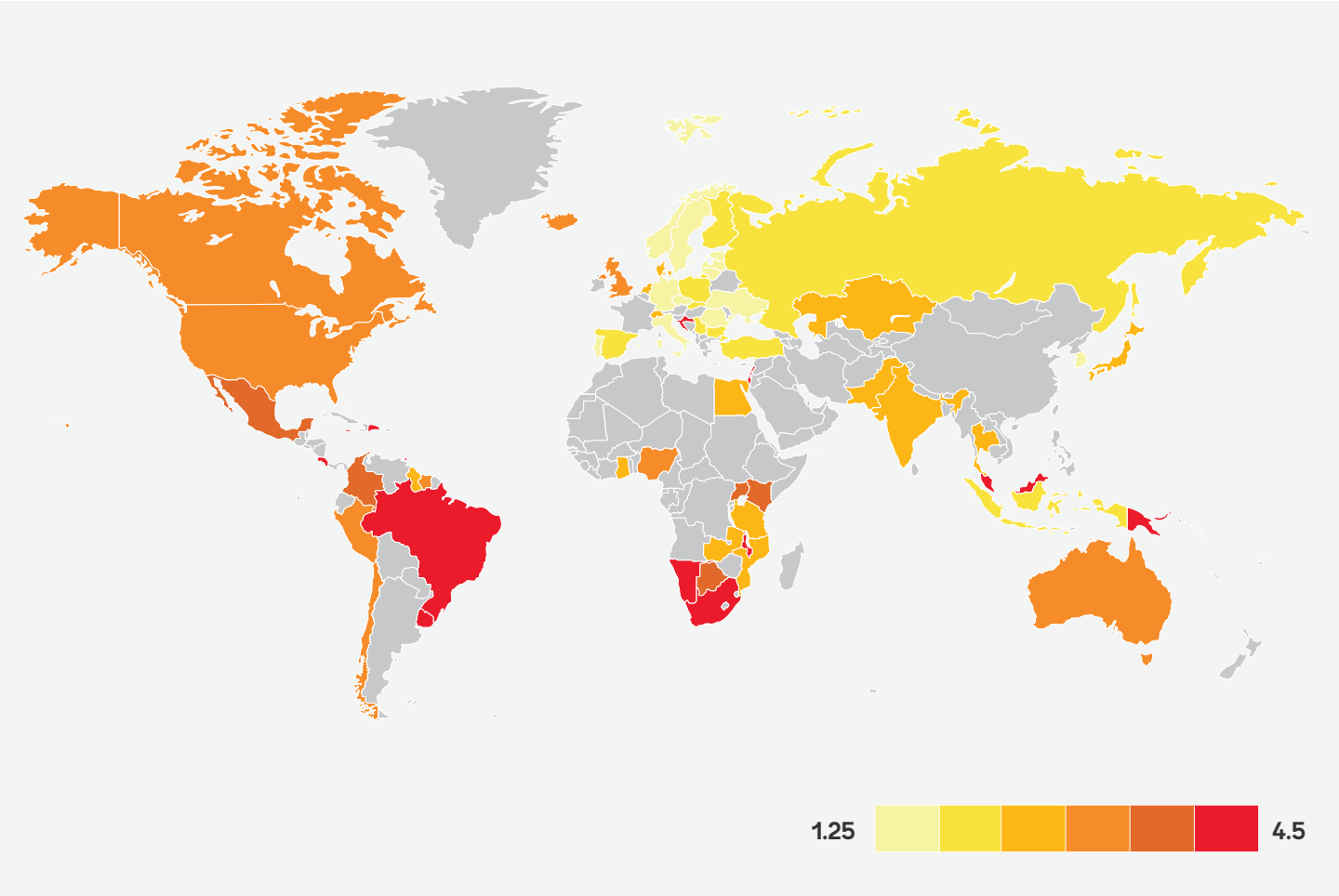
FIGURE 1 - Country Pension Climate Risk Heatmap



An important counterpart to the Pension Climate Risk Heatmap is the regulatory environment in which pension funds operate. A follow up question was therefore posed as to whether the necessary regulatory measures are being put in place by countries which could help mitigate this climate risk. Using an in-depth quantitative and qualitative approach, ESG pension regulations of 50 countries were mapped and scored with the aim of outlining potential regulatory enablers of sustainable investment. This review was complemented by a survey administered to members of the International Organisation of Pension Supervisors (IOPS), which provided further details on their ESG regulatory approach.

These Regulatory scores were combined with the pension climate risk scores to sort countries into four main groups. These comprise pension systems with low climate vulnerability and low regulatory risk, those with low climate vulnerability but medium to high regulatory risk, countries with high climate vulnerability and low regulatory risk, and finally those with high climate vulnerability and medium to high regulatory risk.

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FIGURE 2 - Comparing climate risk and regulatory risk scores

The final section of the report concludes that pension funds play a critical role in the transition to a low-carbon climate resilient economy. In the context of rising risks and opportunities posed by climate change, pension funds have to reinvent themselves to comply with their global presence and a definition of fiduciary duty aligned with today's challenges. Based on the analysis undertaken, recommendations for regulators and pension funds alike are to:

- **Review investment guidelines to allow for appropriate levels of international diversification.** *Regulators should review pension fund investment guidelines to check that they do not inadvertently exposure pension funds to high levels of domestic climate risk.*
- **Adopt a holistic definition of fiduciary duty, fully aligned with today's challenges.** *Policy makes should revisit pension funds' definition of fiduciary duty, in line with financial, environmental, social and good governance imperatives to ensure that climate risks can be taken into account.*
- **Build ESG literacy and awareness.** *Regulators should develop their own knowledge and measurement of climate and other ESG risks and offer and promote educational tools and incentives to allow pension funds to develop a robust internal expertise on climate and other ESG-related considerations.*
- **Share and adopt best practices.** *Pension supervisory authorities could take a common stance on sustainable finance practices, including ESG disclosure and reporting, including through the regulatory framework led by the IOPS. Further support is also required to help regulators adopt international standards and good practices in a proportionate and appropriate manner, reflecting the nature of their local market and pension systems and – as this study has shown – the potential level of climate risk faced.*

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Pension Climate Action to Date

Institutional investors are an important potential source of financing for the investment which will be needed to meet global climate goals. The World Economic Forum estimates that approximately $44 trillion of economic value generation is moderately or highly dependent on nature and its services.[3] To prevent complete ecosystem collapse, the world must limit global temperature rise to 1.5°C. Reaching this scenario is estimated to require between $1.6 trillion to $3.8 trillion in mitigation costs and $180 billion in adaptation costs. In 2018, climate finance flows fell far below that number at $542 billion, 93 percent of which went to mitigation activities and five percent to adaptation activities.[4] Institutional investors, with total assets under management amounting to approximately $84 trillion, could play an important role as sources of global capital.[5]

Institutional investors such as pension funds have two motivations to providing such financing. On the other hand, if the investor community does not act to finance mitigation, it could face a potential portfolio value loss of $10.7 trillion triggered by the materialization of transition, physical and regulatory risks. On the other hand, a 2C scenario is expected to yield $2.1 trillion in global "green" investment opportunities for investors

In practice, institutional investors have limited exposure to green investments. Less than one percent of global institutional investors' holdings are in low-carbon assets, and they accounted for just 0.2 percent of total climate finance flows in 2016.[6] Approximately seven percent of their equity portfolio remains exposed to the fossil fuel industry, and broader exposure to climate-policy-relevant sectors reaches roughly 45 percent.[7] As such, the academic and institutional literature often calls the investor community to action.

Among institutional investors, none are better positioned than the pension fund industry to lead the transition to green finance. Global pension assets amounted to an estimated $44.1 trillion in 2018 – representing the second-largest source of institutional capital globally after mutual funds. Over the last decade, they have seen significant growth with almost all reporting countries reporting positive nominal growth in assets and absolute enrolment numbers. The average ratio of pension assets to GDP in OECD countries has steadily increased from 49.7 percent in 2008 to 126 percent in 2018. Pension assets even exceeded GDP in 8 out 36 OECD countries in 2018.[8] Given their long-term perspective and their unique positioning of "universal investors', they are well suited to invest in illiquid assets and foster the green transition.

3. World Economic Forum (2019)
4. Buchner et al. (2019)
5. Röttgers et al. (2018)
6. Buchner et al. (2017)
7. Battiston et al. (2017)
8. OECD Pension Markets in Focus 2019

Though pension assets globally are fairly concentrated in absolute terms, they can also represent a significant portion of developing economies' GDP. 22 countries hold $40 trillion of the total pension assets and seven of those hold $36 trillion. They are Australia, Canada, Japan, the Netherlands, Switzerland, the United Kingdom and the United States.[9] Many of them are facing their own climate challenges: Australia's wildfires, Canada's melting Arctic, the Netherlands' sea-level rise. While the pension systems in middle income countries are smaller in absolute size, their relative size is comparable to that of high-income countries. For example, the ratio of pension assets to GDP is 95.1 percent in South Africa, 91.3 percent in Namibia, and 40.9 percent in El Salvador, and similar in many other countries.[10] In fact, it is doubly important for low and middle income countries to safeguard their pension system as it serves as an important source of domestic investment and shock-absorption.[11]

The debate on responsible investment by pension funds has focused around four main themes: risk; reporting; fiduciary duty; and engagement. This report adopts the United Nations Principles for Responsible Investment (UN PRI) definition of responsible investment as "a strategy and practice to incorporate environmental, social, and governance (ESG) factors in investment decision and active ownership".[12] Academic literature focuses on four main themes:

- **RISK:** recent work on climate risk suggest that it is a long-run source of financial risk. This body of literature highlights institutional investors' current perceptions of climate risks and identifies several types of risk: physical risk, transition risk, and liability risk.[13]
- **DISCLOSURE:** the debate on climate-related disclosure centers on the effectiveness of mandatory versus voluntary disclosures, the content of the disclosures, and their ultimate effect on the climate crisis.[14] Specifically, some scholars question whether disclosure is bound to remove a variety of barriers, notably agency issues and short-termism, currently impeding the spread of green finance.[15]
- **FIDUCIARY DUTY:** in 2005, the United Nations Environment Programme Finance Initiative (UNEP FI) commissioned Freshfields Bruckhaus Deringer to publish a report on the legal framework needed to integrate ESG issues into the practices of institutional investors. The report argued that "integrating ESG considerations into an investment analysis so as to more reliably predict financial performance is clearly permissible and is arguably required in all jurisdictions". 'Fiduciary Duty in the 21st Century', a joint initiative of the PRI, Generation Foundation, and the UN Environment Program, published in 2015, is the follow-on report, which aims to outline how traditional concepts of loyalty and prudence translate into modern fiduciary duty.[16]

  Their seminal publication argues that modern fiduciary duties of investors include:
  - » accounting for financially material ESG factors;
  - » incorporating stakeholder preferences into decisions;
  - » supporting the stability and resilience of the financial system;
  - » disclosing investment practices; and,
  - » practicing active ownership.[17]

- **ENGAGEMENT:** shareholder engagement in particular is seen as the cornerstone of sustainable investing. Where literature previously focused on the more traditional hedge fund activism which sought to advance shareholder interests, scholars are now focusing on ESG activism. Researchers are discussing whether shareholder activism is effective, and if so, how it impacts shareholder and stakeholder values. There is significant evidence that successful engagements are followed by positive financial returns.[18]

In recognition of the debate along these themes, the regulatory environment for pension funds has started to incentivize ESG considerations, and pension funds have been increasingly focusing on sustainable investments. Among high income countries, the EU is leading regulatory action requiring institutional investors to disclose and consider climate risk.[19]

