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ESG

BIS – Climate-related Risks – Measurement Methodologies and their Transmission Channels

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At a Glance

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Introduction

Physical and Transition Risks Overview

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Top-down and Bottom-up Approaches

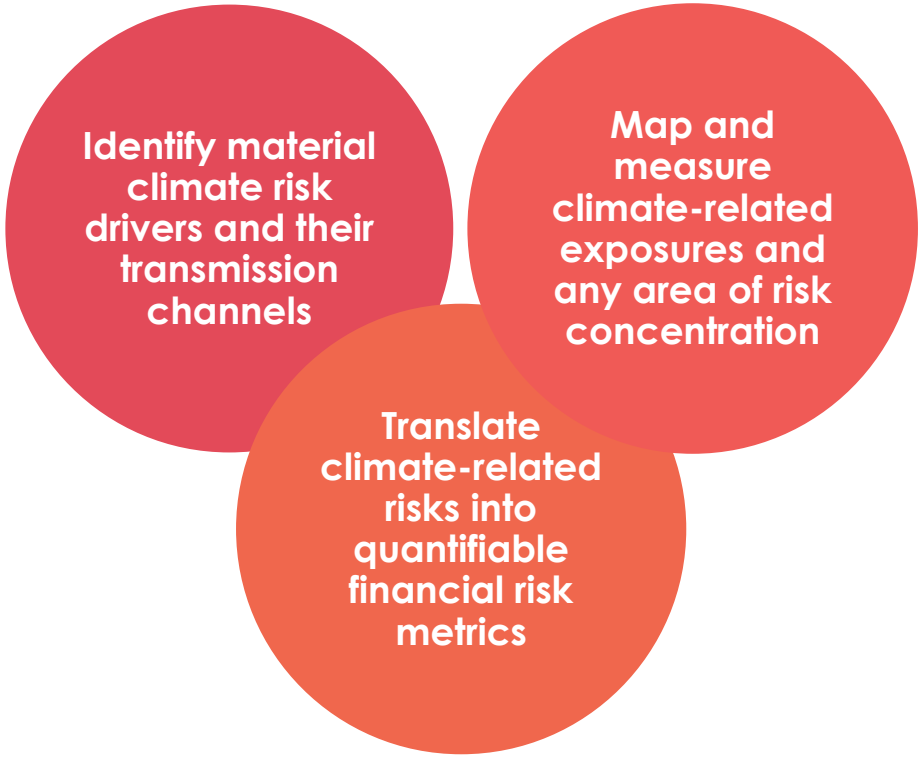
Risk Mitigation

Sources of Uncertainty

Data Needs

Introduction 1/7

The combined economic and financial impacts associated with climate change may give rise to **considerable future losses** for banking institutions.
Against this background, an **effective risk management** framework for banks and supervisors should have **three goals**:



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Physical and Transition Risks Overview

Physical

- Acute
- Chronic

Transition

- Government
- Policy
- Technological Change
- Sentiment (investor, consumer)

Transmission Channels

- **Microeconomic**
  how climate risk drivers impact households, corporates (including banks) and sovereigns as well as issuer-specific financial assets
- **Macroeconomic**
  how climate risk drivers impact on an economy overall and sovereigns in general as well as macroeconomic variables

Financial Risks

- Credit
- Market
- Liquidity
- Operational
- …

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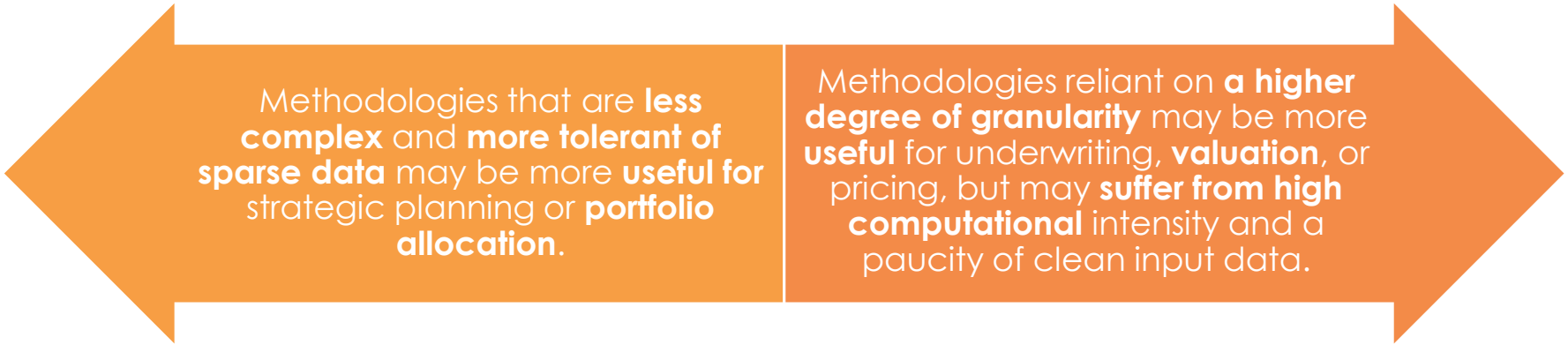
Exposures' Granularity and Heterogeneities

