



ASSESSMENT OF CLIMATE RISKS FOR THE FINANCIAL SECTOR

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Banco de Portugal

Prepared for:

“O setor bancário e os riscos climáticos e ambientais”

Banco de Portugal, Money Museum

12 March 2024

The opinions expressed in this presentation are those of the author and do not necessarily coincide with those of Banco de Portugal or the Eurosystem. Any errors and omissions are the sole responsibility of the author.

ASSESSMENT OF CLIMATE RISKS FOR THE FINANCIAL SECTOR

1 Addressing climate risks: key milestones

2 Assessing climate risks: surveillance framework

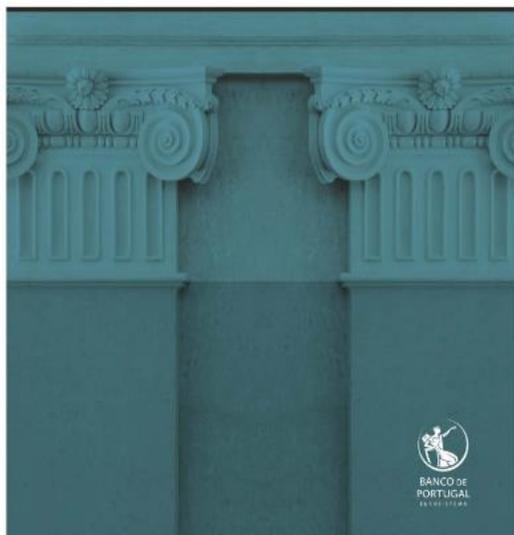
3 Challenges ahead

1. ADDRESSING CLIMATE RISKS: KEY MILESTONES

- The Economics of Climate Change, N. Stern (2007)
 - Global Risks, World Economic Forum (2011)
 - The Paris Agreement (2015)
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1. Breaking the tragedy of the horizon, Mark Carney (Sep 2015)
 2. Launch of the NGFS (Dec 2017)
 3. EC's Action Plan for a greener and clearer economy (Mar 2018)
 4. Supervisory expectations, BofE (Apr 2019)
 5. Guide to scenario analysis, Phase 1, NGFS (Jun 2020)
 6. Dashboard on insurance protection gaps for Nat Cat, EIOPA (Dec 2020)
 7. FSB WP-2021 incorporates climate finance and sustainable finance, FSB (Jan 2021)
 8. ECB economy-wide climate stress test, ECB (Sep 2021)
 9. Climate and environmental risks in the SSM 2022-2024 priorities (Dec 2021)
 10. ESAs provide clarity and tips to consumers on sustainable finance (Nov 2023)

1. ADDRESSING CLIMATE RISKS: KEY MILESTONES

RELATÓRIO ANUAL
SOBRE A EXPOSIÇÃO
DO SETOR BANCÁRIO
AO RISCO CLIMÁTICO



ASF
AUTORIDADE DE SUPERVISÃO
DE SEGUROS E FUNDOS DE PENSÕES

RERC

Relatório Anual de Exposição
ao Risco Climático

2023

Protection gaps na economia portuguesa

Um relatório do Nova SBE Finance Knowledge Center
Encomendado pela Autoridade de Supervisão de Seguros e Fundos de Pensões

NOVA Finance
Knowledge Center
NOVA SCHOOL OF
BUSINESS & ECONOMICS

Miguel A. Ferreira | Gonçalo Vieira da Luz | Eduardo Costa

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Dezembro 2022

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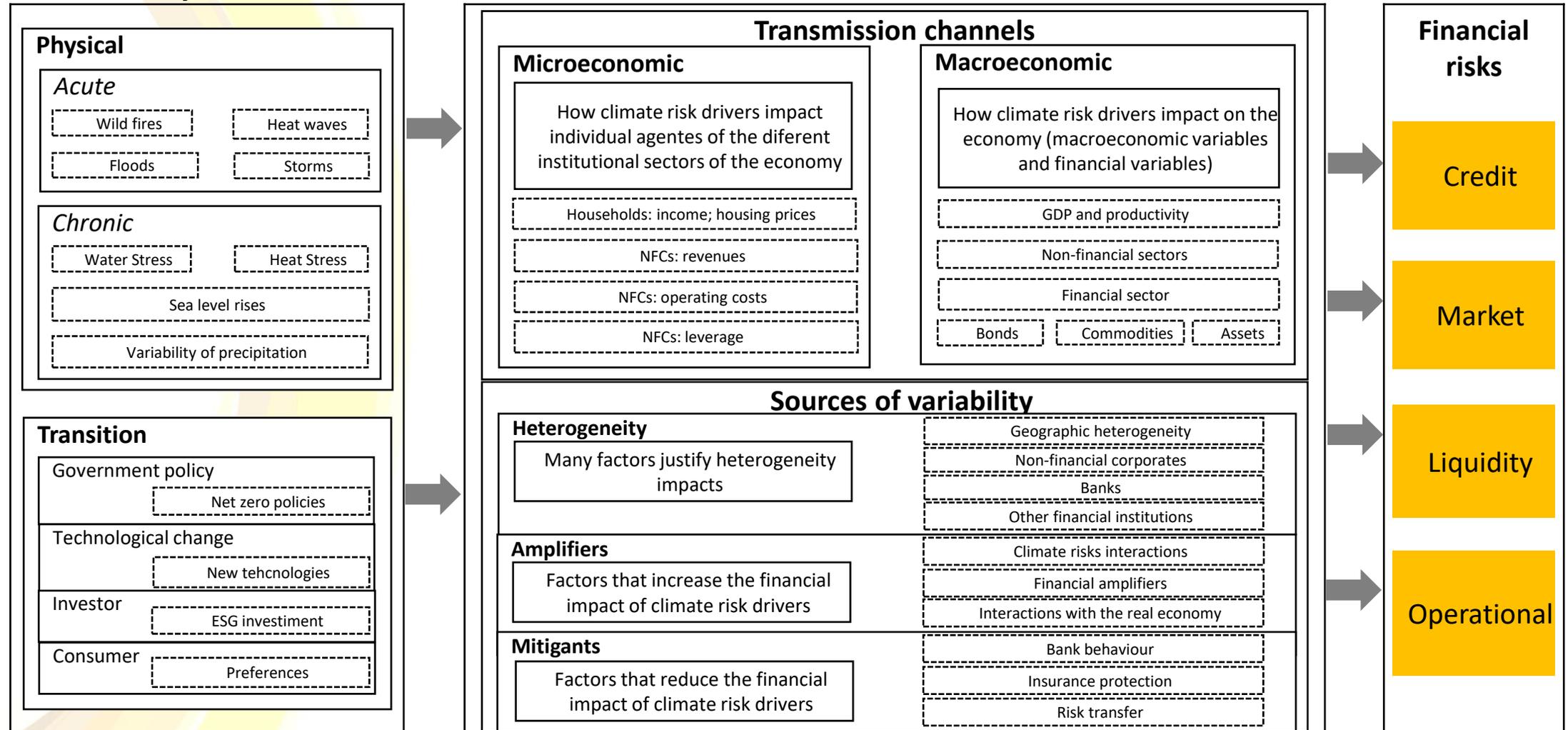
1 Addressing climate risks: key milestones

2 Assessing climate risks: surveillance framework

3 Challenges ahead

2. ASSESSING CLIMATE RISKS: SURVEILLANCE FRAMEWORK

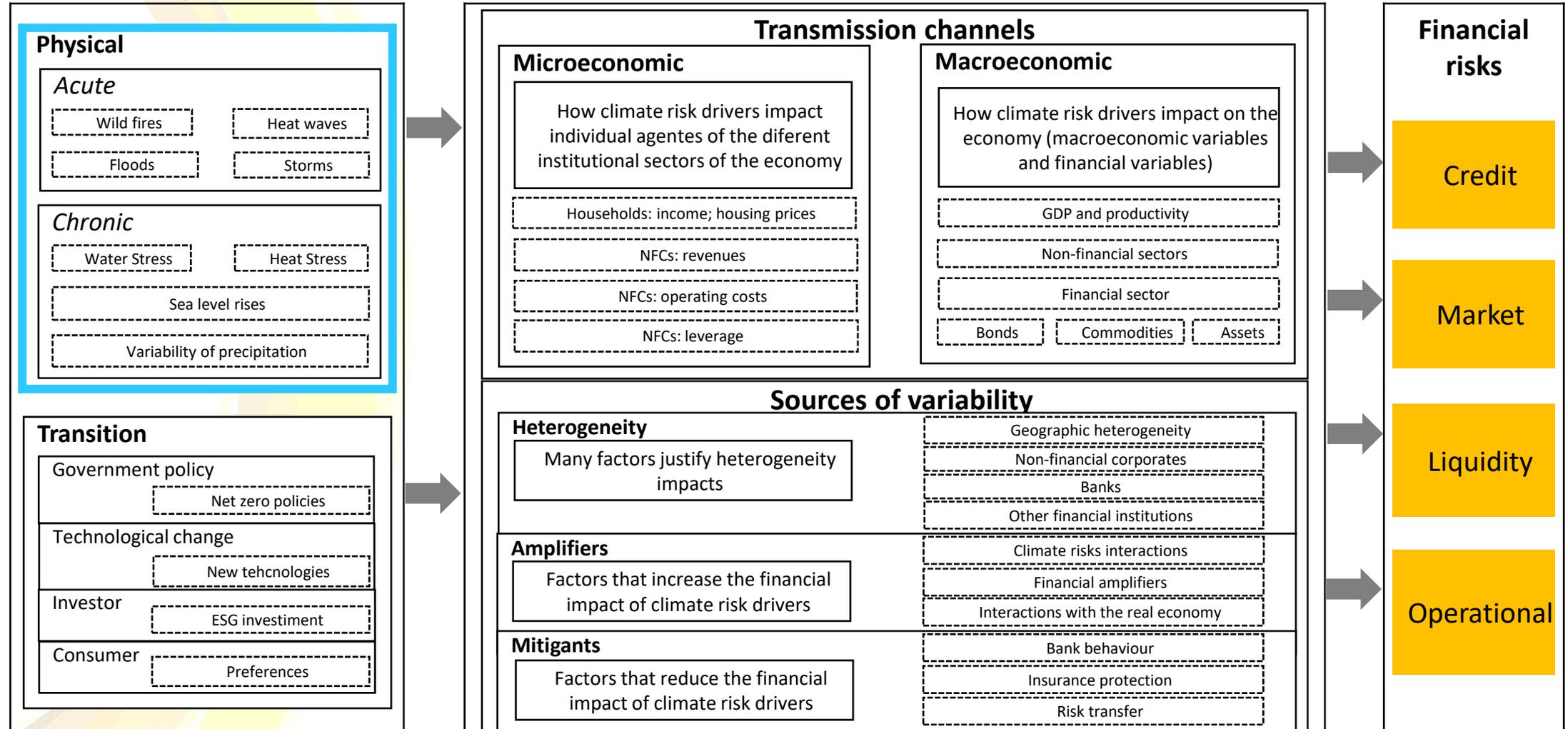
Climate related financial risks drives



Source: adapted from "Climate-related risk drivers and their transmission channels", April 2021, BCBS.