9. Willis Tower Watson Global Pension Assets Study 2019
10. OECD Funded Pensions Indicators 2019
11. Amaglobeli et al. (2019)
12. "What Is Responsible Investment?," PRI, 2019
13. Krueger et al (2019)
14. Hahn et al (2015)
15. Ameli et al. (2019)
16. To date, the two most comprehensive reports on pension system greening are: Kirjanas et al. (2018), and Della Croce, Kaminker and Stewart (2011)
17. Rory Sullivan et al., "Fiduciary Duty in the 21st Century" (PRI, October 2019)
18. Kim et al. (2011), Dimson, Karakaş, and Li (2015)
19. Guarascio (2019)

Climate change and the role of private finance has long been a focus on the international stage. The United Nations Framework Convention on Climate Change (UNFCCC) was ratified in 1994. Since then, there have been numerous commitments to increase climate finance including the Cancun Agreement and most recently the Paris Agreement in 2015.[20] Initiatives to incorporate climate risks into financial sector analysis, and to raise private sector financing to meet climate goals have also been building. Some of the major milestones include:

- **GFSG:** the G20 under the presidency of Mexico established the Climate Finance Study Group with the aim of mobilizing resources taking into account the objectives of the UNFCCC.[21] Subsequently, the G20 Green Finance Study Group (GFSG) was established under the leadership of China in 2015. The GFSG has the mandate to "identify institutional and market barriers to green finance, and based on country experiences, develop options on how to enhance the ability of the financial system to mobilize private capital for green investment."[22] Under Argentina's presidency the scope of the group has expanded.
- **TCFD:** the Financial Stability Board created the Task-force on Climate-related Financial Disclosure (TCFD) in 2015. The remit of the TCFD was to develop voluntary and consistent climate-related financial risk disclosures that would aid institutional investors in improving understanding of material risks. Members of the Task Force include banks, insurance companies, credit rating agencies and pension funds. The TCFD published its final report and recommendations based on four areas in 2017 and the report made the following recommendations:
  - » **Governance:** Disclose the organization's governance around climate related risks and opportunities.
  - » **Strategy:** Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.
  - » **Risk Management:** Disclose how the organization identifies, assesses, and manages climate-related risks.
  - » **Metrics and Target:** Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material."

  Currently, the TCFD represents 930 organizations, 87 of which are pension funds. Despite an increase in the disclosure of climate related financial information, the 2019 TCFD progress report found that progress was not sufficient and greater clarity is needed on the potential financial impact of climate related risks or issues.[23]
- **IIGC:** on the industry side, the Institutional Investors Group on Climate Change (IIGC) was established in 2001 as a forum between European pension funds and asset managers. Currently, the organization has 200 members and works towards mobilizing capital for low carbon investments and increasing resilience to the impacts of climate change. In 2019, the IIGC launched the Paris Aligned Investment Initiative which aims to provide guidance and methodologies for investors to align portfolios with the Paris Agreement. The group is co-chaired by representatives from APB and the Church of England Pensions Board.[24]
- **NGFS:** the Network for Greening the Financial System (NGFS) was created in 2017. The group shares best practices and works to contribute amongst policymakers, with the aim of promoting climate risk management in the financial sector.[25] NGFS members acknowledged that "climate-related risks are a source of financial risk. It is therefore within the mandates of central banks and supervisors to ensure the financial system is resilient to these risks."

In summary, pension funds have been recognized as a potentially significant sources of financing to meet climate goals, with numerous initiatives launched to help them fulfil this role – but more needs to be done. There is a significant financial gap to address climate change, while less than one percent of global institutional investors invest in the low-carbon climate resilient pathway. So far, the global institutional investment community has supported regulatory efforts led by the PRI and the TCFD on identifying and disclosing climate-related financial risks. European pension funds lead regulatory action on ESG disclosure and climate risk consideration. In low-and middle-income countries, where pension funds have a critical weight in the economy, several regulators and pension managers have started acting proactively in favor of the green transition. Several international platforms since 1994 have raised awareness on the role of the investment community to address climate change and the need to align investment practices with ESG considerations. In order to meet ambitious and urgent climate goals, these initiatives need to be built on to move from awareness and commitment to capital commitments and changes in investment behaviour.

20. Lattanzio (2019)
21. Climate Finance Study Group, "Promoting Efficient and Transparent Provision and Mobilization of Climate Finance to Enhance Ambition of Mitigation and Adaptation Actions," June 2016
22. G20 Green Finance Synthesis Report" (2016)
23. TCFD, "Task Force on Climate-Related Financial Disclosures: 2019 Status Report"
25. IIGCC, "2019 Year in Review"
26. NGFS Secretariat, "A Call for Action: Climate Change as a Source of Financial Risk" (Network for Greening the Financial System, April 2019), https://www.banque-france.fr/sites/default/files/media/2019/04/17/ngfs_first_comprehensive_report_-_17042019_0.pdf.

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Climate Risk Exposure Landscape

INTRODUCTION

Climate risk has increasingly emerged as one of the main risks to the current financial system. Financial institutions are, and will increasingly be, exposed to climate risks, which covers physical, transition and liability risks. An allocation of capital consistent with the transition is based on and is reinforced by adequate management of the risks and opportunities posed by climate change to the financial sector. These risks are multifaceted and can affect the financial sector through three channels (See Table 1):

- "physical risks" that can arise from weather and climate events
- "transition risks" that result from the adjustment process towards a low-carbon economy
- "liability risks", which is a particular form of the two categories above.[27]

For the purpose of this report, to identify the risks and challenges of climate change that pension funds across the world face, an in-depth data review and quantitative analysis was conducted to create a heatmap of pension fund climate risk for 71 countries.[28] In order to derive a measure for pension fund climate risk, three key variables were used: **i. country climate change risk; ii. pension assets-to-GDP ratio; percentage of pension assets held domestically.** This approach allows us to estimate pension fund exposure to climate change risk, account for relative pension fund size and the level of pension asset diversification. While all countries will face the material effects of climate change, some pension systems will be more vulnerable than others. The purpose of this analysis is to map pension risk and identify pension funds most at risk from the negative effects of climate change both in low, middle, and high-income countries. This will allow key trends and policy recommendations to be identified in order to help countries mitigate climate exposure and pension asset risk. The following sections outline the data sources, methodology, and findings.

Throughout the comprehensive research and data analysis process, many data sources and indexes were considered. While there is no one comprehensive source of climate risk data, the final output used datasets that were available for the largest group of countries and had the most comprehensive country climate data. Where possible, three-year averages of data from 2015-2017 were used due to data limitations and to ensure coverage for the largest number of countries. For 19 observations three-year averages were not available using pension data—latest available data was used instead.

Climate risk data: Notre Dame Global Adaptation Index

27. NGFS Secretariat, "A Call for Action: Climate Change as a Source of Financial Risk."
28. This report defines a pension system as any plan, fund, or scheme which provides retirement income. Pension funds are pooled monetary contributions from pension plans set up by employers, unions, or other organizations to provide for their employees' or members' retirement benefits.

The base country climate change score used Notre Dame Global Adaptation Initiative Index (ND-GAIN), which scores 181 countries across 45 indicators on their vulnerability to climate change and ability or readiness to adapt.[29] Vulnerability is defined as *"the propensity or predisposition of human societies to be negatively impacted by climate hazards"* and is measured across six key areas: food, water, health, ecosystem services, human habitat, and infrastructure. The six sectors in turn are given a composite measure based on six indicators which measure exposure to climate change hazards, *sensitivity* within the sector to impacts of climate change and the *adaptive capacity* of sectors to cope with the impact of climate change. Readiness is defined as the ability of a country to use effective investments to undertake adaptation actions. Readiness is measured on three areas by the index: a) economic - measured as the ease of doing business, b) governance - a composite measure taking into account rule of law, regulatory quality, corruption and political stability, and c) social readiness a composite measure taking into account inequality, ICT infrastructure, education, and innovation.[30] This data set is comprehensive in that it accounts for water scarcity, sea level rise, risk of climate change-induced diseases, and more. However, it is limited in that it does not account for extreme weather events or natural disasters, e.g. hurricanes. A potential extension of this mapping would be to incorporate data from indexes such as Germanwatch, which explicitly map the risks of extreme weather events.[31] Climate change can have compounding effects and increase the likelihood of extreme weather events, which will increase in frequency if we reach tipping points. Figure 3 gives an overview of how the ND-GAIN score is derived. A comprehensive technical note with detail on each indicator is publicly available.[32]

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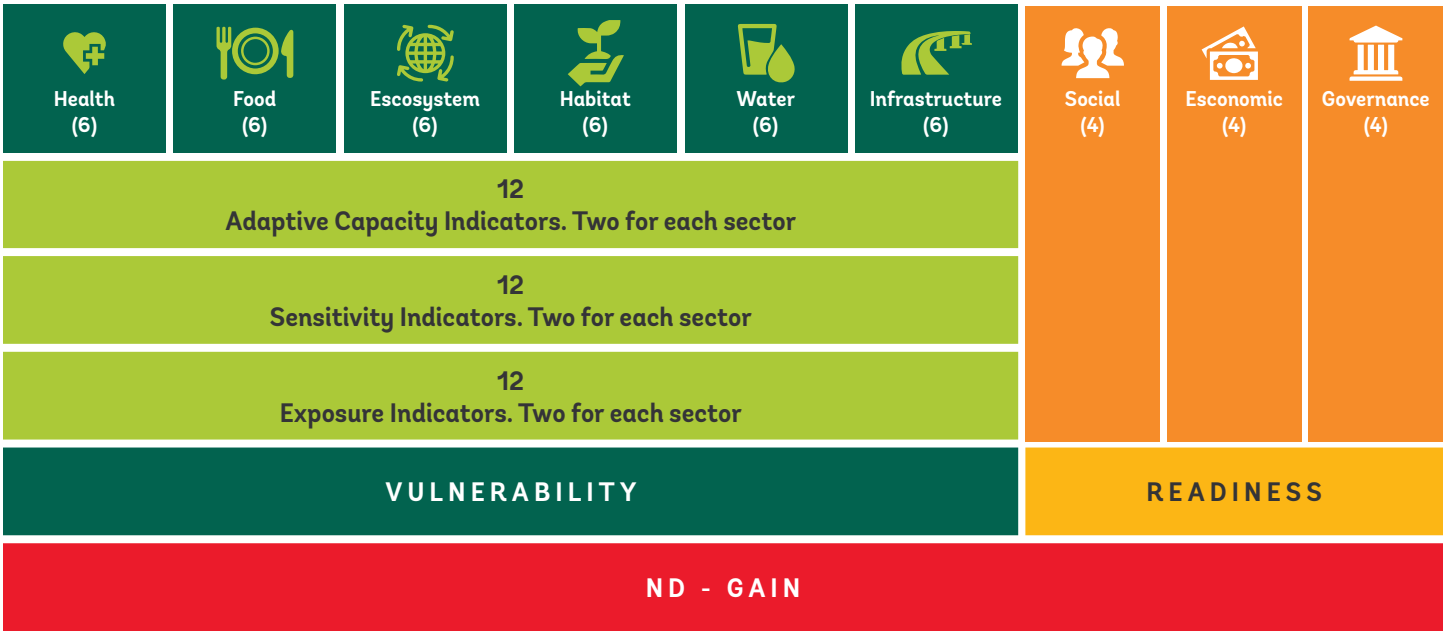
FIGURE 3 - ND-GAIN measure summary [33]



Pension asset data

The country data on pension assets-to-GDP ratio and the percentage of pension fund assets invested domestically came from several sources. The primary source of pension data was the OECD *Global Pension Statistics*, which offers the most comprehensive global coverage.[34] This data details the size of countries' pension assets as a percentage of GDP and the percentage of assets held domestically for 49 countries. Further data on pension fund domestic assets was derived from the OECD *Annual Survey of Investment Regulation of Pension Funds 2019*.[35] Countries that have legislation or laws banning foreign investment by pension funds were assumed to have 100 percent of pension fund assets held domestically. In addition, countries that had pension fund foreign investment limits, and where other data was unavailable, were assumed to invest up to that limit i.e. if a country had a 15 percent limit on foreign investments pension funds were assumed to diversify their assets and invest 15 percent in foreign assets with the other 85 percent held domestically.