In estimating climate risk implications for transactions, banks and supervisors will need to determine their most relevant **level of exposure granularity**.



Heterogeneities play a key role in selecting measurement approaches, as each bank faces **idiosyncratic climate-related financial risks** within its portfolio, according to the geographies, markets, sectors, political environment and technological frontiers to which its counterparties are exposed.

- Jurisdictional
- Sectorial
- Geographical

Introduction 4/7

Top-down and Bottom-up Approaches

Bottom-up approaches dimension risk at the **component level**, aggregating these individual measures of risk up to provide a consolidated view of risk

However, aggregating individual risk exposures to a consolidated view of risk may require **understanding potential correlations** among risk exposures.

Top-down approaches **start by dimensioning risk at the genera**l, level and then "push down" the aggregated measure of risk to component parts.
However, it may **overlook the contribution of individual risk** exposures in the presence of interactions among those parts.

Introduction 5/7

Risk Mitigation

Climate risk exposure that includes the benefits of offsetting strategies can be viewed as **net exposure**, while approaches that estimate climate risk impacts without incorporating offsetting strategies are viewed as showing **gross exposure**

Net Exposure

In addition to proactive measures:

- Climate-related financial risks can also be offset through **counterparty measures** to adapt to, or mitigate the effects of, climate change
- Counterparties can take measures to moderate disruptions to their own income sources arising from hazard events through **insurance coverage**

Gross Exposure

Calculating the gross exposure of an asset or portfolio is important for two main reasons:

- Inform about the **present magnitude** of climate-related risks and **how** they might **evolve**
- Mitigants may lapse, change or **become obsolete**, reducing their reliability to effectively offset risk