2. ASSESSING CLIMATE RISKS: SURVEILLANCE FRAMEWORK

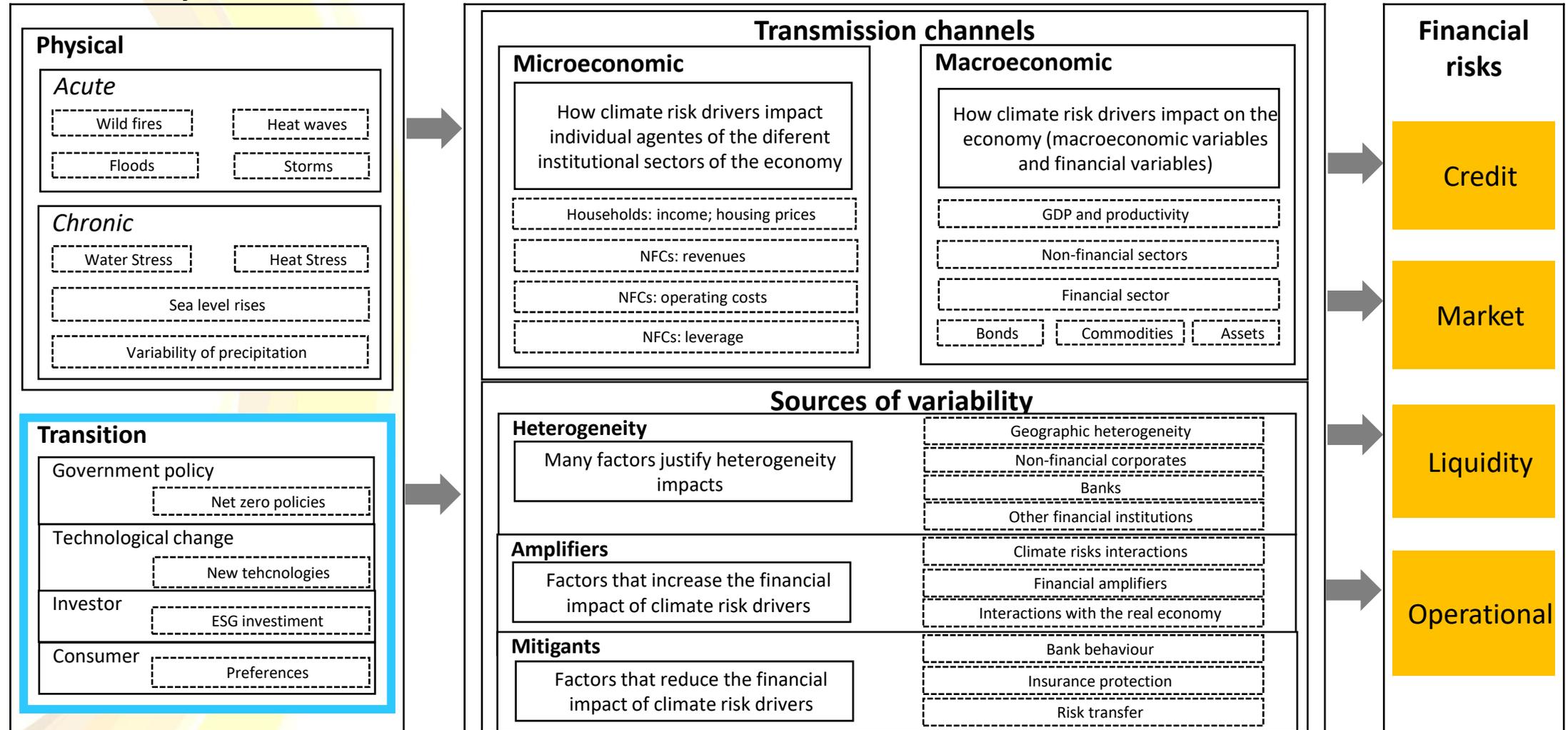
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2. ASSESSING CLIMATE RISKS: SURVEILLANCE FRAMEWORK

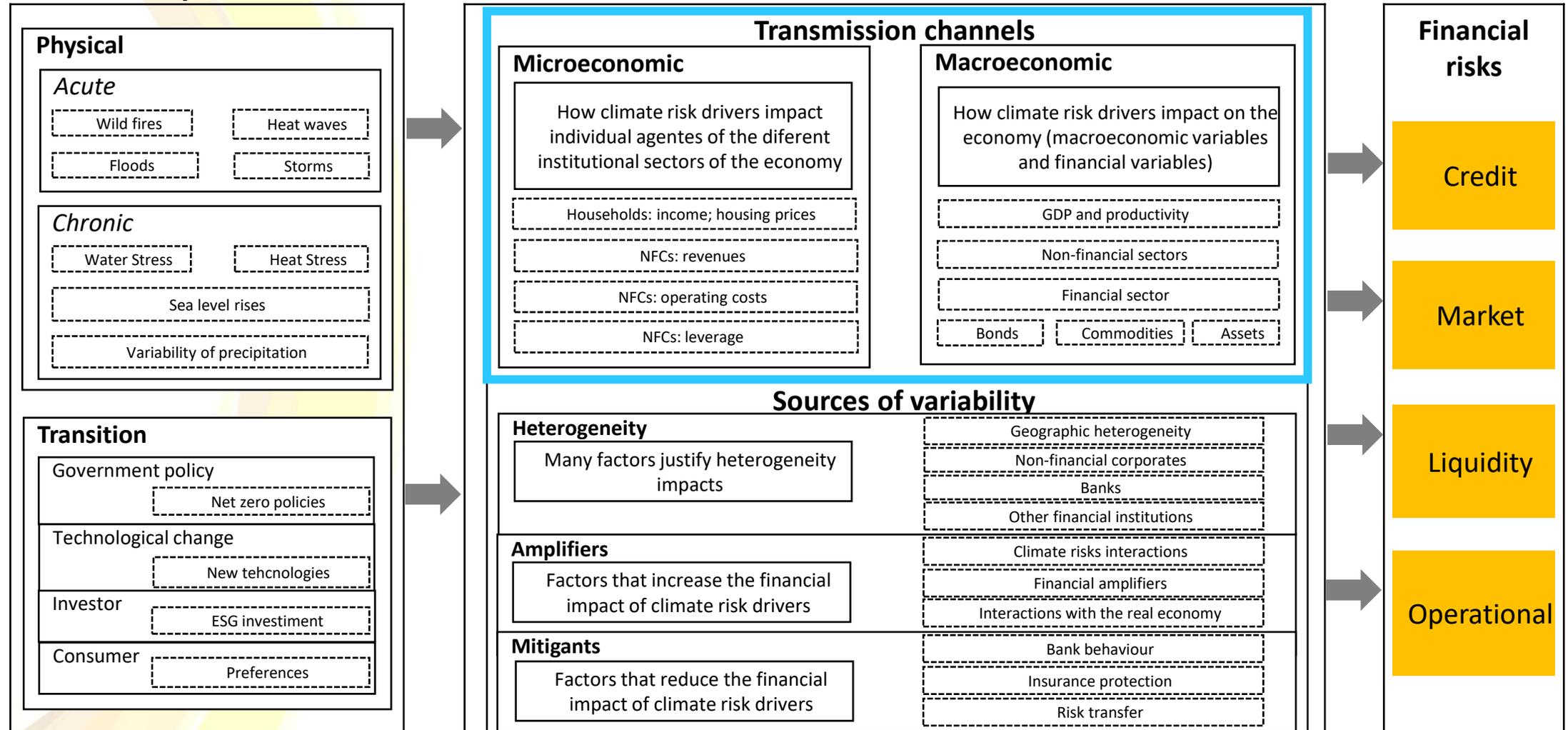
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2. ASSESSING CLIMATE RISKS: SURVEILLANCE FRAMEWORK