29. In this analysis we use the ND-GAIN score unadjusted by GDP.
30. Chen et al (2015)
31. "Germanwatch," 2020, https://germanwatch.org/en.
32. Chen et al. (2015)
33. Chen et al. (2015)
34. "Global Pension Statistics," OECD, 2019
35. "Annual Survey of Investment Regulation of Pension Funds" (OECD, 2019)

Other supplementary sources of data were used to fill data gaps on percentage of domestic assets. This was important in order for a more comprehensive understanding of climate risks faced by SIDS and high-income economies that had data missing. The team used the World Bank and Pacific Island Investment Forum pension funds data to provide a detailed breakdown of the size of and assets of pension funds across the Pacific Islands including Fiji, Papua New Guinea, and Vanuatu. Pension asset data for Germany, Canada, and Australia was used from the PwC *Beyond their Borders 2020* publication.[36] In order to include the US in our analysis, data from CEM Benchmarking on US pension funds was used as a proxy for the percentage of US pension funds held domestically and in foreign assets.[37]

METHODOLOGY

To derive the overall country pension score, countries were split into quintile groups based on their values across ND-GAIN score, pension assets-to-GDP ratio, and percentage of pension assets held domestically. Quintile thresholds were identified, and each country was assigned a corresponding quintile group based on their relative score. A quintile group of "1" indicates the best score and "5" indicates the worst score. For this purpose, the ND-GAIN index was inverted so that a higher score indicates higher vulnerability and lower readiness to implement climate change adaptation measures. Two other important assumptions were made in this process.

- First, countries which have a high exposure to climate change which also have larger pensions asset-to-GDP ratios potentially face greater negative shocks to their portfolios and investments from these risks. In the event of severe climate impacts, pension investment returns could be severely reduced with increased risk of stranded assets. While every pension fund is vulnerable from the material effects of climate change, larger pension funds that fail to adapt will have larger economic ramifications.
- Second, a country with pension fund assets held in several geographical areas in the event of a domestic climate shock will have more diversified exposure compared to a country whose assets are solely held domestically. Therefore, the percentage of domestic pension assets offers a useful proxy for the level of climate risk diversification.

Table 1 details the cut-off score for each quintile group. A country's raw scores on each variable determine the quintile group allocation. Any country with pension asset-to-GDP ratios above 50.8 percent, with 95 percent of those assets held domestically would be assigned the worst quintile score of 5 for both variables. Thus, if a country has 100 percent of pension assets held domestically, they will be assigned to quintile group 5 for this measure, and if these assets represent under 1 percent of GDP, the country will be assigned a quintile score of 1 for this measure. An ND-GAIN score of 5 would be assigned to quintile group 1, a score of 9 to quintile group 2 and so on.

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TABLE 1 - Quintile groupings

	Inverted ND-GAIN score	Pension assets as a percent of GDP	Percent of pensions assets held domestically
	33.51492188	5.663666667	59.86666667
Q2: 20-40%	41.32910328	8.990666667	75.64
Q3: 40-60%	48.60772015	16.3	86.43333333
Q4: 60-80%	54.98604968	50.84966667	95
Q5: 80-100%	<54.9860496799179	<50.8496666666667	<95

36. "Beyond Their Borders: Evolution of Foreign Investments by Pension Funds" (PwC, 2020), https://www.alfi.lu/getattachment/bbd902ee-feb9-4534-b68c-aee8c6706f4e/alfi-evolution-of-foreign-investments-by-pension-funds.pdf.
37. "CEM Benchmarking," 2020, https://www.cembenchmarking.com/.

The final step to derive the overall pension climate risk score involved weighting the quintile groups across the three variables. Pension asset-to-GDP ratio was double-weighted to reflect the higher economic exposure countries with much larger pension assets face from climate risks. Moreover, the double-weighting also accounts for the fact that many countries pension systems are non-existent or represent a small percentage of GDP. The ND-GAIN index and percentage of assets held domestically were weighted equally. Therefore, the pension risk score for each country is:

*(0.25*ND-GAIN quintile) + (0.5*percent GDP pension assets quintile) + (0.25* percent domestic assets quintile)*

For example, if a country was in quintile group 5 for ND-GAIN, 4 for percentage of pension assets of GDP and 2 for domestic pension assets the overall pension fund climate risk would be:

*(0.25*5) + (0.5*3) + (0.25*4) = 3.75*

FINDINGS

Figure 5 is a heatmap of the pension fund climate risk scores as described above. On this heatmap, yellow indicates a country with a lower pension fund climate risk; orange, medium; and red, high pension fund climate risk. The mapping indicates countries' risk relative to each other and a low pension risk score does not preclude mitigative action. Indeed, no country scored in the top quintile for each variable and climate risks of country pension funds are often different in nature.

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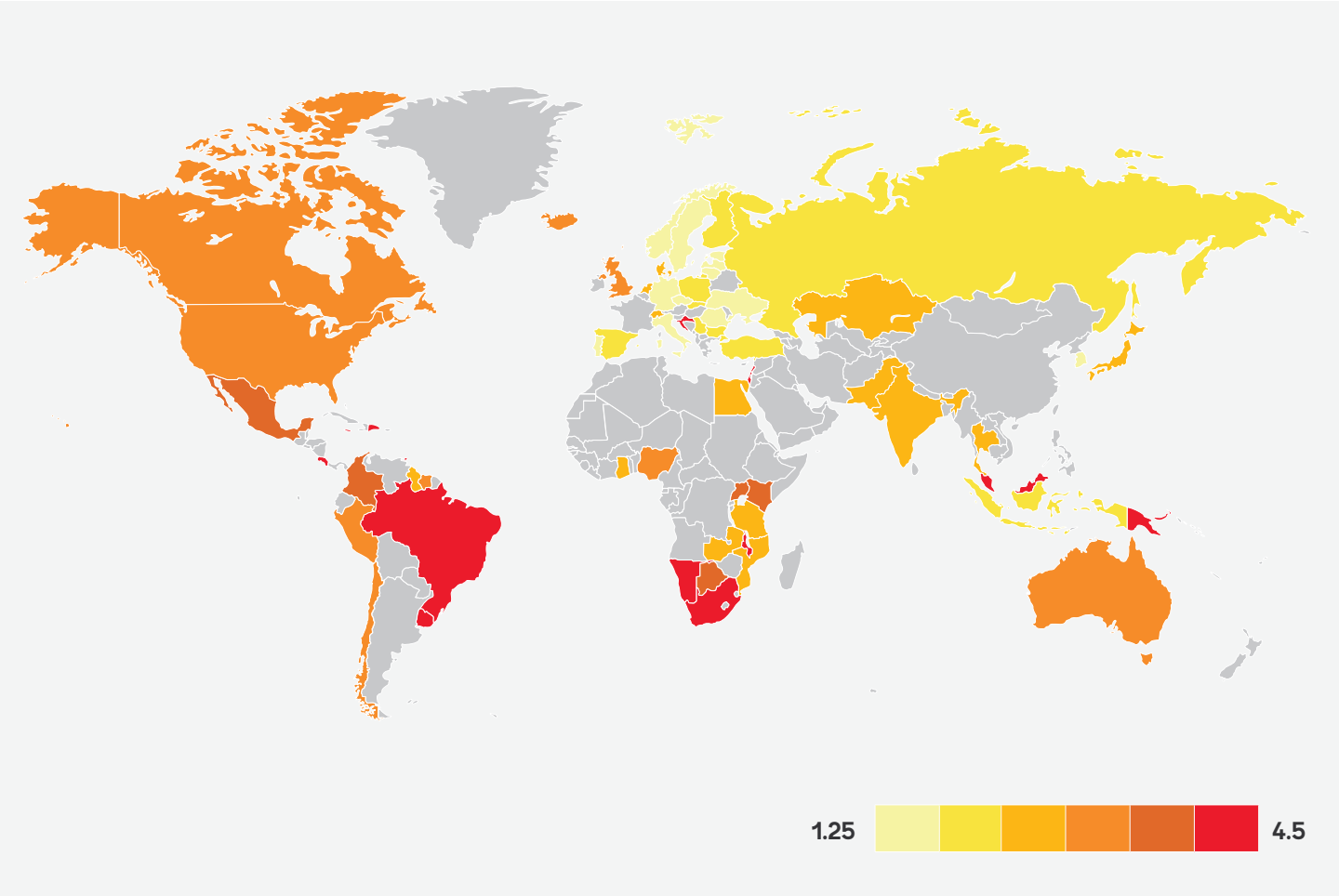
FIGURE 5 - Country Pension Climate Risk Heatmap



European countries such as Italy, Latvia, Lithuania, Sweden and Slovenia have the lowest pension fund climate risk. This is in part because all have a much lower percentage pension assets relative to GDP compared to other high-income countries and, indeed, many low-income countries. The asset-to-GDP ratio for Latvia is only 1.5 percent and 5.6 percent in Sweden. Likewise, these countries have higher levels of diversification of assets (i.e. small percentages of assets held domestically) and score relatively well on the ND-GAIN index. Despite facing high climate risk, Armenia faces comparatively low pension risk due to small asset-to-GDP ratio and with pension funds holding approximately 30 percent of assets abroad.

Perhaps unsurprisingly, small island economies such as Papua New Guinea, Fiji, and Vanuatu have the highest levels of pension fund climate risk scoring relatively poorly on every measure. In addition to facing high country climate risk as small island developing states (SIDS), their pension funds hold most assets domestically - 100 percent in the case of Vanuatu, 93 percent in Fiji, and 87.2 percent in Papua New Guinea. Moreover, compared to other smaller economies, these countries have relatively high pension assets as a percentage of GDP. Small island countries in particular are vulnerable to effects of climate change such as sea level rise. In addition, their pension funds face substantial risk because of limited geographical portfolio diversification.

Similarly, South Africa has one of the highest levels of pension risk overall and compared to other African countries. While pension funds in South Africa invest 23 percent in foreign - a medium risk score - the country performs poorly on the ND-GAIN index and has a relatively large asset-to-GDP ratio. Many countries in the region face high levels of pension risk with high climate risk and the majority of assets invested domestically. That said, countries such as Egypt, Mozambique, and Zambia perform well compared to their peers. However, this is driven for the most part by their small pension fund size compared to GDP as these countries perform poorly otherwise.

While performing relatively well on country level climate measures, high income countries such as the United States, Canada, Australia and the United Kingdom are classified as medium to high level risk because of the large relative size of their pension fund assets. All of these countries have average pension assets-to-GDP ratios over 80 percent for the 2015-2017, with Australia's ratio above 120 percent. These economies are better equipped to adapt to climate challenges, but the potential material risk on pension fund assets is large. Many of these countries should take advantage of the opportunities that greening the pension system can bring, with green finance markets increasing in prominence and offering long-term returns.