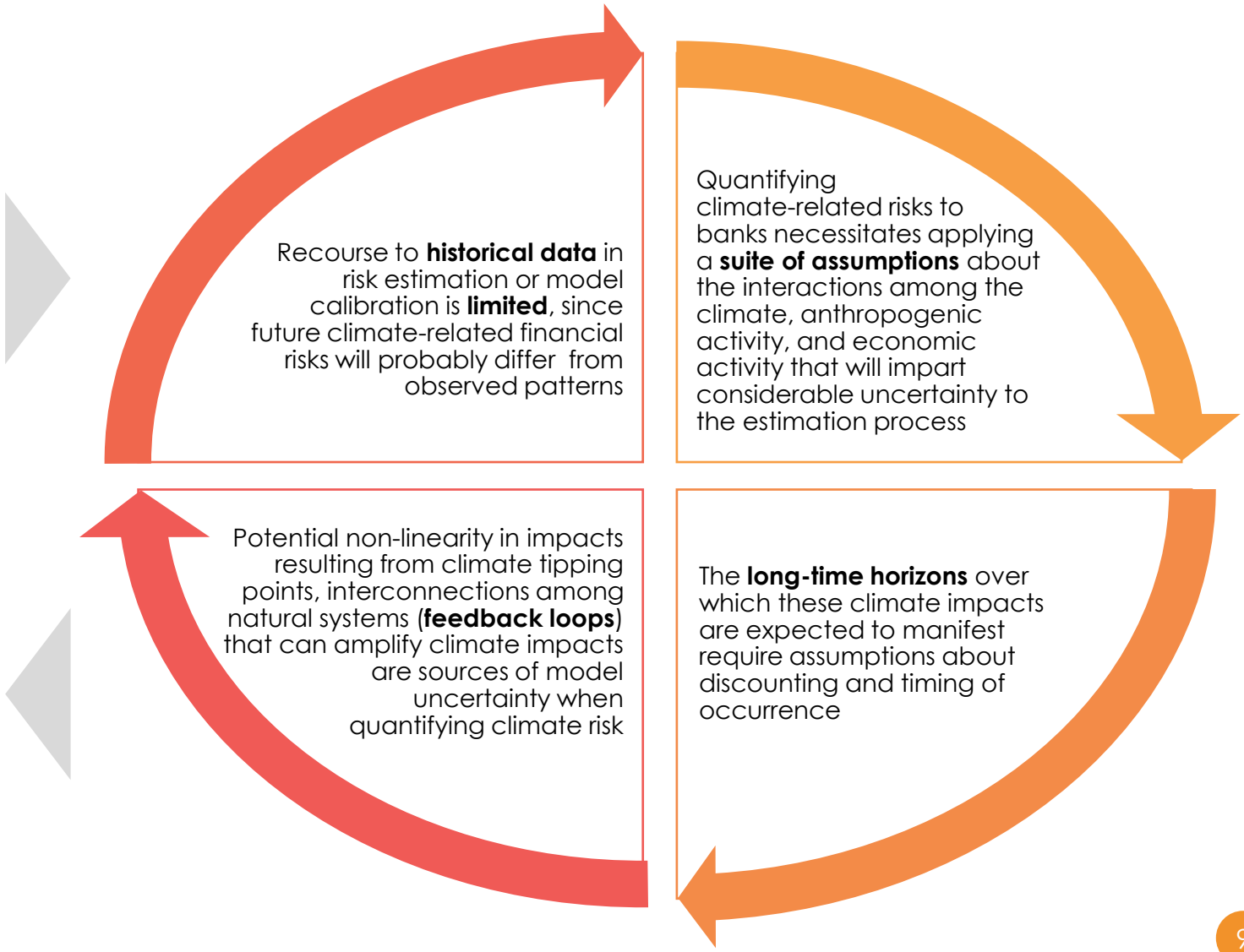
Measuring the effects of gross risk exposure and risk mitigants **separately** may be an important consideration to understand the full set of costs, benefits and efficacies associated with different courses of action

Introduction 6/7

Sources of Uncertainty

Measuring climate-related financial risks involves uncertainty that may lead to misestimation of risks

Methodological approaches to take these different drivers of uncertainty into account often involve evaluating **several scenarios** in a **forward-looking manner**.