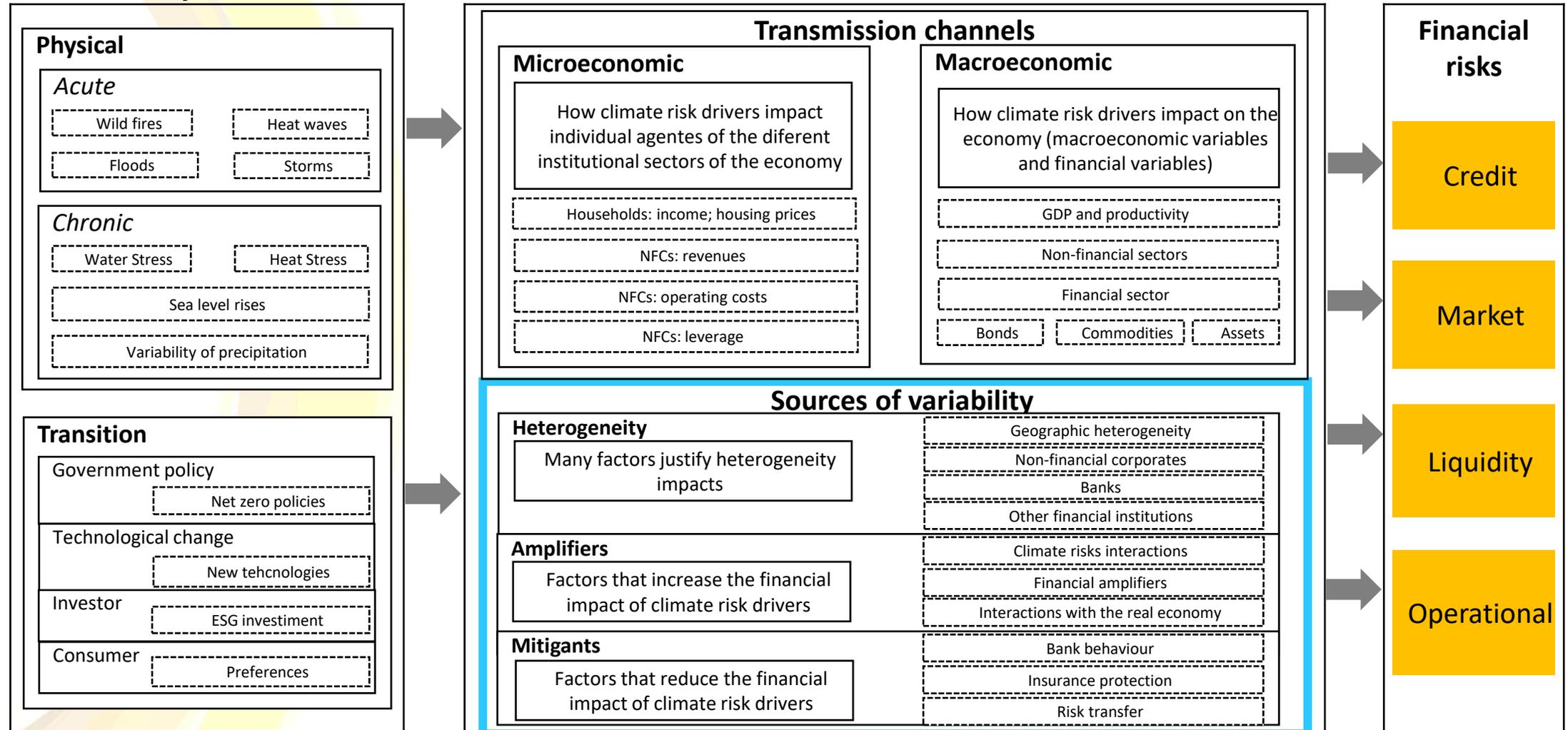
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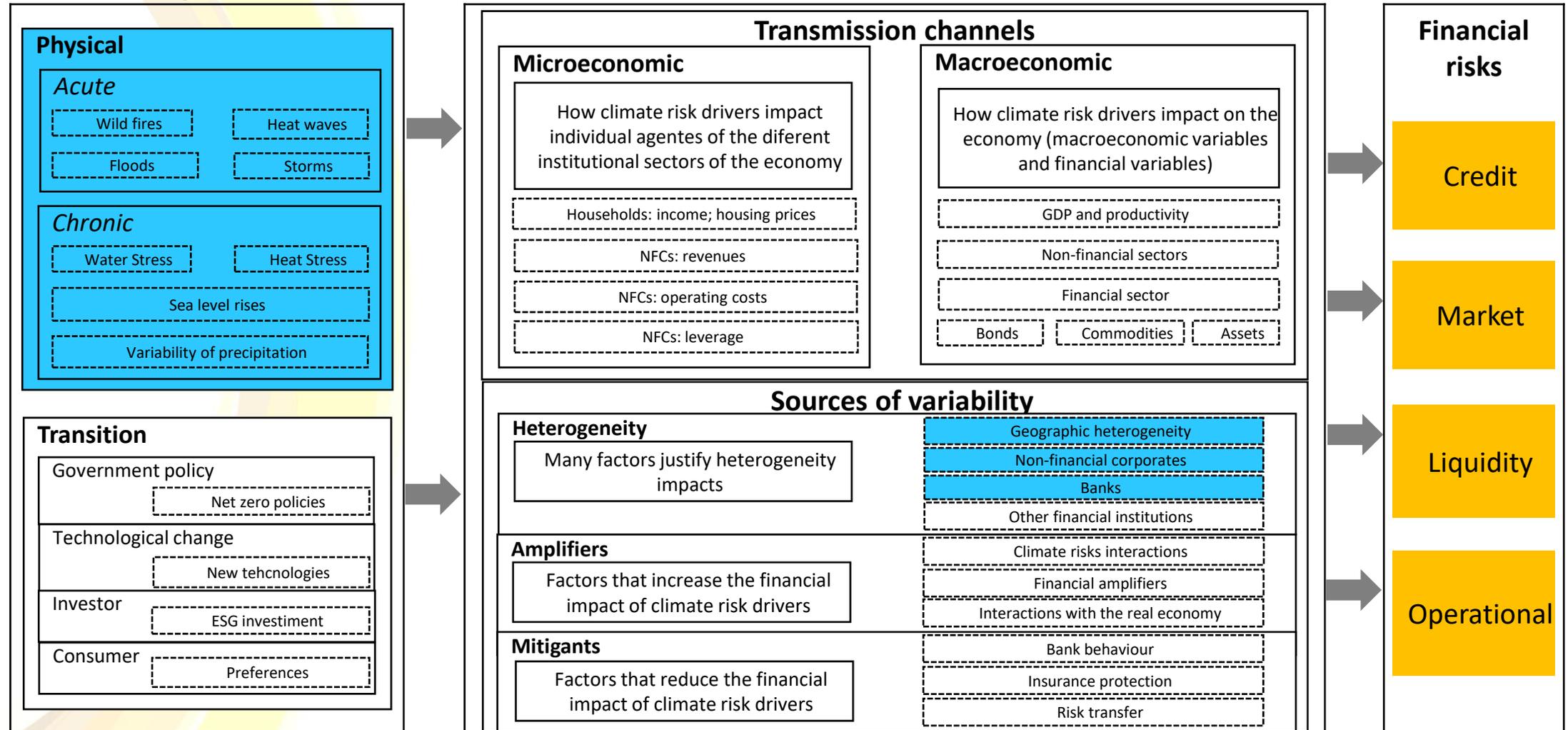
Mesuring climate-related risks

- Exposure metrics; Risk metrics

2. ASSESSING CLIMATE RISKS: SURVEILLANCE FRAMEWORK

Exposure and risks metrics for physical risks...

Climate related financial risks drivers



Source: adapted from "Climate-related risk drivers and their transmission channels", April 2021, BCBS.

Physical risks – exposure and risk metrics

*“Exposures to physical climate hazards are concentrated at the regional level (...) **riverine floods are the most economically relevant widespread climate risk driver in the EU over the next two decades. Wildfires, heat stress and water stress could have a strong impact on some regions**, possibly compounded by further stresses such as rising sea levels in the second half of this century (...) **only 35% of economically relevant losses on average are estimated to be currently insured in the EU**”.*

Climate-related risk and financial stability, (2021), ECB/ESRB Project Team on climate risk monitoring, July 2021.

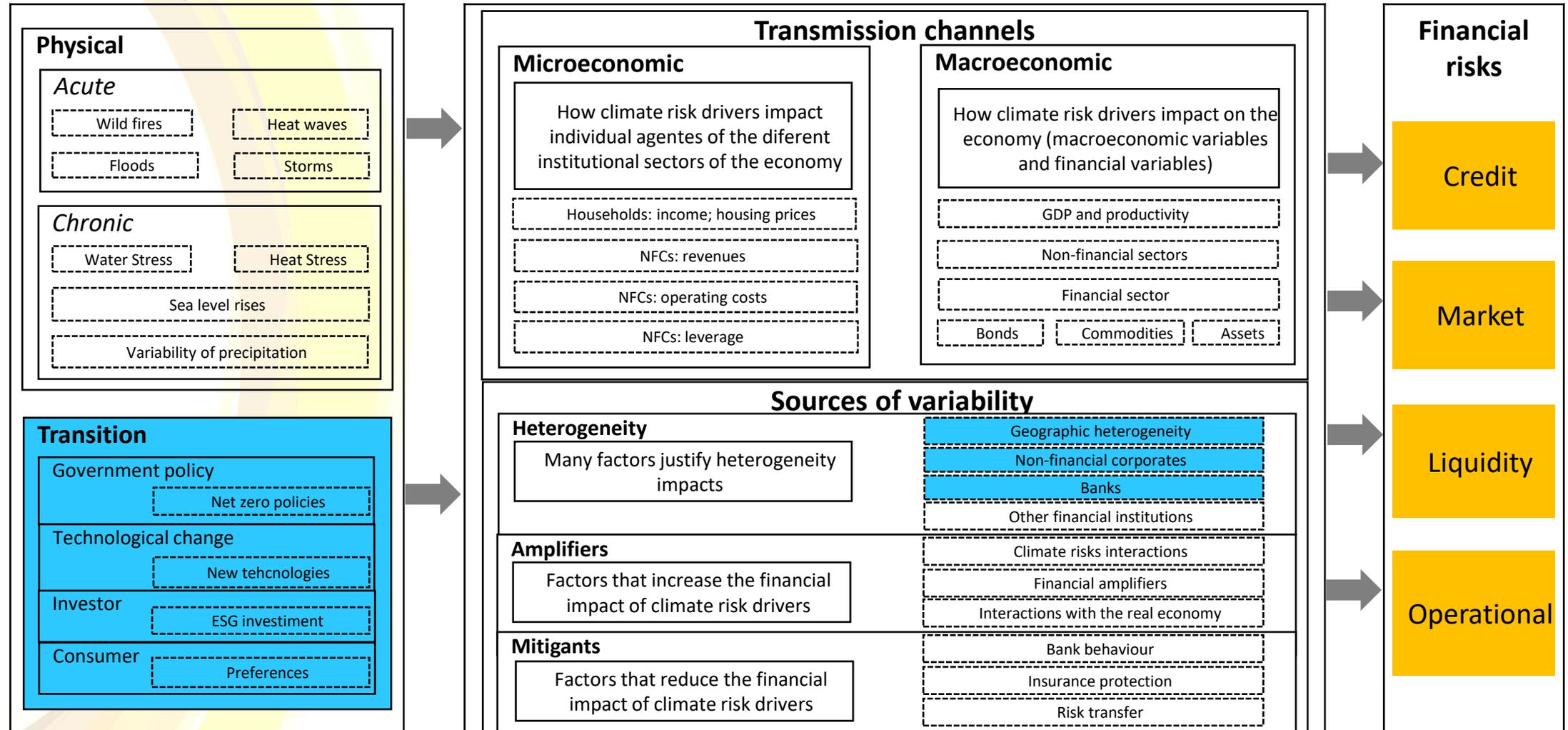
*“The results point to **a more significant exposure of the domestic banking sector – through credit granted – to firms vulnerable to water stress, heat stress and wildfires. The banking sector’s exposure to events with the highest level of risk (severe) is quite limited and is only relevant in the case of heat stress. The interaction of the banking sector’s exposure to the firms most vulnerable to the materialisation of physical risks with credit quality shows no sign of increased concentration risks.**”*

Annual report on the banking sector’s exposure to climate risk, (2023), Banco de Portugal.

2. ASSESSING CLIMATE RISKS: SURVEILLANCE FRAMEWORK

Exposure and risks metrics for transition risks...

Climate related financial risks drivers



Source: adapted from "Climate-related risk drivers and their transmission channels", April 2021, BCBS.

Transition risks – exposure and risk metrics

*“Banking sector loan-weighted emissions of non-financial corporates have registered a limited decline since 2015, amid **lower sectoral emissions accompanied by portfolio shifts to less emitting sectors.** These exposures have remained **strongly heterogeneous across countries.**”*

The macroprudential challenge of climate change, (2022), ECB/ESRB Project Team on climate risk monitoring, July 2022.

*“Indicators reflecting the banking sector’s exposure to transition risks, according to the activity sectors’ GHG emissions, show a decreasing trend over the most recent period. **These indicators place Portugal in an intermediate position in the euro area context.**”*

The average credit risk of the sectors that, due to their activity, will tend to be negatively affected by the climate transition process is close to, but lower than, the credit risk of the NFCs loan portfolio. Thus, there is no concentration of loans with higher credit risk in the sectors likely to be negatively affected by the climate transition process”.