The majority of South American countries score medium to high risk. Brazil, Costa Rica, and Uruguay score high to medium on pension climate risk indicators. For the most part, the pension assets of these countries are held domestically (above 90 percent for all three) and the countries score relatively poorly on the ND-GAIN index. Mexico and Colombia, while facing higher country climate risk than Uruguay and Costa Rica, have a lower level of pension climate risk. Mexican pension fund foreign assets are slightly higher and the asset-to-GDP ratio is lower than both Uruguay and Costa Rica. Conversely, Colombian pension funds invest approximately 32 percent in foreign assets, which is comparatively high for the region. The majority of the countries in this region perform poorly on all measures with the exception of Chile and Peru. Chile scores well on the ND-GAIN index and has comparatively higher diversification of pension fund portfolios with slightly over 59 percent of its assets held domestically. Peru, while facing high domestic climate risk, similarly has geographically diversified pension assets.

Asian countries, broadly defined, fare relatively better compared to other regions, with the exception of Singapore. Singapore has one of the highest pension climate risks due to a high asset-to-GDP ratio and the fact that the entirety of its pension assets are held domestically. In contrast, South Korea has the lowest pension climate risk of the region, scoring well on the ND-GAIN index and with an asset-to-GDP ratio of 8.9 percent. However, the South Korean pension assets are 90 percent domestic scoring it in the second lowest quantile grouping. India and Pakistan face higher levels of pension risk, in particular because they either have bans on pension funds investing in foreign assets or no effective rules to do so. As a result, all pension assets are held domestically in these two countries. Indonesia's pension risk is comparatively low overall and for the region, however, this is driven by a very low asset-to-GDP ratio of 1.8 percent, with high country climate risk and low pension asset diversification otherwise. Table 2 further details the top and bottom scoring countries on the pension fund climate index.

> > >

TABLE 2 - Highest and lowest pension risk scores by country

TOP 3 LOWEST PENSION Climate Risk Score and Countries		TOP 3 HIGHEST PENSION Climate Risk Scores and Countries	
1.25	Latvia	4.5	Fiji, Vanuatu
1.5	Sweden	4.25	Papua New Guinea, South Africa
1.75	Armenia, Italy, Lithuania, Slovenia	4	Malawi, Singapore, Trinidad and Tobago

CONCLUSION

Overall the analysis indicates that pension funds face climate risk and different countries are vulnerable in different ways. While many high-income countries may have the capacity to adapt to the challenges of climate change, large asset-to-GDP ratios mean the material effects of climate change could be large. In addition, the limited capital invested in green assets even by pension funds leading in the green finance space should be a cause for concern. Nine low income countries in our analysis have 100 percent of pension assets invested domestically. Indeed, the general trend is that low income countries have much lower geographical diversification of assets despite facing high levels of pension risk in most cases. These risks are particularly prominent for SIDS. Greater geographical diversification of assets, and in some cases changes of regulation to allow this, are recommendations that follow from this analysis.

While every effort was made to use the most comprehensive data and coverage, there are some limitations that future research should seek to address. First, missing data on several pension funds means that the analysis is restricted to 71 countries. Following works could seek to analyze the pension fund risk of a wider number of countries. Second, this analysis assumes the same level of pension fund climate risk and allocation of pension fund assets across entire countries. For large countries such as the US and Australia, where regional pension funds are more or less active in the green finance space, this might not necessarily be true. A more granular regional analysis could provide further interesting insights. Third, the analysis could benefit from incorporating other important measures of climate risk such as the impact of extreme weather events and measures indirectly related to climate change - e.g. air pollution, waste management - should be considered. Factoring in risks from extreme weather events would highlight an increased vulnerability and risk for small island nations, which already face the highest pension risk according to our measure, but are likely underweighted in terms of e.g. hurricane risk. In addition, the robustness of these findings may be checked against other climate risk indexes.

An important assumption made in this analysis is that geographical diversification of assets reduces climate risk unanimously. While this is often plausible in many scenarios, future research could account for foreign asset risk by deriving a measure of average world climate risk. This, however, would have to take into account feasible assumptions about world pension asset allocations by geography. A potential proxy for the risk of pension foreign asset allocations could be world equity indices such as the MSCI All Country World Index (MSCI AWCI), which could be weighted by the ND country climate risk methodology. These could be used to derive a weighted value for the climate risk of foreign assets based on the percentage of assets invested in each country. In addition, a more 'bottom up approach' could be taken, analyzing the sectoral exposure of different countries stock market indices to see which are particularly exposure to high emission sectors such as energy.[38] This information could further refine the analysis of how much climate risk pension funds' domestic investments represent.

In summary, this climate risk map should serve as a starting point to identify country level pension fund risk and for pension systems and pension funds to begin addressing them. The methodology uses three variables and a system of quintiles to assess the exposure to climate-change of pension funds in 71 countries, and the findings emphasize that pension systems are vulnerable in different ways. Many European countries have the lowest pension climate risk, notably because of a much lower pension asset to GDP ratio compared to other countries. Small island economies have the highest levels of pension climate risk and their pension systems face substantial risk because of limited geographical portfolio diversification. Most African countries, with some notable exceptions, face high levels of pension risk with high climate risk and the majority of assets invested domestically. Some high-income countries are classified as medium to high level risk because of the large relative size of their pension fund assets. The majority of South American countries perform poorly on all measures, except Chile and Peru. Asian countries fare relatively better compared to other regions.

38. For example, some domestic stock indexes (such as in Colombia or Latvia) are particularly heavily weighted towards the energy sector.

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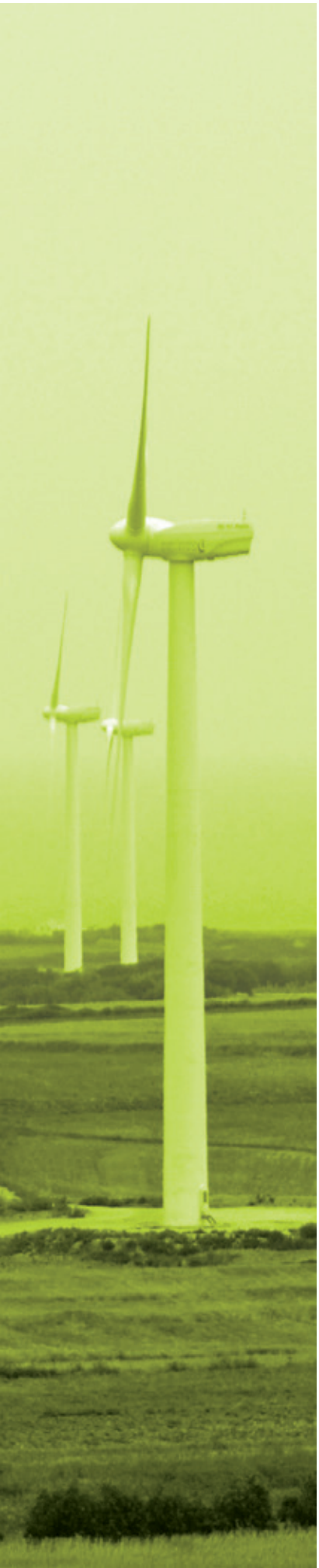

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Regulatory Landscape

INTRODUCTION

An important counterpart to mapping country pension climate risk is the regulatory environment that pension funds operate in which can act as an important mitigant. Since 2008, there has been a strong momentum towards stricter regulatory measures across the world's 50 largest economies in the area of sustainable investments applicable to asset owners with a 250 percent growth in the number of regulatory measures in this field, reaching 350 measures in 2016. By 2019, across some 500 policy instruments, more than 730 hard and soft law policy revisions existed to encourage or require investors to consider long-term value factors.[39]

Most of the regulations focus on long-term value drivers, including ESG factors. Regulatory initiatives that reinforce responsible investment practice for pension funds can catalyze ESG incorporation into investment decision making and help reduce the material risks climate change poses to pension funds. Regulatory norms, in particular in relation to fiduciary duty, put further impetus behind the agenda of responsible investment. Some national supervisory authorities have already made ESG integration and disclosures mandatory. For example, in November 2018, Sweden introduced new investment guidelines for AP funds 1-4. These include flexibility to invest more in illiquid asset classes and more in-house oversight. Most importantly, AP 1-4 must invest in a way that contributes to sustainable development.[40] In March 2020, Mexico's National Commission for the Retirement Savings Systems (CONSAR) published mandatory provisions for pension funds relating to ESG integration in debt and equity, ESG risk and investment policies, and ESG disclosure that will go into effect in 2022.[41]

For this paper, an extensive review of regulations on sustainable investment for pension funds was undertaken. This aimed at: providing an overall picture of the level of advancement on socially responsible investment (SRI) and responsible investment (RI) legal frameworks; identifying best practices and laggards; comparing this legal backdrop with the exposure of national pension funds to climate-related financial risks; and measuring the extent to which international regulatory standards and recommendations around ESG have been implemented. The goal is to outline potential regulatory enablers of sustainable investment that mitigate climate exposure and vulnerability and foster positive social and environmental impacts. This relationship was explored with two methodologies: a regulatory map and a survey.

39. "Taking Stock: Sustainable Finance Policy Engagement and Policy Influence" (Principles for Responsible Investment, 2019),
40. Rachel Fixen, "Swedish Parliament Approves Buffer Fund Investment Freedoms Bill," IPE, November 2018, https://www.ipe.com/swedish-parliament-approves-buffer-fund-investment-freedoms-bill/10028423.article.
41. "DISPOSICIONES de carácter general en materia financiera de los Sistemas de Ahorro para el Retiro" (2020), https://www.gob.mx/cms/uploads/attachment/file/542142/CUF_compilada_20200303.pdf.

3.1 Regulatory mapping

DATA

The main database is the United Nations Principles for Responsible Investment's regulation map. This map covers 500 responsible investment-related legislation and soft law initiatives across the 50 largest economies in the world.[42] Per the PRI's methodology, the regulation map indicates the year of implementation, the responsible authority, whether the measure is voluntary or mandatory, the integration of environmental, social and/or governance issues, and whether it addresses these issues in isolation or in combination. Data pertaining to ESG regulation targeting pension funds was selected, which included requirements to incorporate ESG or disclose how ESG is considered, stewardship codes, and best principles for engagement and voting. Almost half—23 of the 50 countries analyzed in the PRI database—possess or are working on rules regarding pension funds and ESG criteria. Most regulatory frameworks do not refer to ESG issues with explicit directives on how to integrate them. However, there is an upside to such flexibility; these frameworks do not prevent pension funds from making further effort on ESG integration.[43]

Additionally, the research was supplemented with the following reports and databases:

- OECD 2019, *"Annual Survey of Investment Regulation of Pension Funds"* [44]
- EUROSIF 2011, *"Corporate Pension Funds and Sustainable Investment Study"*[45]
- PRI 2016, Global Guide to Responsible Investment Regulation[46]
- World Bank 2018, Incorporating Environmental, Social and Governance (ESG) Factors into Fixed Income Investment.[47]

METHODOLOGY

The regulatory map combined quantitative and qualitative approaches. The qualitative approach, based on a granular review of the existing regulatory frameworks and norms of 23 countries aimed at identifying the requirements, binding or non-binding, related to:

- The definition of asset owners' fiduciary duties as regards ESG issues in their investment processes and capital allocations;
- The nature and scope of the requirements to disclose ESG issues;
- The nature and scope of the requirements to engage with companies and issuers on ESG issues;
- The nature and scope of the requirements to report on ESG issues, and the mention of specific reporting guidelines;
- The differentiated weight given to each pillar of ESG issues;
- The attention given in legal frameworks to the long-term impact of climate change and the recognition of its materiality to investment outcomes;
- The mention of exclusion requirements by negative screening (e.g. exclusion of investments in the tobacco industry);
- The presence of control mechanisms or sanctions attached to SRI regulation.