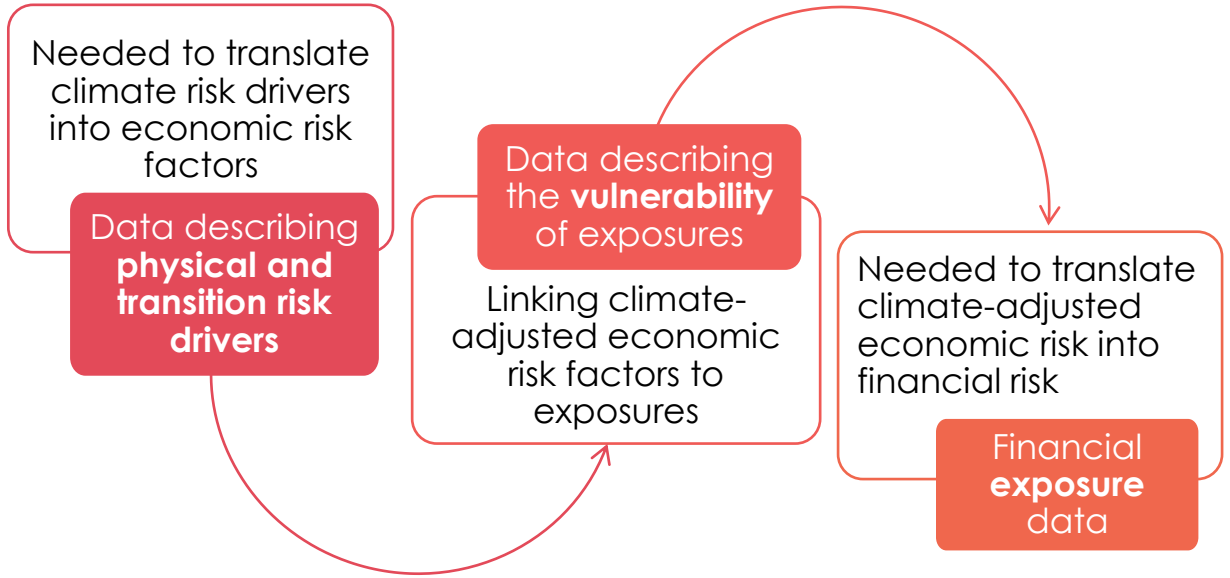
Introduction 7/7

Data Needs

Assessment of climate-related financial risks will require **new and unique** types of data:

- They may be **only partially available** and may not adequately meet traditional data quality standards
- The historical relationship between climate-related impacts and their financial consequences may not be representative of future climate-financial relationships.

Focusing on the types of data needed to assess climate-related financial risk, **three broad data categories** can be observed:



02

Microprudential Climate Risk Classification

Definition and Purpose

Features of a Climate Risk Classification

The Challenge of Risk Differentiation

Microprudential Climate Risk Classification 1/6

Definition and Purpose

Building a risk classification that can **rank order exposures** according to their relative vulnerability to climate-adjusted economic risk factors may be a key step in **exposure mapping**

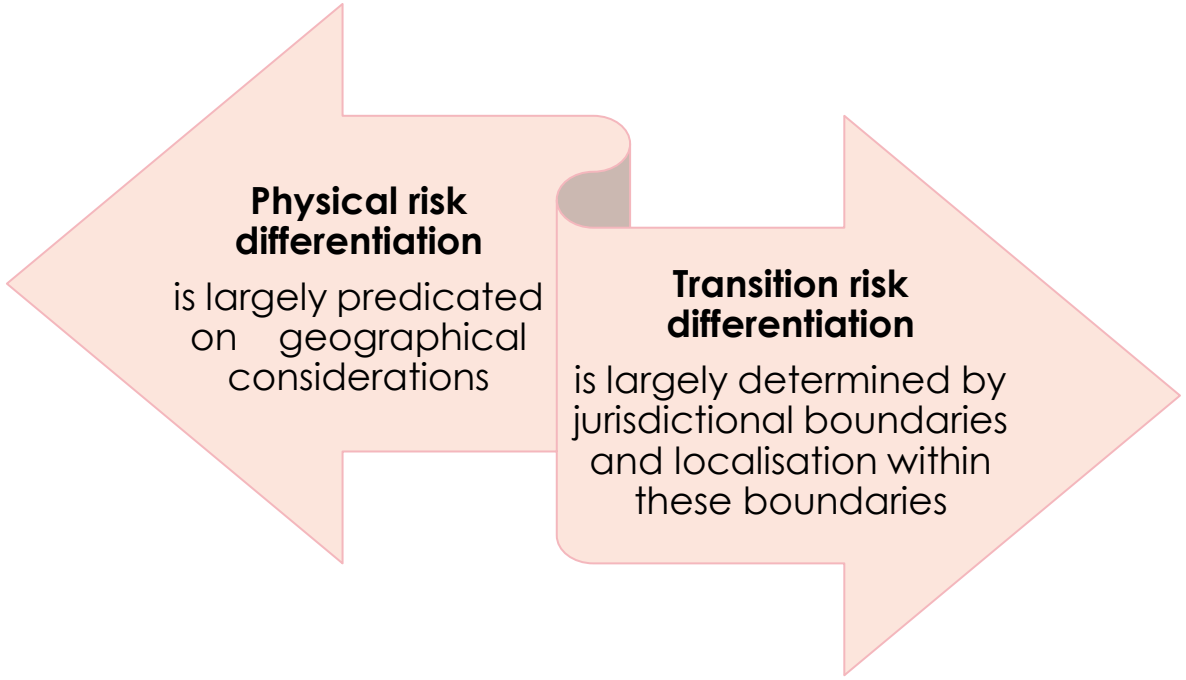
Existing risk classifications	Might be a logical starting point for determining the ability to differentiate climate risk among exposures	Do not incorporate climate-risk-specific heterogeneity	Less frequently updated
Climate risk classifications	Differentiate between exposures according to their relative vulnerability to climate risks, allowing to take heterogeneity into account	Allow for rank ordering, selection, pricing and management of exposures based on the financial risks that they bear as a result of climate-related risks	Incorporate dynamic features that respond to future changes in the distribution of climate impacts and evolutions in technological frontiers