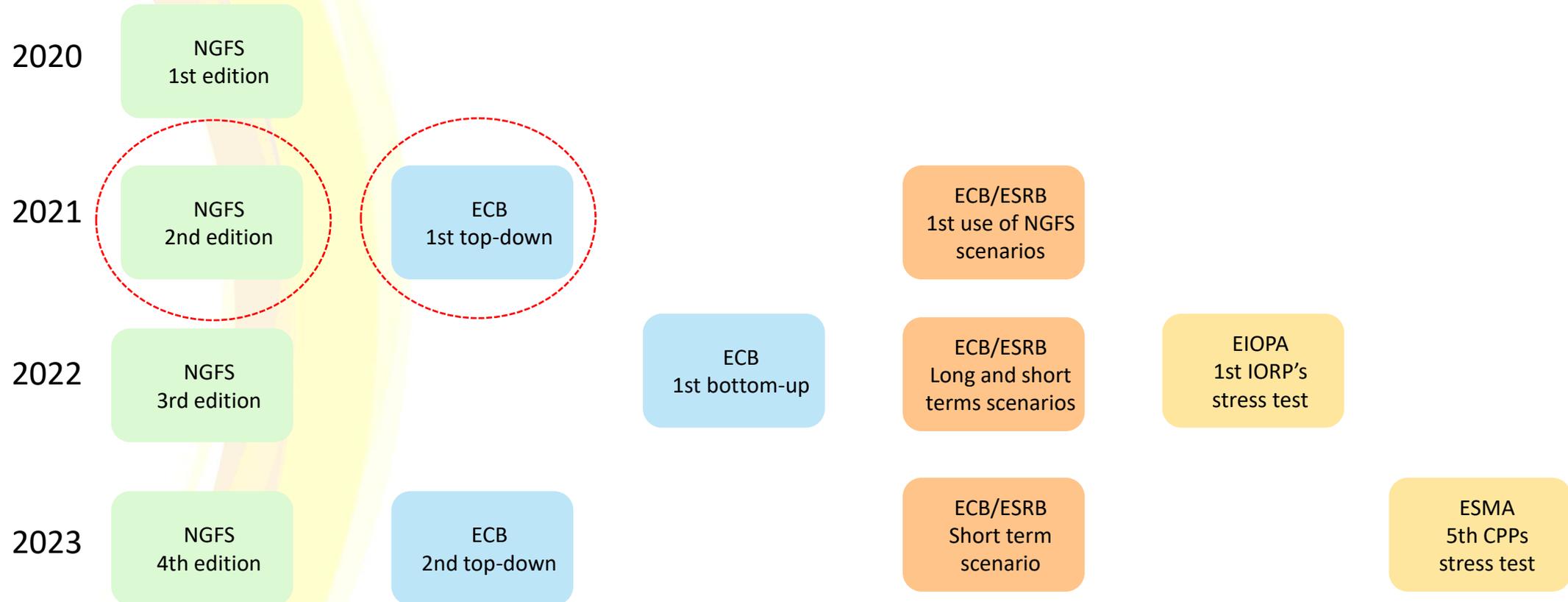
Annual report on the banking sector’s exposure to climate risk, (2023), Banco de Portugal.

Mesuring climate-related risks

- Exposure metrics; Risk metrics
- Climate scenario analysis

2. ASSESSING CLIMATE RISKS: SURVEILLANCE FRAMEWORK

Climate scenario analysis

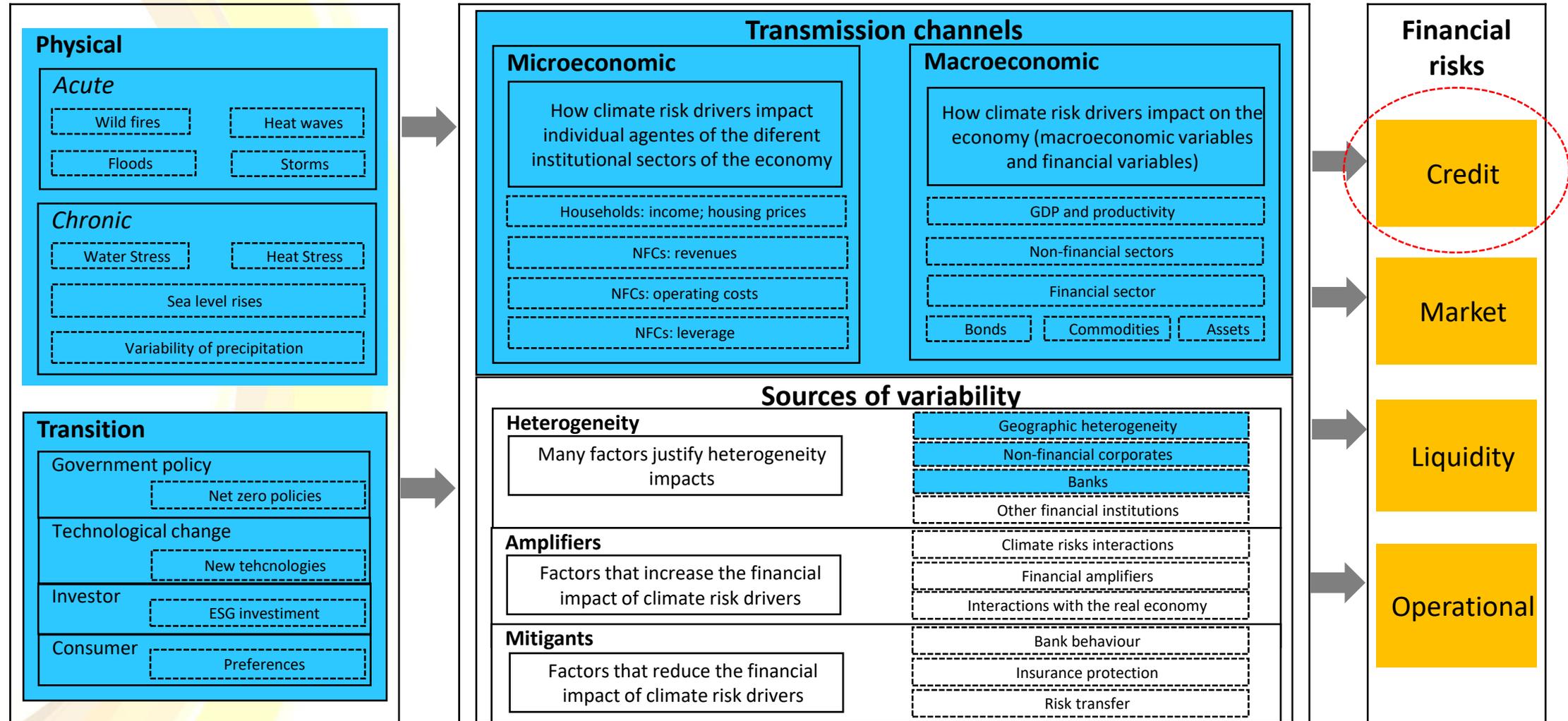


Source: adapted from “Towards macroprudential for managing climate risk surveillance framework”, ECB/ESPB, December 2023.

2. ASSESSING CLIMATE RISKS: SURVEILLANCE FRAMEWORK

Climate transition scenarios...

Climate related financial risks drives



Source: adapted from "Climate-related risk drivers and their transmission channels", April 2021, BCBS.

Climate scenario analysis

*“The results show that there are **clear benefits to acting early**: the short-term costs of the transition pale in comparison to the costs of unfettered climate change in the medium to long term. (...) The results also show that, although the effects of climate risk would increase moderately, on average, until 2050 if climate change is not mitigated, they would be concentrated in certain geographic areas and sectors. (...) **Climate change thus represents a major source of systemic risk, particularly for banks with portfolios concentrated in certain economic sectors and specific geographic areas**”.*

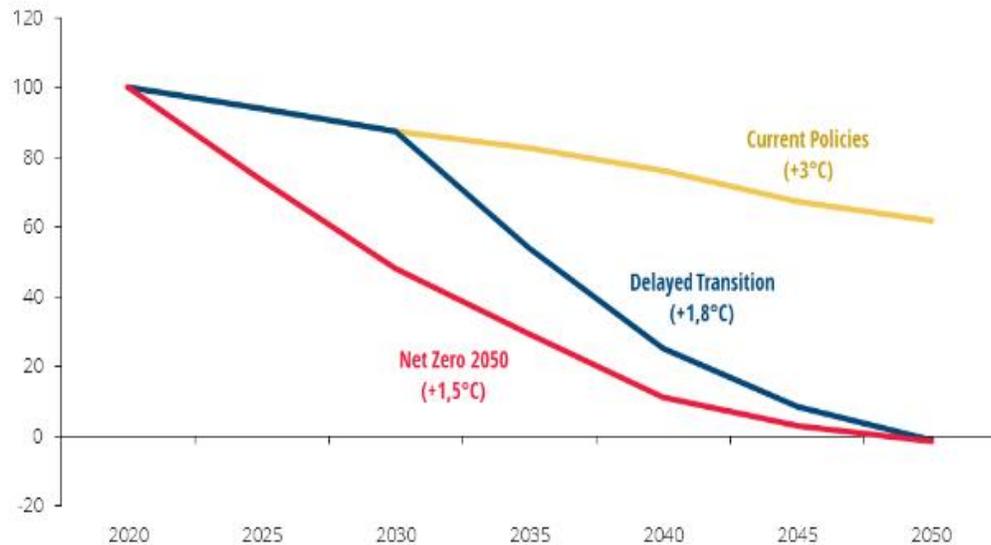
ECB economy-wide climate stress, Methodology and results, (2021), Occasional Paper Series, No 281, September 2021.