This data was compared across regions to identify similarities based on geography, type of pension funds (i.e. defined benefit or defined contribution), size in terms of assets under management, and type of law (e.g. Common Law or French law).

The quantitative analysis built on the findings of our qualitative research. First, pension funds for 50 countries were mapped into the database by identifying the legal specificities applicable to pension funds pertaining to sustainable investment. Specifically, whether ESG regulation pertained to pension funds was examined, whether it was mandatory, voluntary, or comply-or-explain, whether it requires ESG integration and how each pillar is considered, whether there is an exclusion policy, and whether there is a requirement to report or disclose ESG issues. The mandatory regulation designation indicates that some type of stewardship law exists that does not directly address ESG, whereas the mandatory ESG regulation designation is given to countries where clear ESG guidance exists.

42. "Responsible Investment Regulation Map," Principles for Responsible investment, September 9, 2019,
43. "Responsible Investment: 2017 Annual Study"
44. OECD "Annual Survey of Investment Regulation of Pension Funds"
45. "Corporate Pension Funds & Sustainable Investment Study" (Eurosif, 2011)
46. "Global Guide to Responsible Investment Regulation" (Principles for Responsible Investment, 2016),
47. Inderst and Stewart (2018)

For each above-mentioned criterion, a numerical score between one and ten was allocated. Lower scores indicate higher regulatory risk. The score came from both ESG regulations and national stewardship codes. Stewardship code guidelines were discounted by one-third, to reflect the focus on regulation. The below grid indicates our scoring matrix (See Table 3).

> > >

TABLE 3 - Scoring Matrix for Regulatory Risk

Mandatory ESG	M*ESG	10
Mandatory Environmental	M*E	9
Mandatory Social	M*S	8
Mandatory Governance	M*G	8
Comply-or-Explain ESG	C*E*ESG	7
Mandatory	M	7
Voluntary ESG	V*ESG	5
No ESG	N	1

FINDINGS

The methodology yielded the below comparison of climate risk to regulation risk data (See Figures 6 and 7). Overall, the majority of countries have several regulatory frameworks that pertain to sustainable investing for pension funds, weaving mandatory and voluntary elements together. The interpretation and nature of sustainable investment regulation tend to vary across geographical regions. In Europe, regulations tend to be relatively prescriptive, whereas in Asia and North America they are almost exclusively voluntary. The following definition was adopted for "hard" or mandatory regulations: sustainable investment norms applicable to pension funds set out legally binding and specific duties and obligations. For soft" or voluntary guidelines: *sustainable investment guidelines applicable to pension funds refer to a large spectrum of quasi-legal instruments that are not clearly defined, leaving the level of application to the pension funds.*[48]

48. Neher (2017)

> > >

FIGURE 6 - Comparing pension climate risk and regulatory risk

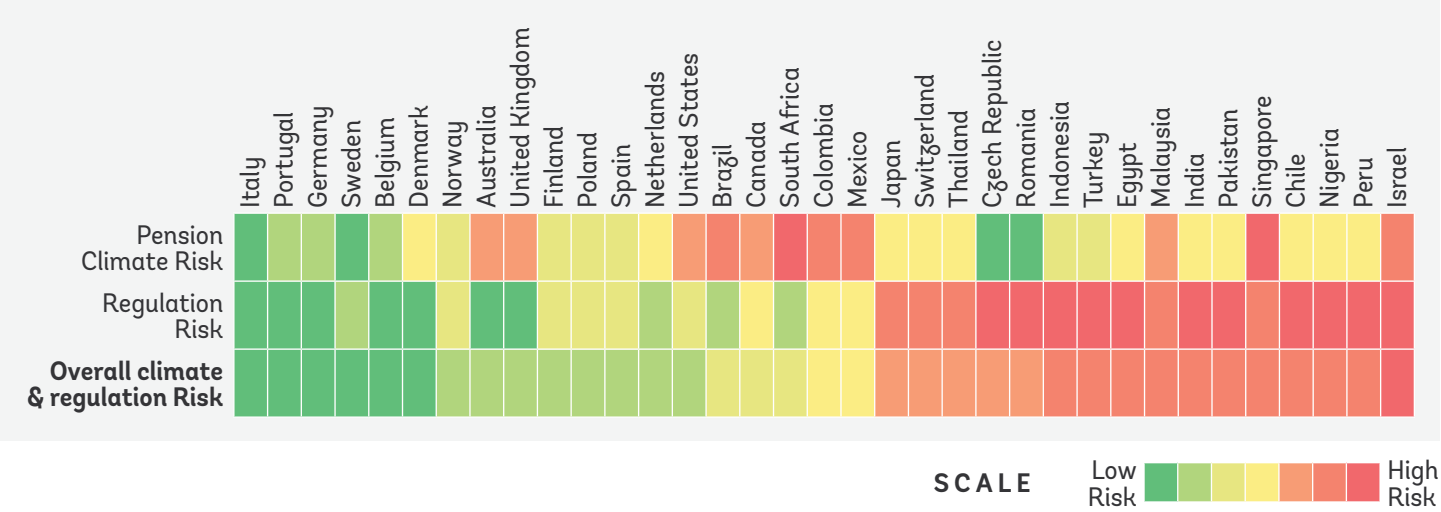

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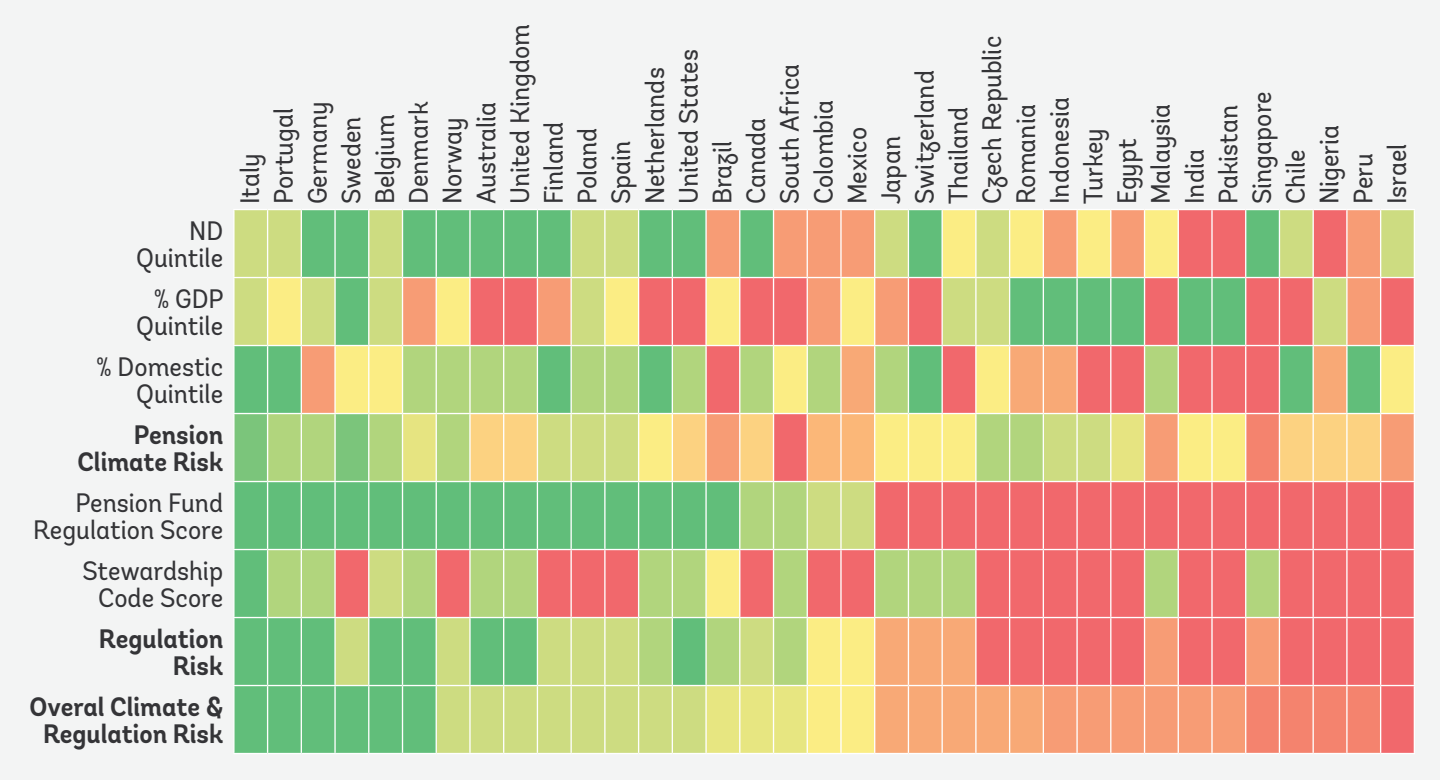
TABLE 7 - Disaggregated scores for pension climate risk and regulatory risk



Additionally, 21 out of 50 national jurisdictions have implemented regulations regarding ESG reporting and disclosure requirements. Some jurisdictions implemented "comply-or-explain" policies in their disclosure process, e.g. South African, Norway. Most others require disclosure without issuing specific guidelines on how such disclosure should occur. Self-regulation plays an important role in many countries, with many pension funds recognizing the materiality of ESG factors and adjusting investment strategies accordingly.

Examining each jurisdictions climate risk score against its regulatory risk score, as indicated in the tables below for select jurisdictions. This allowed four important categories of combined risk to be identified (See Figures 8): highly regulated low climate risk countries, highly regulated high climate risk countries, lightly regulated low risk countries, and countries with high climate risk and improving regulation.

> > >

FIGURE 8 - Four-quadrant matrix of combined climate and regulatory risk in 35 jurisdictions

1. COUNTRIES WITH LOW PENSION VULNERABILITY TO CLIMATE CHANGE AND *LOW* REGULATORY RISK:

This category consists of exclusively European countries, all of which displayed a high level of ESG-related regulatory measures and frameworks (See Focus Box 2). France is particularly ahead with far-reaching requirements in terms of ESG reporting by pension funds. The French Article 173-VI of the Energy Transition Act requires pension funds to provide information on how they integrate ESG factors in their investment, voting decisions, exposure to climate risks, and contribution to the transition to a low carbon economy in their portfolio construction. Amongst European countries, Scandinavian countries have pioneered the introduction of standards and frameworks promoting ESG activities in financial management. For example, the Norwegian Government Pension Act of 2005 led the government to introduce a set of ethical guidelines. Given the influence and size of the Norwegian pension fund, these guidelines have become a benchmark for responsible investment across Europe and beyond.

> > >

BOX 1 - European Sustainable Finance Regulatory Framework

At the EU level, the Institutions for Occupational Retirement Provision (IORP) Directive provided a common set of basic requirements across member states until recently. Its second iteration, IORPII defined the importance attached to ESG factors both in terms of the potential impact of ESG factors on portfolio risks and returns, and pension funds' role as long-term investors. However, it allowed pension funds the discretion to integrate ESG factors in their investment policy on a voluntary basis, as follows: "Member States should require IORPs to explicitly disclose where these factors are considered in investment decisions and how they are part of their risk management system".

With the 2018 EU Action Plan on Sustainable Finance, the level of requirement regarding ESG integration will increase. A taxonomy has been published (March 2020), and disclosure requirements will apply to pension funds as they are financial market participants. For each relevant product, pension funds will be required to state:

- how and to what extent they have used the Taxonomy in determining the sustainability of the underlying investments;
- to what environmental objective(s) the investments contribute;
- the proportion of underlying investments that are Taxonomy-aligned, expressed as a percentage of the investment, fund or portfolio.

The revision of the EU Pension Fund Directive "Guideline on the activities and the supervision of occupational pension schemes" (2016) is another milestone for sustainable investments. Among other things, it compels pension funds to disclose the extent to which ESG factors are considered both in their investment decisions and in their risk management systems. This regulatory measure is likely to have a "multiplier effect" by influencing the reporting practices of multinational companies.

FRANCE

Since 2001, France has enacted a large number of laws governing sustainable investments targeted at pension funds, state pension schemes, and investment companies. The 2015 revision of the law on the energy transition for green growth signaled a very ambitious policy on ESG integration by asset owners and investors.

- **The Act of 19 February 2001** (Loi Fabius) introduced an incentive for pension funds to take environmental and social criteria into account in their asset management policy, and enabled the creation of solidarity-based employee savings funds.
- **The Act of 17 July 2001** stipulates that investors' management board, which implements the orientations of the institution's investment policy, reports to the supervisory board on "the manner in which the general orientations of the fund's investment policy have taken into account social, environmental or ethical considerations".
- **The law of 12 July 2010** on national commitment to the environment requires "société d'investissement à capital variable" (SICAVs) and management companies to disclose how they consider ESG issues in their investment policy and how they exercise the voting rights attached to the financial instruments resulting from these choices.
- **The law of 17 August 2015** on the energy transition for green growth extends these obligations to institutional investors and requires them to fully disclose their investment guidelines, the carbon footprint of their portfolios and their orientation to climate targets, as well as reporting their climate risks. This is the first law of its type worldwide.

UNITED KINGDOM

Similarly to France, the UK is particularly ahead on sustainable investment guidelines for investors and asset owners. Notably, several laws promote transparency of pension funds and investment strategies in charities, and include tax breaks for investments for solidarity purposes.

- **The Occupational Pension Schemes (Investment) Regulation** (1995-2001) compels local government pension funds' Statement of Investment Principles to report (in their Statement of investment principles or Declaration of Investment Principles) the extent to which social, environmental and social criteria are taken into account; and when they select, retain or carry out their investments.
- **The "Code of practice for defined-contribution schemes"** (2016) requires pension funds to take into consideration all financially relevant factors, including ESG criteria, in their investments.

49. "European SRI Study" (Eurosif, 2018), http://www.eurosif.org/wp-content/uploads/2018/11/European-SRI-2018-Study.pdf; "L'investissement socialement responsable," Ministère de la Transition écologique et solidaire, February 7, 2019, https://www.ecologique-solidaire.gouv.fr/linvestissement-socialement-responsable.

2. COUNTRIES WITH *LOW* PENSION VULNERABILITY TO CLIMATE CHANGE AND *MEDIUM TO HIGH* REGULATORY RISK:

Some EU countries have regulatory frameworks and standards that are not aligned with best-in-class member states, notably those in Eastern Europe. Romania and the Czech Republic have a low level of ESG-related regulatory measures and frameworks. The Czech Republic in particular does not have any pension fund regulation regarding ESG, nor a stewardship code. In terms of disclosure requirements, none of the regulatory frameworks in Slovakia, Hungary, and Poland require pension funds to disclose their approach regarding ESG investing. Albania, which is set to accede to the EU, also lacks disclosure regulation.

3. COUNTRIES WITH A *HIGH* PENSION FUND VULNERABILITY TO CLIMATE CHANGE AND *LOW* REGULATORY RISKS:

These countries have a high level of ESG-related regulatory measures and frameworks. This category includes Brazil, the Netherlands, South Africa, and the United States. The high level of ESG integration is often related to regulatory tradition and historical development. The more profoundly the ESG concept is rooted in the public's awareness and the earlier codes have come out, the more advanced later regulation is. For example, socially responsible investing (SRI) is deeply rooted in the South African market. In fact, some of the earliest records of such investments date back to the Apartheid boycott of South African companies. Initiatives such as the King Code on Corporate Governance (revised repeatedly from 1994 to 2017) have also played a role. As awareness of the importance of ESG issues has grown, so has investor demand for greater transparency.

> > >

BOX 2 - South African Sustainable Finance Regulatory Framework

- **Circular 130 (2007)**, created by the financial regulatory agency, provides guidance on how to include responsible investment policies and suggests that risk management should not be limited solely to financial aspects.
- **The revised Regulation 28 of the Pension Fund Act** (effective in 2011) states that pension funds should address all factors (including ESG) that may affect an investment on the long term.
- **CRISA – the Code for Responsible Investing in South Africa** (2011) encourages the entire investor community to implement ESG components of the regulation 28 as long as other aspects belonging to international voluntary codes (e.g. UN-PRI). It also requires investors to consider the King Report on Corporate Governance South Africa (King III) with regard to the principles for governance structures and sustainable operations.
- **4th iteration of the King Code (2016)** underlines that institutional investors are compelled to implement an active engagement strategy.

4. COUNTRIES WITH *MEDIUM* TO HIGH PENSION VULNERABILITY TO CLIMATE CHANGE AND AN IMPROVING, BUT *MEDIUM TO HIGH*, LEVEL OF REGULATORY RISK

These countries have been steadily improving their level of ESG-related regulatory measures and frameworks. They are not geographically concentrated. This category includes some Asian countries like Japan, Malaysia, some Latin American countries like Chile. In Japan, the strong central government impetus will mean that any regulation will be government driven. According to the Chilean pension regulatory agency, Chile has just started to implement ESG integration at the national level. As of yet, they do not have any explicit regulations or guidelines related to climate change or ESG factors. However, since hosting COP25 last year, Chile has started the regulation design process. Led by the Ministry of Finance, pension fund administrators and other financial sector representatives signed a green agreement to establish a working plan beginning in 2020. The agreement defines a series of specific commitments to incorporate ESG guidelines and considerations and to manage the risks and opportunities associated with climate change.

> > >

BOX 3 - Sustainable Finance Regulatory Framework Japan

The Japanese State pension fund, the GPIF, is leading the sustainable investment agenda for pension funds, along with significant changes in the regulation. In 2014, Japan became one of the first markets in Asia to adopt a Stewardship Code. The seven-principle code aimed to encourage investors to promote sustainable returns and growth through the use of shareholder voting and engagement. In 2017, the amended Code explicitly asked signatories to consider medium- to long-term sustainability criteria in their engagements, including ESG factors, and required institutional investors to disclose the rationale of their vote to combat conflicts of interest in voting decisions.

In 2017, the Japanese Ministry of the Environment released green bond guidelines, which boosted green issuances from four to eleven in one year. Continuing on this path, the High-Level Meeting by the Government on ESG Finance in 2018 led to the report entitled "Toward becoming a big power in ESG finance". This ambitious publication included a set of non-binding recommendations on climate disclosure, engagement, regional ESG finance, ESG literacy, and development of ESG products across asset classes.

3.2 Survey

To supplement the regulatory map, a survey of pension supervisory authorities was undertaken, which aimed to identify how each supervisory authority is interpreting global best practices and standards on ESG integration in the pension industry. The International Organisation of Pension Supervisors (IOPS)[50] released their 'Supervisory guidelines on the integration of ESG factors in the investment and risk management of pension funds' in 2019.[51] The ESG guidelines provide voluntary guidance to regulators, supervisors, and other entities who supervise the consideration of ESG factors in the investment and risk management processes of pension funds. In terms of environmental risk, the guidelines consider physical, transition, and liability risks to be material. This is in addition to social risk, e.g. child labor and slavery, health and safety, discrimination, and governance risk, e.g. executive pay issues, bribery and corruption. The guidelines are divided into four sections: overall consideration of ESG factors, integration of ESG factors, disclosure of ESG factors, and scenario of investment strategies. A summary of the guidelines is included in the appendix (see appendix 3).

The survey reflected the IOPS guidelines and their structure. In order to effectively capture the current ESG trends at both the policy and practice level, the survey was divided into two sections: Section I Regulatory Framework and Section II Market Practice. Section I examined whether, and if so how, each supervisory agency incorporates ESG factors into its regulatory framework on areas including investment methodologies, risk assessment, stress-testing, and disclosure of information. Several questions focused on details of the regulatory agency's efforts on ESG factors such as providing guidance on ESG disclosure and ESG reporting standards to pension funds under its jurisdiction. Section II focused on the pension funds under each regulatory agency's jurisdiction, specifically on their practices towards ESG factors, green investing, climate-related risks and investment as well as the main barriers to incorporating ESG factors. The survey is t beneficial in two ways: i. the written portion of the survey, in which many supervisors highlighted relevant laws and regulations in their jurisdictions, allowed for the identification of clear trends in pension regulation as it pertains to ESG factors; ii. as the survey closely follows the IOPS guidelines, the survey can serve as a tool for further research and/or monitoring the implementation of the guidelines.

50. The IOPS is an independent international body that cooperates closely with the OECD, the World Bank, International Social Security Association (ISSA), International Association of Insurance Supervisors (IAIS), and the IMF. Its overarching goal is to support effective supervision of private pension systems worldwide. Its main objectives are to: serve as a pension supervisory standard-setting body; facilitate international cooperation; promote the implementation of international standards; and assist countries with less developed private pension arrangements. The IOPS currently has 90 Members and Observers, representing members from 79 jurisdictions and territories. For further information see www.iopsweb.org
51. http://www.iopsweb.org/iops-supervisory-guidelines-esg-factors.htm

FINDINGS

The survey received 18 responses:[52] Angola, Australia, Austria, Bulgaria, Chile, Colombia, Guernsey, Iceland, Ireland, Kenya, Malawi, Mexico, Namibia, North Macedonia, Romania, Slovakia, South Africa, and Uganda. The respondents' income classification is shown in the figure below.

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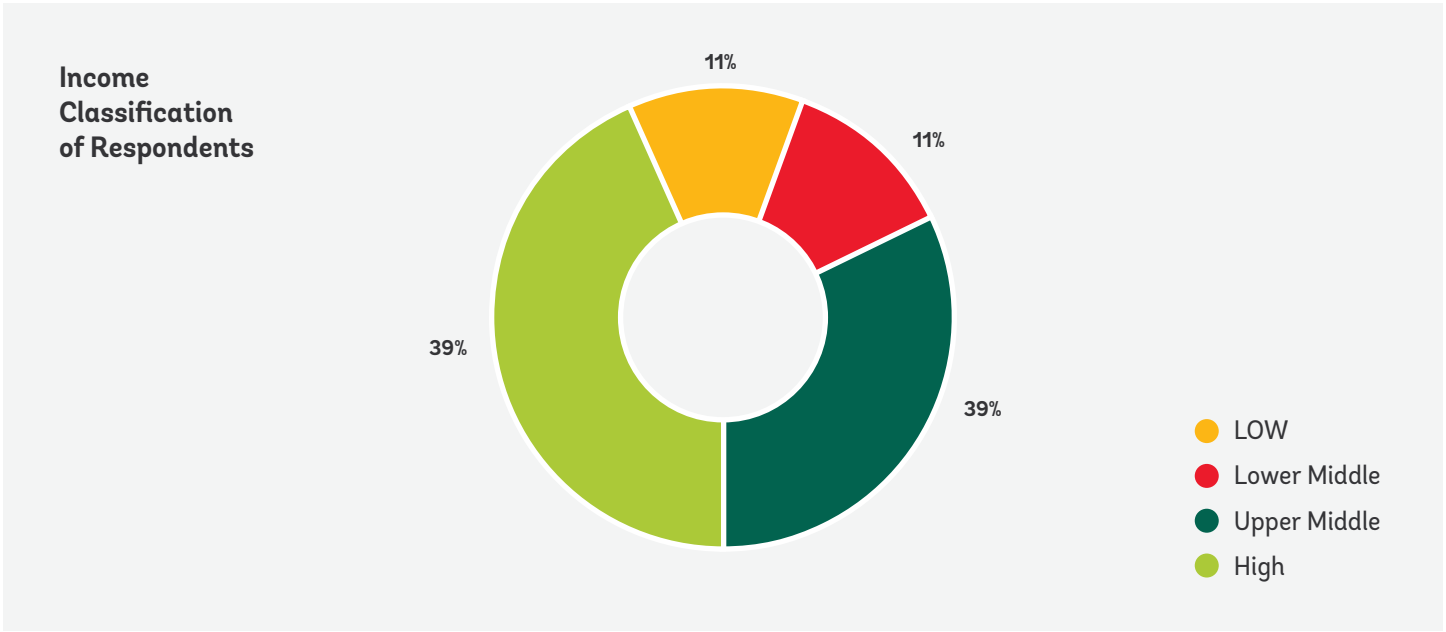
FIGURE 9 - Income Classification by World Bank Income Groups



SECTION I. REGULATORY FRAMEWORK

The survey allowed for the mapping of various regulatory frameworks which lay out how to consider and incorporate ESG factors into investment-processes. The following implementation patterns were identified. (See Figure 10).