*“The results of the scenario analysis suggest that, **from the perspective of the banking system, there are benefits of acting swiftly to reduce emissions**. Despite the up-front transition costs, there are **gains over a projection horizon up to 2050 in the Net-zero 2050 scenario** – compared with the Delayed Transition and Current Policies scenarios – **in terms of probability of default, losses given default and, as a result, expected losses**. In turn, the Current Policies scenario shows, also at the horizon of 2050, higher costs than the Delayed Transition scenario in these three variables. **These results are broadly consistent with those obtained by the ECB for the euro area.**”*

2. ASSESSING CLIMATE RISKS: SURVEILLANCE FRAMEWORK

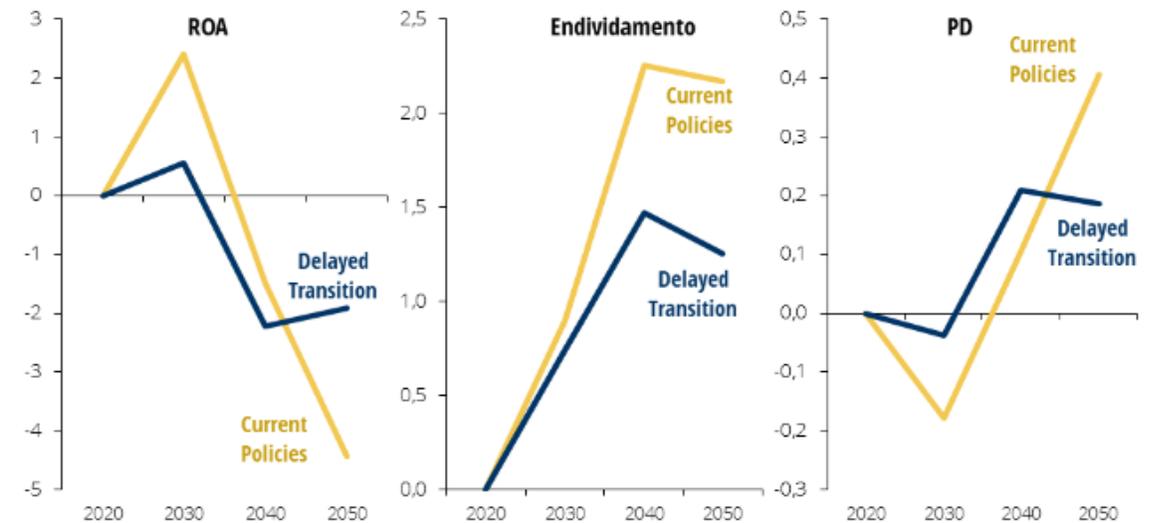
Climate scenario analysis

Chart 2.20 • Greenhouse gas emissions, projections for the European Union
| Index (2020=100)



Sources: Banco de Portugal and NGFS calculations. | Notes: Phase II scenarios, NGFS (2021b). The estimated global mean temperature increase at the end of the century from pre-industrial levels is in brackets. The European Union still includes the United Kingdom.

Chart 2.22 • Median ROA, indebtedness ratio, and PD differences against Net Zero 2050
| Percentage points



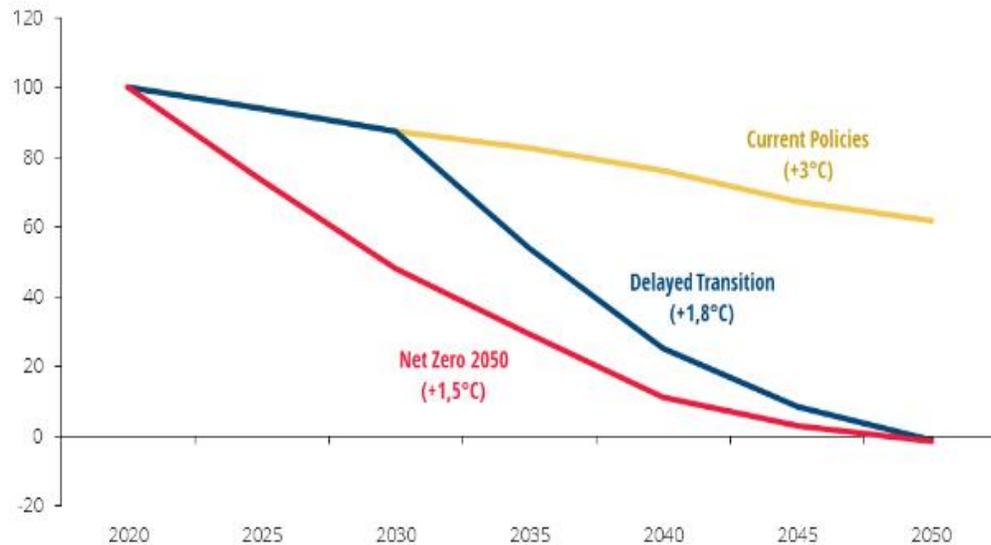
Source: Banco de Portugal. | Note: Differences in estimated PDs for the 50,000 firms considered in the projection exercise in the years specified.

Source: Annual report on the banking sector's & climate risks, Banco de Portugal, 2023

2. ASSESSING CLIMATE RISKS: SURVEILLANCE FRAMEWORK

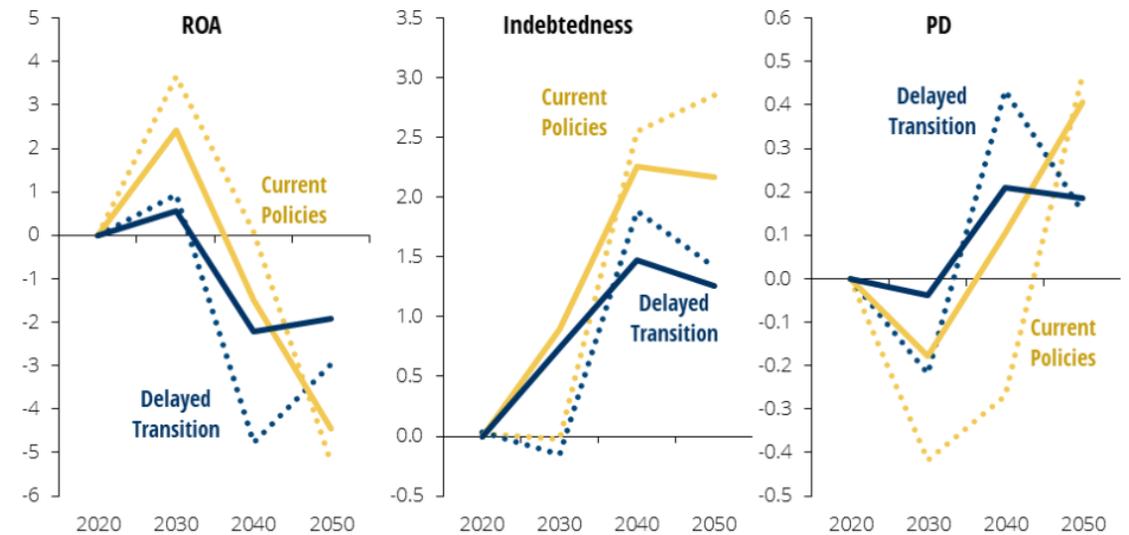
Climate scenario analysis

Chart 2.20 • Greenhouse gas emissions, projections for the European Union
| Index (2020=100)



Sources: Banco de Portugal and NGFS calculations. | Notes: Phase II scenarios, NGFS (2021b). The estimated global mean temperature increase at the end of the century from pre-industrial levels is in brackets. The European Union still includes the United Kingdom.

Chart 2.23 • Median ROA, indebtedness ratio, and PD differences against Net Zero 2050
for the top 10% carbon-intensive firms | Percentage points



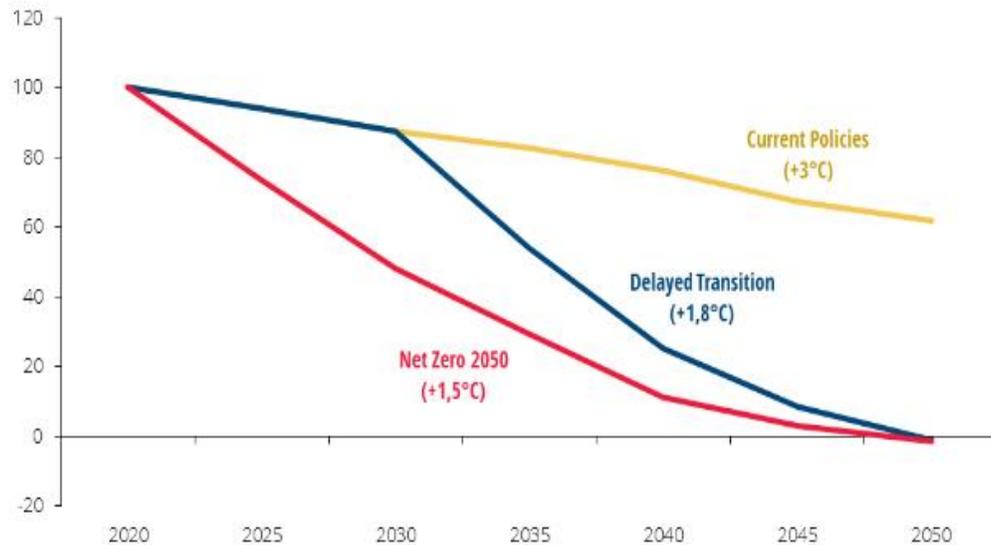
Source: Banco de Portugal. | Notes: Differences in estimated PDs for the 50,000 firms selected for the projection exercise. Carbon intensity corresponds to the ratio of total GHG emissions to revenues. Solid lines correspond to the medians of the total sample of firms and dotted lines correspond to the medians of the sample of top 10% carbon-intensive firms.

Source: Annual report on the banking sector's & climate risks, Banco de Portugal, 2023

2. ASSESSING CLIMATE RISKS: SURVEILLANCE FRAMEWORK

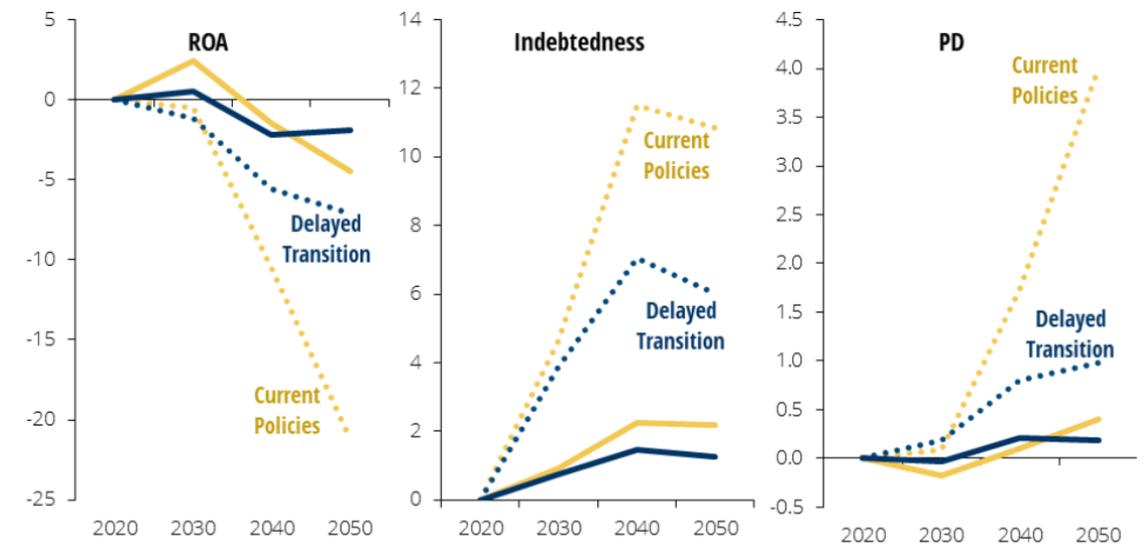
Climate scenario analysis

Chart 2.20 • Greenhouse gas emissions, projections for the European Union
| Index (2020=100)



Sources: Banco de Portugal and NGFS calculations. | Notes: Phase II scenarios, NGFS (2021b). The estimated global mean temperature increase at the end of the century from pre-industrial levels is in brackets. The European Union still includes the United Kingdom.