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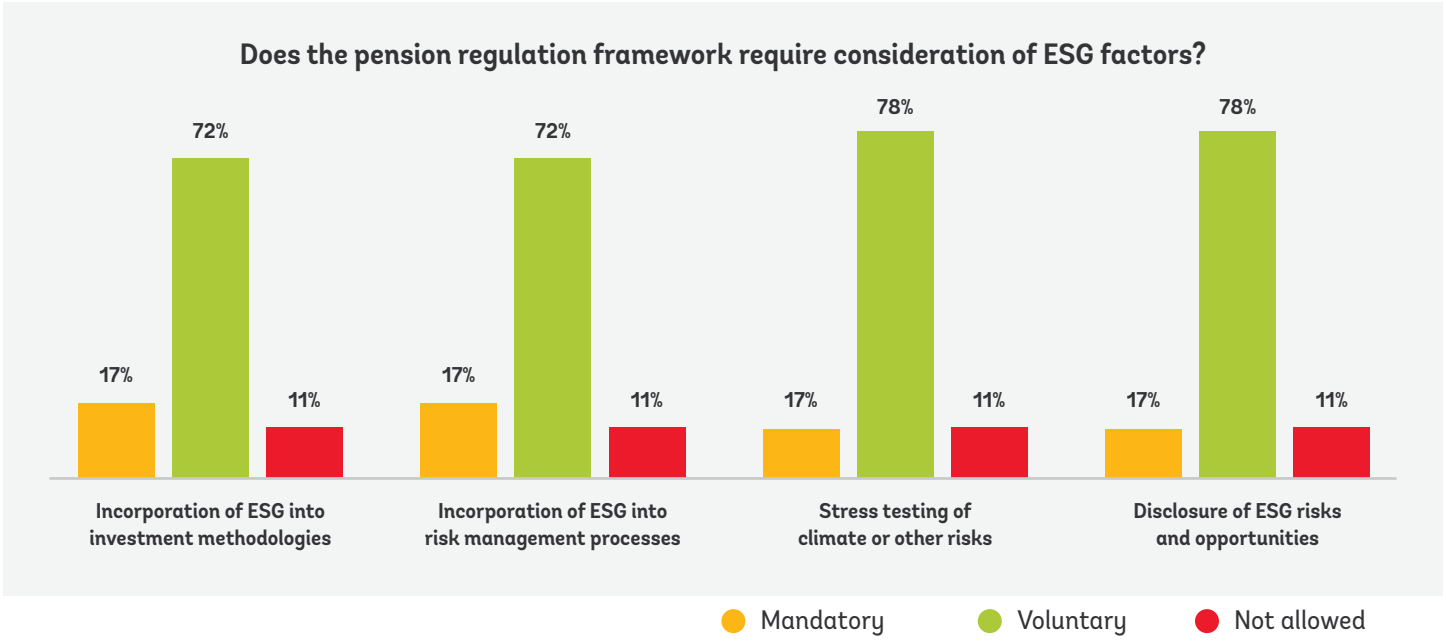
FIGURE 10 - Types of ESG regulations implemented



52. The IOPS Secretariat, in coordination with the client, administered the circulation and participation of the survey. The full survey questionnaire is available under the appendix of this report (appendix 2). In total, the survey contained 15 questions with estimated time-to-complete of under 20 minutes. Due to the COVID-19 pandemic, the survey received fewer responses than expected.

- **ESG integration: Pension supervisors overwhelmingly reported that ESG integration is voluntary in their jurisdiction.** Only 22 percent of the respondents had at least one mandatory requirement on ESG consideration in either investment methodology, risk management, or disclosure. One country reported mandatory consideration of all three categories. Seventy-two percent reported that all current ESG regulations are voluntary, though many EU countries indicated that they had either already or will soon transpose the IORP II directive into mandatory national law. Among those who adopted a mandatory or voluntary ESG framework, it was common to consider ESG factors in investment decisions and reporting. Some of them also assess ESG factors in risk management. Only two respondents, one in Africa and the other in Latin America, specifically defined ESG integration as inconsistent with fiduciary duty. Finally, there was no significant difference in uptake of ESG regulations between low- and high-income countries.
- **ESG guidance: The majority of supervisory agencies provided no guidance on ESG integration into investment management and disclosures. None had reporting standards for green investments.** Overall, 77 percent of the jurisdictions reported that they did not provide guidance on ESG investment management and 72 percent reported that they did not provide guidance on ESG disclosure. Among those that provided investment guidance, guidance on risk management and stress-testing was most prevalent. All who provided disclosure guidance required disclosing ESG investment policy to the supervisory authority itself, while some also required reporting to members and stakeholders. Most glaringly, however, no jurisdiction had implemented any type of reporting or labeling of green investment including green taxonomies, label bonds, green loans, or other investment labeling. However, this is bound to change with the recently published EU taxonomy recommendations. Finally, 84 percent of the respondents indicated that they had no requirements on ESG considerations when awarding mandates or monitoring external managers, though half of those indicated they had plans to implement such guidelines.
- **ESG-related networks: Most supervisory authorities reported that pension funds in their jurisdiction had not joined any international ESG-related networks, or that they did not collect information about these partnerships.** The United Nations Principles for Responsible Investment (UN PRI) was most cited for those that belong to a network.

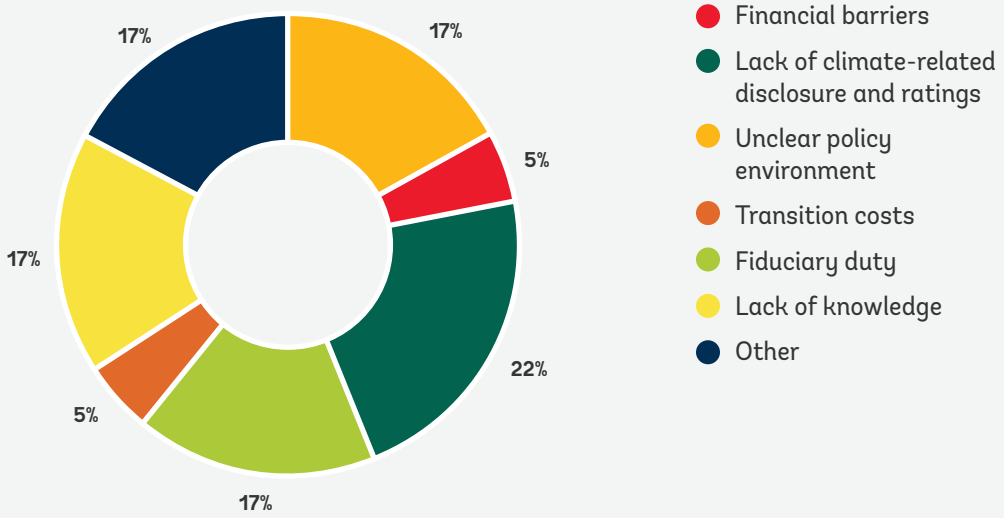
SECTION II. MARKET PRACTICE

The survey then went on to examine how ESG factors are being incorporate by pension markets in practice. The following outline the main findings (see Figure 11):

> > >

FIGURE 10 - Main barriers to ESG incorporation

What is the main barrier to incorporating ESG factors into investment decisions for the pension funds in your jurisdiction?



- **Main drivers to green investment: Performance is the main driver for pension funds to pursue green investments, followed closely by diversification and sustainability.** Some respondents indicated that the importance of ESG factors should be balanced against the adequacy of pensions and insulation of pension savings from inflation.
- **Main barriers to green investment: The four most important barriers to greening investment were fiduciary duty; unclear policy environment; lack of climate-related disclosure and unreliable ratings; and lack of ESG-specific knowledge and data.**[53] The overall barriers reported by pension supervisors can be divided as follows:
  - » Structural barriers: unclear policy environment (e.g. inconsistency in policy) and lack of standards and certification.
  - » Financial barriers: fossil fuel subsidies, unpriced carbon externality, and transaction costs due to the size of green bonds.
  - » Technical barriers: lack of common taxonomy, analysis and methodology as well as knowledge and data for ESG investments. Legal barriers: some respondents also indicated fiduciary duty as the main barrier. The findings of the survey and literature review reveal that regulators and managers have a very extensive definition of intentionality. The assumption that fiduciary duty is only about maximizing financial returns ignores other important considerations that affect this same financial efficiency. Fiduciary duty on one hand, and intentionality about environmental and social considerations on the other hand are not mutually exclusive. Research increasingly shows that accounting for environmental factors positively impacts financial performance, notably by minimizing downside risk.[54]
- **Climate-risk considerations: Most respondents reported that pension funds in their jurisdiction did not consider climate change risks separately from overall ESG considerations.** Among six respondents whose pension funds consider climate issues separately, most do so in their reporting or investment decision-making. Only two respondents indicated that pension funds in their jurisdiction conducted climate-specific scenario analysis. The written responses indicated a clear trend among pension supervisors; many recognize that climate risk identification and management frameworks must evolve in the future.
- **Engagement with companies: Those pension funds that engage with companies regarding ESG are likely to promote company disclosure and encourage companies to reduce externalities.** However, a majority of the respondents reported that pension funds in their jurisdiction did not engage with companies on climate change at all. Of those that did, three requested improved climate disclosures, and only one actively engaged in proxy voting.

CONCLUSION

The regulatory map and survey results, considered together, indicate several trends.

- First, the responses indicated that the current level of ESG integration remains limited and divergence exists from regulatory guidance. More often than not, ESG consideration was voluntary. All EU countries indicated that they were in the process of transposing IORP II. Consistent with the regulatory map, it was observed that older EU members had pre-existing national ESG legislation, while newer members had not yet or only recently started regulating ESG issues.
- Second, the responses in the market practice section indicated that pension funds in many jurisdictions did not consider nor engage with companies on climate risks separately from overall ESG risks. The pension supervisors attributed the lack of green investment to barriers including a lack of environmental policy support, regulatory disincentives, lack of appropriate investment vehicles and market liquidity, transaction cost issues, and a lack of knowledge, track record, and expertise among pension funds regarding ESG investments and their associated risks.
- Third, among countries with medium to high pension climate risk, levels of regulatory improvement differed dramatically. Some countries in this category had immediate plans to implement guidance on ESG investment management and disclosure, whereas others still legally prohibited ESG incorporation for pension funds. South Africa is notable as the country with the highest climate vulnerability score, but also a highly robust and established mandatory ESG framework. This is consistent with our observation that countries that do not have an urgent climate threat have been slow to act, while those who do have been quick to act on regulation.

Overall, there is significant interest in and a trend towards developing new regulations to assist and encourage pension funds to integrate ESG considerations. To tap into this source of capital, pension supervisors have a role to play in enhancing the availability of attractive opportunities and instruments to pension funds. The solutions may include regulatory support to develop new investment vehicles for desired risk-return profiles, improved knowledge and training, and the consolidation of pension funds. Additionally, many of the countries that had both high climate risk and high regulatory risk did not respond to the survey, including Israel, Nigeria, Pakistan, India, Singapore, and Malaysia. We would recommend that the IOPS administer the survey to these jurisdictions to track their progress on global ESG guidelines.

53. For this section, the team manually matched write-in responses with the closest possible multiple choice option.
54. Clark et al (2015)

4.

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Conclusions and recommendations

As institutional investors, pension funds play a critical role in the low-carbon climate resilient pathway. Endorsing this role means aligning their definition of fiduciary duty with contemporary expectations: promoting ESG considerations and achieving financial returns. In the context of rising risks and opportunities posed by climate change, pension funds have to reinvent themselves to account for their global presence. The analysis from this report recommendations several actions to accelerate this change.

1. **Review investment guidelines to allow for appropriate levels of international diversification.** *Regulators should review pension fund investment guidelines to check that they do not inadvertently exposure pension funds to high levels of domestic climate risk.* Investment guidelines should be set appropriately to recognize local capital market and pension systems conditions.
2. **Adopt a holistic definition of fiduciary duty, fully aligned with today's challenges.** Policy makes should *revisit pension funds' definition of fiduciary duty, in line with financial, environmental, social and good governance imperatives to allow climate change and other risks to be dealt with appropriately.*
3. **Build ESG literacy and awareness.** *Regulators should develop their own knowledge and measurement of climate and other ESG risks and offer and promote educational tools and incentives to allow* pension funds to develop a robust internal expertise on climate and other ESG-related considerations. Greening a pension system involves developing awareness and expertise within the pension funds regarding climate change (e.g. drivers of vulnerability and of exposure by sector, level of readiness; TCFD requirements) and ESG considerations (e.g. materiality by sector, key metrics, regulatory guidelines). The survey for this report found that many regulators and the pension funds their oversee still do not feel they have the enabling environment to make such moves and adopt such practices.
4. **Encourage sharing and adopting sustainable finance best practices.** Pension supervisory authorities could *take a stronger and common stance on sustainable finance practices, including ESG disclosure and reporting, including through the regulatory framework led by* IOPS and supported by a global coalitions of pension funds. The research conducted for this report suggested that pension regulators and looking to international networks and organizations such as the IOPS and the World Bank to provide them with a better understanding of ESG issues – including how to apply international good practices and standards in a proportionate and appropriate way in their own jurisdictions. The analysis conducted suggests that this support is needed as there is gap in some countries between the potential climate risks which pension funds in face and the regulatory and other mitigation factors which are being taken to address and mitigate these factors.

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Appendixes

Appendix 1: Case Studies

To gain insight into how individual pension funds were crafting their sustainable investment strategies within existing climate risk and regulation frameworks, the team conducted extensive desk review and a series of interviews with pension fund administrators. The resulting case studies will be featured in a separate report. However, the conclusions we drew from these case studies were essential to the analysis in this report and are thus included below. The pension funds profiled were as follows:

Country	Pension Fund
Canada	Canada Pension Plan Investment Board (CPPIB)
Japan	Government Pension Investment Fund (GPIF)
The Netherlands	Stichting Pensioenfonds ABP (ABP)
Norway	Government Pension Fund of Norway (GPFG)
United States	New York State Common Retirement Fund (NYSCRF)

Overall, these case studies were drawn from a pool of pension funds that were relatively similar in asset size and all came from high income economies. Notably, each pension did have a specifically articulated climate strategy that was separate from its overall ESG strategy, which indicates that pension funds are paying attention to greening.

Implementation of pension fund greening varied widely on:

- **Regulatory environment** ranged from those in heavy-touch (GPIF, ABP) to light touch regulatory environments (NYSCRF). Thus, the funds were likely able to execute their climate strategy regardless of the regulatory environment because of their prominence as large asset holders, and their strongly established internal investment processes. Smaller funds, however, will lag behind without the implementation of clear regulations.
- **Climate investment strategies** ranged from emissions focused (GPIF), to more holistic environmental considerations that included natural capital (ABP, GPFG). Pension funds that are focused solely on energy efficiency and emission-reductions could be missing climate opportunities in the adaptation space.
- **Quantitative climate goals and disclosures** were lacking for almost all funds. Though each fund had a well-articulated climate strategy that included specific objectives, many failed to define these objectives in numeric terms, such as CPPIB and NBIM. Often, they did not report how they were greening each asset class.

Appendix 2: Survey questionnaire

SECTION I. REGULATORY FRAMEWORK

1. Does the pension regulation framework require consideration of ESG factors? If so, in what form? Please check all that apply. *

Check all that apply.

	Not allowed	Voluntary	Mandatory
Incorporation of ESG into investment methodologies	☐	☐	☐
Incorporation of ESG into risk management processes	☐	☐	☐
Stress testing of climate or other risks	☐	☐	☐
Disclosure of ESG risks and opportunities	☐	☐	☐

Please describe the relevant regulatory framework:

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2. Does your supervisory agency provide guidance to pension funds on integrating ESG factors into the investment process? Please check all that apply. *

Check all that apply.

- ☐ Yes, guidance on analyzing ESG factors
- ☐ Yes, guidance on inclusion and exclusion criteria
- ☐ Yes, guidance on incorporating ESG factors into risk management and stress-testing
- ☐ No guidance

Please describe the guidance you are providing on ESG integration in detail, or the reason there is insufficient guidance:

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3. Does your supervisory agency provide guidance to pension funds on ESG disclosure? Please check all that apply. *

Check all that apply.

- ☐ Yes, guidance on disclosure to pension supervisory authority
- ☐ Yes, guidance on disclosing substantial financial factors, including ESG, to members and stakeholders
- ☐ Yes, guidance on disclosing sustainability factors, including ESG factors, stewardship, and other non-financial factors to members and stakeholders
- ☐ No guidance

Please describe the guidance you are providing on ESG disclosure in detail, or the reason there is insufficient guidance:

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4. Are there reporting standards for ESG and green investments which are used by the pension funds in your jurisdiction as part of their investment process? Please check all that apply. *

Check all that apply.

- [ ] Green taxonomy
- [ ] Label bond standards (green/sustainable bonds etc.) Green/sustainable loan standards
- [ ] Other investment product labeling
- [ ] Other: _____

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5. Does your supervisory agency have any guidelines or requirements in place for the pension funds to consider ESG factors when awarding mandates and monitoring their external asset managers? Please choose one answer. *

Mark only one oval.

- ◯ There are strict requirements imposed on the activities of external managers
- ◯ There are guidelines for monitoring the activities of external managers but they are not mandatory
- ◯ There are no requirements at present but there are plans to implement requirements in the near future
- ◯ There are no requirements and no plans to implement requirements

Please describe the guidance you are providing on ESG integration in detail, or the reason there is insufficient guidance:

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6. Have the pension funds under your supervision joined or planned to join SASB, TCFD, or the UN-convened Net-Zero Asset Owner Alliance? Please check all that apply. *

Check all that apply.

- [ ] SASB (Sustainability Accounting Standards Board)
- [ ] TCFD (Task Force on Climate-related Financial Disclosure)
- [ ] United Nation-convened Net-Zero Asset Owner Alliance
- [ ] None of them
- [ ] Other: _____

SECTION II. MARKET PRACTICE

7. What is the main driver for the pension funds in your jurisdiction to engage in greening investment? P lease choose one answer. *

Mark only one oval.

- ☐ Performance
- ☐ Sustainability
- ☐ Stability
- ☐ Diversification
- ☐ Public
- ☐ Independence
- ☐ Benefit
- ☐ Transparency
- ☐ Liquidity
- ☐ Other: _____

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8. What is the main barrier to incorporating ESG factors into investment decisions for the pension funds in your jurisdiction? Please choose one answer. *

Mark only one oval.

- ☐ Financial barriers (e.g. fossil fuel subsidies, unpriced carbon externality)
- ☐ Fragmentation (e.g. smaller scale of low carbon technologies)
- ☐ Trust (e.g. lack of climate-related disclosure, unreliable ESG rating agencies)
- ☐ Unclear policy environment (e.g. inconsistency in policy)
- ☐ Transition costs
- ☐ Fiduciary duty
- ☐ Other: _____

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9. Which new asset classes do pension funds in your jurisdiction include in the portfolio that are sustainability-related? Please check all that apply. *

Check all that apply.

- ☐ Labeled green bonds
- ☐ Green infrastructure
  (e.g. electricity demand-side management technology, smart grids, coastal protection, water infrastructure, etc.)
- ☐ Green real estate (e.g. building complying with green standards)
- ☐ Sovereign bonds (ESG rated)
- ☐ Other: _____

Please describe the guidance you are providing on ESG integration in detail, or the reason there is insufficient guidance:

10. How do pension funds in your jurisdiction consider climate-related risks separately from ESG factors? Please check all that apply. *

Check all that apply.

- ☐ Incorporate climate-related risks into risk management (e.g. conduct stress test or scenario analysis)
- ☐ Incorporate climate-related risks into investment decisions (e.g. incorporate climate- related risks into inclusion or divestment criteria)
- ☐ Incorporate climate-related risks into reporting
- ☐ Do not consider climate-related risks

Please describe the guidance you are providing on ESG integration in detail, or the reason there is insufficient guidance:

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11. How do pension funds in your jurisdiction engage with the key companies in which they invest on the topic of climate change? Please check all that apply. *

Check all that apply.

- ☐ Exercise shareholder voting rights based on climate issues
- ☐ Engage with companies on requesting improved disclosure
- ☐ Engage with companies on how their business can reduce negative environmental externalities
- ☐ No engagement

Please describe the activities:

Appendix 3: IOPS Supervisory Guidelines on the Integration of ESG Factors

The guidance note addresses ten guidelines, which can be summarized as follows:

- Overall consideration of ESG factors
  - **Guideline 1:** supervisory authorities should require consideration of ESG factors, alongside any other financial factors, in their decision-making.
  - **Guideline 2:** supervisory authorities should clarify to pension funds and asset managers, possibly through regulations or rules, that taking ESG factors into account is consistent with fiduciary duty.
  - **Guideline 3:** supervisory authorities should clarify that if accounting for non-financial factors in any way sacrifices returns, pension funds must clearly communicate this to members.
  - **Guideline 4:** supervisory authorities should require that pension funds consider ESG factors, while pursuing their established risk-return objectives.
- Integration of ESG factors
  - **Guideline 5:** supervisory authorities should require pension funds to document and implement ESG integration in their investment policy. If pension funds choose not to pursue an ESG strategy, they should be required to document their choice.
  - **Guideline 6:** supervisory authorities should offer guidance to pension funds on how to analyze ESG factors.
- Disclosure of ESG factors
  - **Guideline 7:** supervisory authorities should require that pension funds report to them on how they integrate ESG factors into their risk and investment management.
  - **Guideline 8:** supervisory authorities should advise pension funds on how to report ESG factors, alongside other financially material factors, to their members and stakeholders.
  - **Guideline 9:** supervisory authorities should require that pension funds, in their investment policy, disclose to members and stakeholders how they plan to address ESG factors, stewardship, engagement, and any other non-financial factors.
- Scenario testing of investment strategies
- **Guideline 10:** supervisory authorities should encourage pension funds to develop adequate scenario testing of their investment strategy for all significant financial factors, including ESG.

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