Chart 2.24 • Median ROA, indebtedness ratio, and PD differences against Net Zero 2050, in top 10% of physical risk impacts | Percentage points



Source: Banco de Portugal. | Notes: Differences in estimated PDs for the 50,000 firms selected for the projection exercise. Solid lines correspond to the medians of the total sample of firms and dotted lines correspond to the medians of the sample firms in top 10% of physical risk impacts.

Source: Annual report on the banking sector's & climate risks, Banco de Portugal, 2023

Mesuring climate-related risks

- Exposure metrics; Risk metrics
- Climate scenario analysis

Mitigating climate-related risks

Mesuring climate-related risks

- Exposure metrics; Risk metrics
- Climate scenario analysis

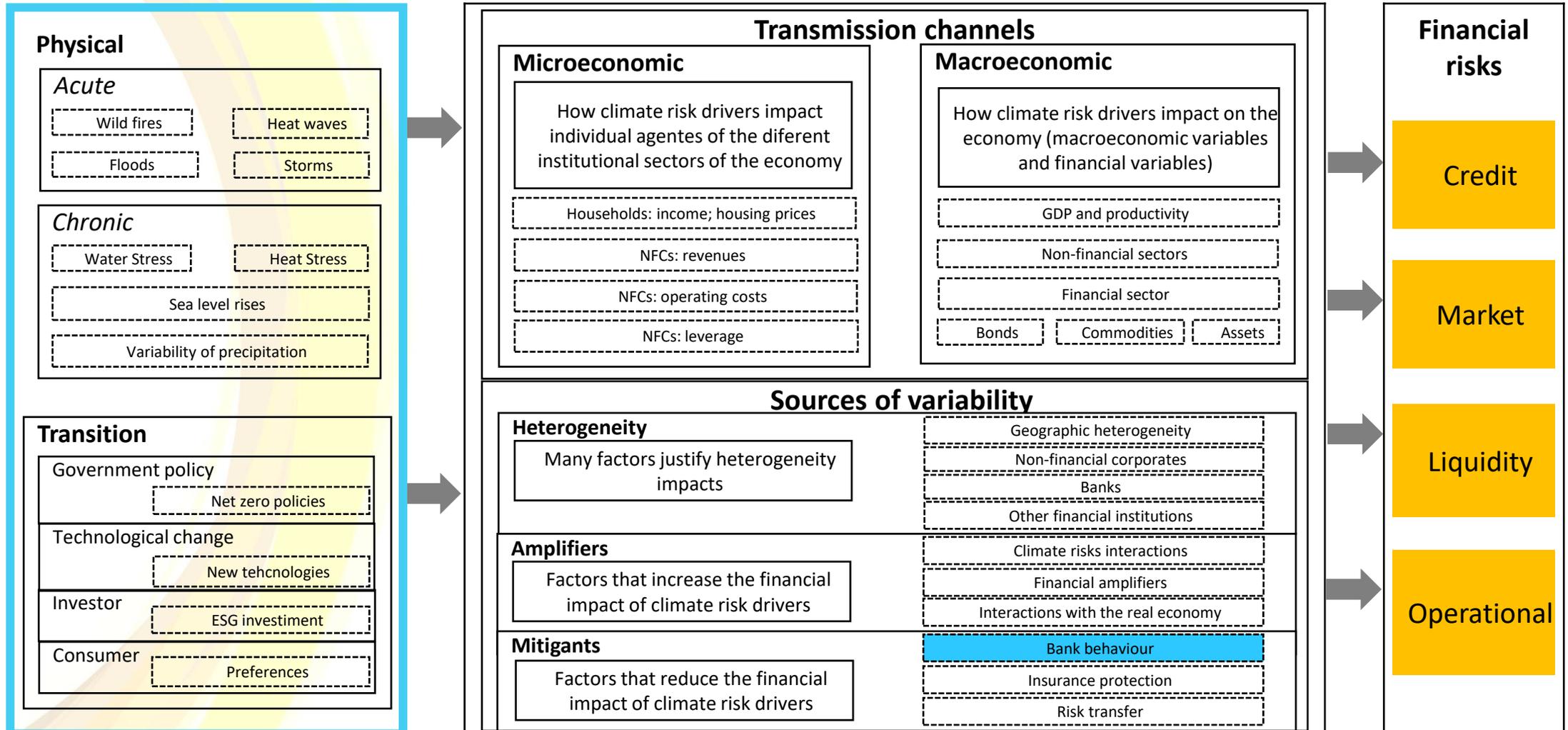
Mitigating climate-related risks

- Supervisory expectations

2. ASSESSING CLIMATE RISKS: SURVEILLANCE FRAMEWORK

Supervisory expectations...

Climate related financial risks drives



Source: adapted from "Climate-related risk drivers and their transmission channels", April 2021, BCBS.

Mesuring climate-related risks

- Exposure metrics; Risk metrics
- Climate scenario analysis

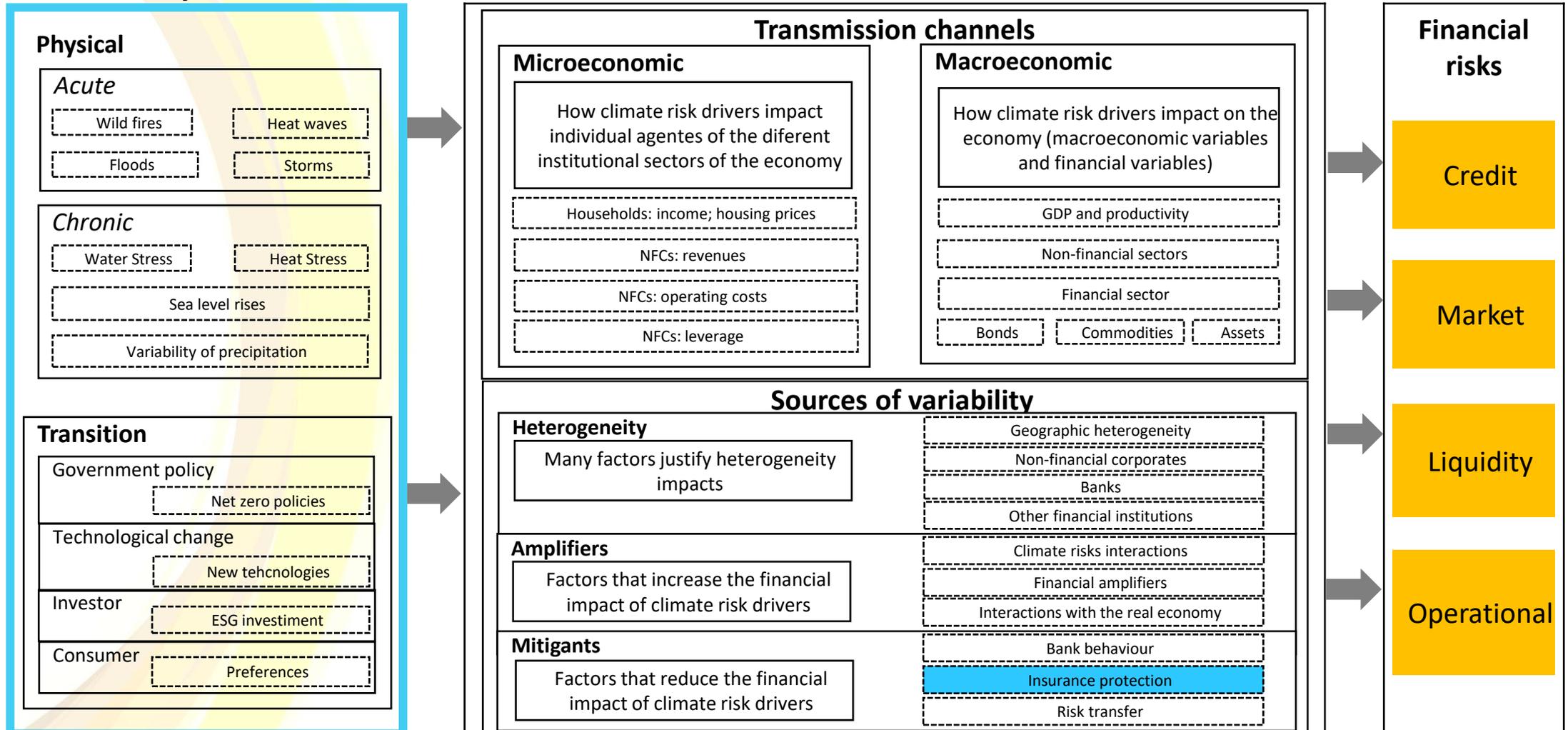
Mitigating climate-related risks

- Supervisory expectations
- Climate insurance protection

2. ASSESSING CLIMATE RISKS: SURVEILLANCE FRAMEWORK

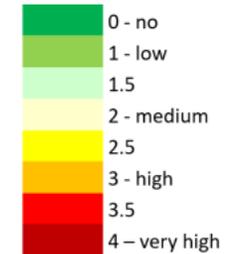
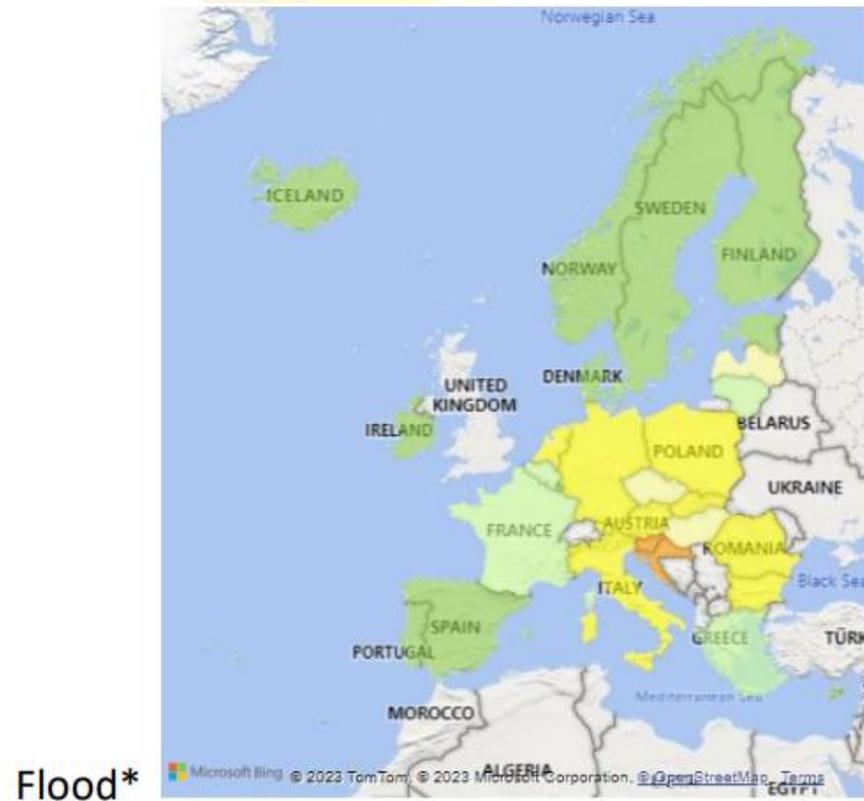
Insurance protection

Climate related financial risks drives



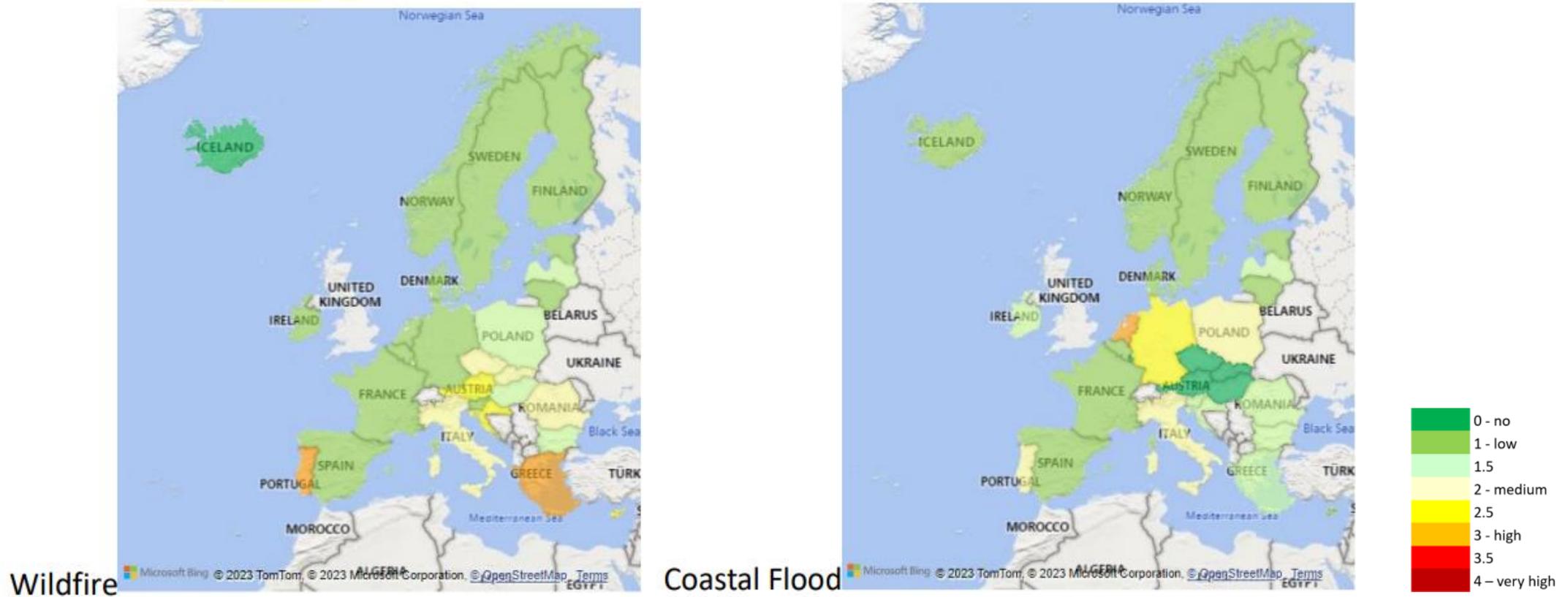
Source: adapted from "Climate-related risk drivers and their transmission channels", April 2021, BCBS.

2. ASSESSING CLIMATE RISKS: SURVEILLANCE FRAMEWORK



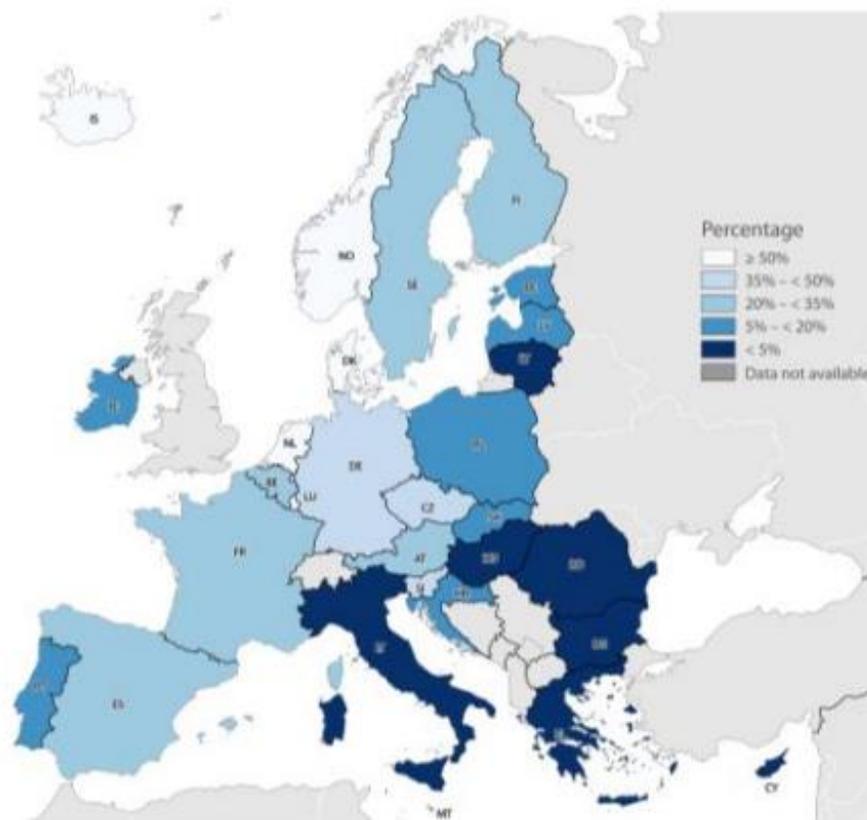
Source: Dashboard on insurance protection gap for natural catastrophes, EIOPA, 30 November 2023

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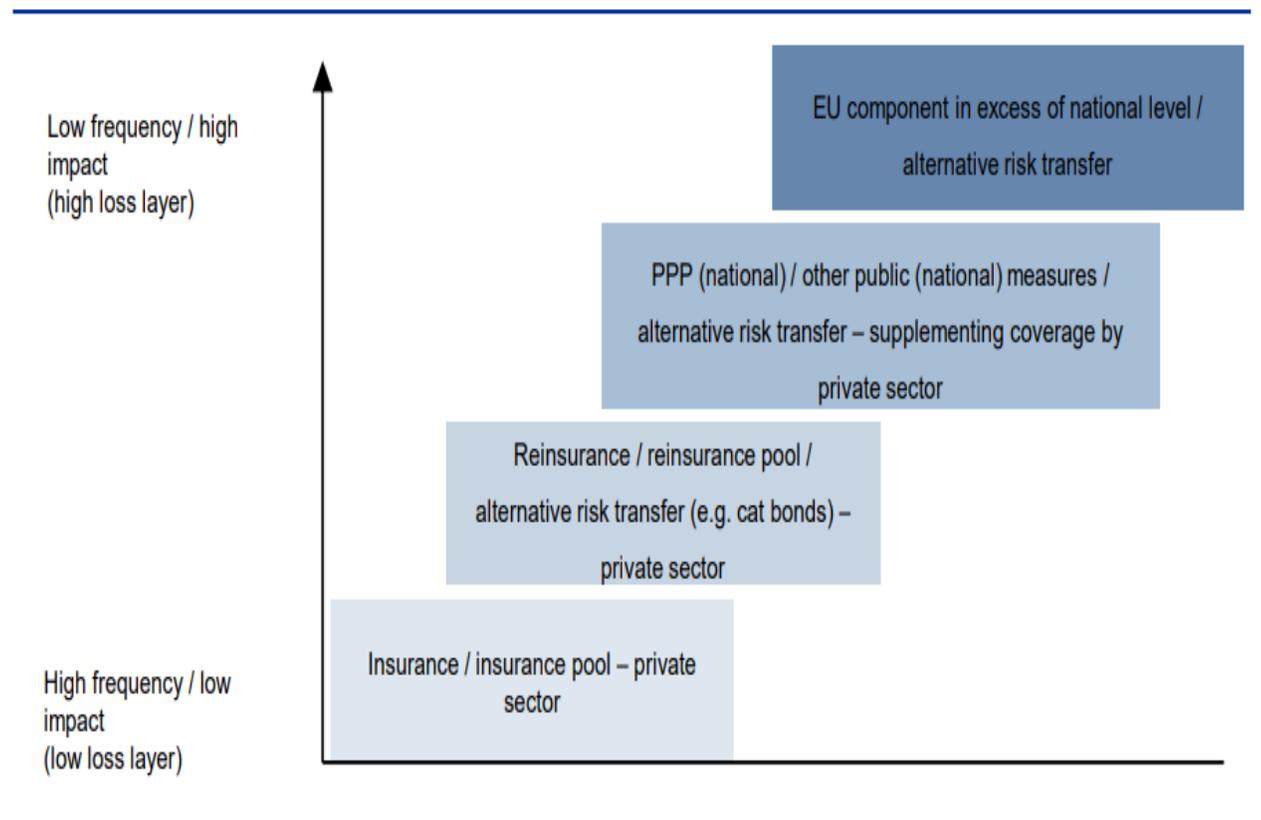


Source: Dashboard on insurance protection gap for natural catastrophes, EIOPA, 30 November 2023

2. ASSESSING CLIMATE RISKS: SURVEILLANCE FRAMEWORK



Source: EIOPA dashboard on insurance protection gap for natural catastrophes, European Environment Agency (EEA).



Source: “Policy options to reduce the climate insurance protection gap”, ECB/EIOPA, Discussion Paper, April 2023.

Mesuring climate-related risks

- Exposure metrics; Risk metrics
- **Exercises assessing the effects of selected risk channels**
- Climate scenario analysis

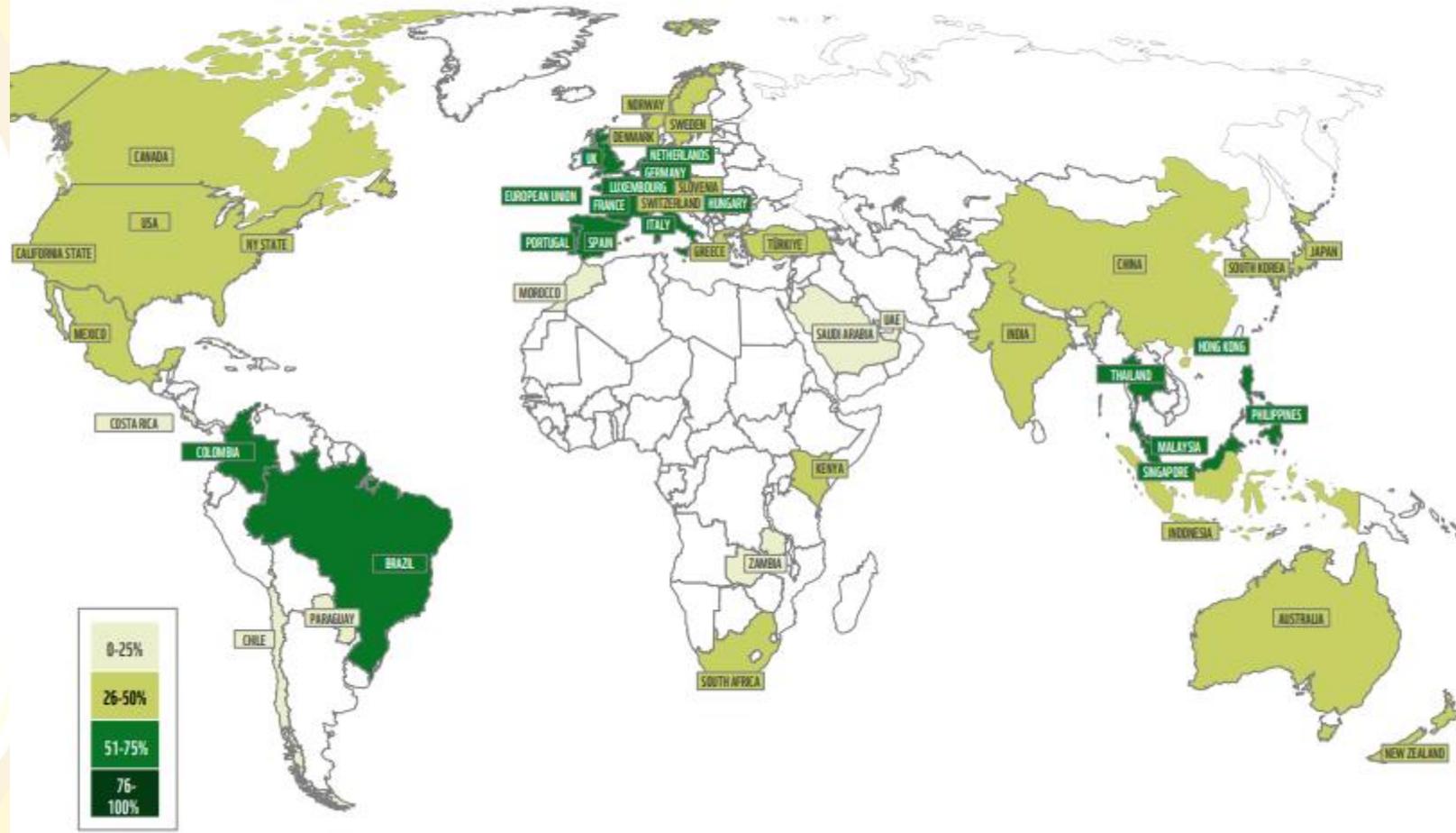
Mitigating climate-related risks

- Supervisory expectations
- Climate insurance protection
- **The role of financial markets**

Examples: Section 2.1.4, Annual report on the banking sector's exposure to climate risk, (2023), Banco de Portugal; "The economic and financial implications of climate change" speech by the Governor of Banco de España, 16 February 2024

2. ASSESSING CLIMATE RISKS: SURVEILLANCE FRAMEWORK

FIGURE 2: INTEGRATION OF CLIMATE-RELATED RISKS INTO BANKING SUPERVISION



Source: 2023 SUSREG Annual Report, Sustainable Financial Regulations and Central Bank Activities (SUSREG)

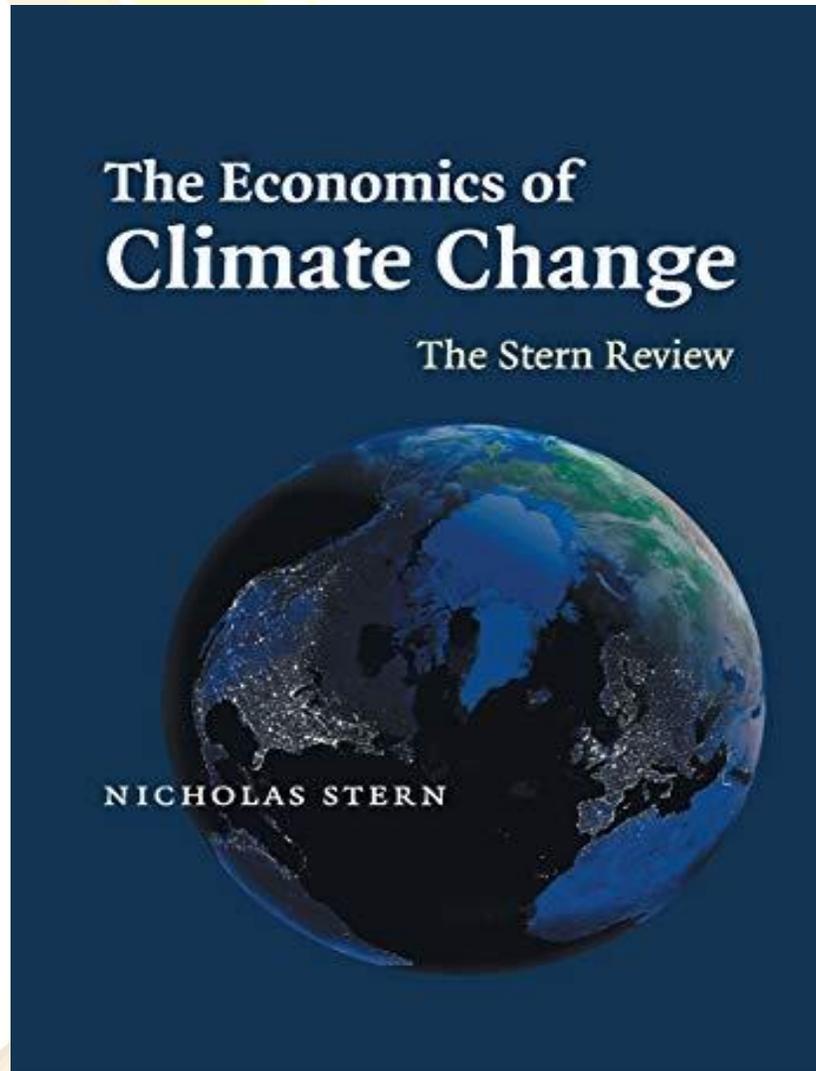
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1 Addressing climate risks: key milestones

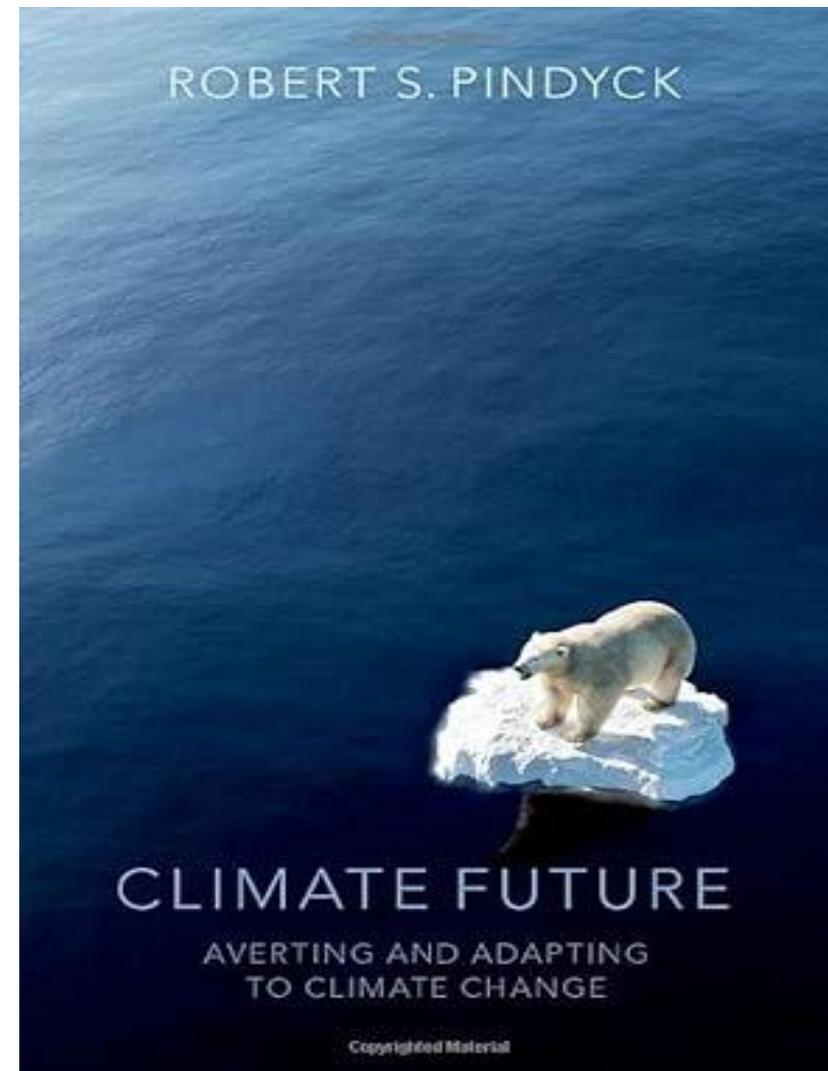
2 Assessing climate risks: surveillance framework

3 Challenges ahead

1. Improve climate-related data
2. Enhance the modelling framework
3. Focus on the implications of a faster transition
4. Incorporate interlinkages within the financial sector
5. Incorporate nature-related risks in scenario analysis
6. Monitor the pricing of climate-exposed insurance products
7. Address protection gaps
8. Monitor litigation developments
9. Enhance climate-related disclosures
10. Assess the regulatory and supervisory framework



Source: Nicholas Stern, *The Economics of Climate Change*, Cambridge University Press, 2007.



Source: Robert S. Pindyck, *Climate Future – Averting and Adapting to Climate Change*, Oxford University Press, 2022.



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