Risk classifications are not sufficient on their own to map and monitor risk exposure or to estimate the financial impact stemming from climate risks. They can help rank order exposures according to relative risk vulnerability criteria, but do not determine how to grade those exposures along judgmental criteria for risk

Microprudential Climate Risk Classification 2/6

Features of a Climate Risk Classification

Geographical Location



Granularity in the breakdown of activities – classification by economic sector

- Some jurisdictions collect and publish data on GHG emissions by sector
- Sectoral classification is a good base for identification of the sectors that are the most exposed to impact of physical climate hazards at a regional or local level

- All entities within a sector might be categorised according to the transition risk ascribed to the sector
- In reality entities will have different efficiencies or different within-sector activities to others

Microprudential Climate Risk Classification 3/6

The Challenge of Risk Differentiation 1/4

Limitations of Observed Risk Classification Approaches

Existing classifications:	
	Simplicity of usage
	Lack of granularity
	Lack of individual counterparty's sensitivity to climate change risks

Climate-change-risk- related rating/score:	
	Increased granularity
	Higher specification
	Lower data availability and quality
	Lack of a clearly established empirical link between climate-related information and financial risk parameters

Microprudential Climate Risk Classification 4/6

The Challenge of Risk Differentiation 2/4

Risk Differentiation and Comparability Across Banks and Jurisdictions

In order to achieve a balance between the desired level of risk differentiation, with the useful level of granularity and complexity, and the need to compare and aggregate banks' exposures, common standards should be developed

Issues

Comparability across jurisdictions – development of cross-jurisdictional standards
Aggregation perspectives – conflict of integrating climate risk assessments between local conditions and group-wide policies (risk-taking and risk pricing); exacerbation of existing deficiencies in risk data aggregation and reporting due to IT requirements associated with large climate databases and the potential diffuse manifestation of climate risks across banking groups or jurisdictions.

Microprudential Climate Risk Classification 5/6

The Challenge of Risk Differentiation 3/4

Data Describing Physical and Transition Risk Drivers

Lack of sufficient granularity	Granularity - some climate indicators may not be available for some regions
Incompleteness	Not all the data can be found/accessed
Not updated	Can be not updated in a manner consistent with standard financial risk measurement frequencies
Data drawbacks	May present some drawbacks that affect the reliability of the analysis
Quality heterogeneity	Quality and availability can differ across the jurisdictions

Microprudential Climate Risk Classification 6/6

The Challenge of Risk Differentiation 4/4

Third-party rating information	Counterparty-level information	Supervisory reporting data
• End users of ratings provided by data aggregators may have limited insight into the accuracy of underlying information disclosed by the rated entities or the data cleansing process employed by the aggregator. • Relatedly, as most scores are based on proprietary models, data users may face opacity in obtaining a full overview of the methodological approach taken by the data providers. • Comparability of indicators across vendors is limited - often challenging to reconcile approaches followed by different providers, thus limiting the integration of multiple, non-compatible indicators within a single risk measurement process • A data gap may concerning the underlying sample of companies, particularly when the scores or indicators are derived from samples of large (listed) corporates – problem reduces banks' portfolio coverage and affects the representativeness of the rated sample.	• The ability of the bank to acquire client non-public information via the lending relationship - the data gaps or quality issues on a bilateral basis • The ability of the bank to update data after the underwriting and onboarding processes may be limited - gaps in climate reporting for existing exposures • Comparability limitation arises from differences in accounting principles and/or reporting schemes across jurisdictions • Common standards for climate data for financial risk assessment are currently non-existent	• While existing data provided can be leveraged in combination with third-party providers current supervisory reporting may lack sufficient granularity to assess transition and physical risks, as suggested by the supervisory survey

03

Methodologies

Estimation of Climate-related Financial Risks

Broad Risk Measurement Approaches

Complexity of Climate-related Financial Risks

Methodologies 1/10

Estimation of Climate-related Financial Risks 1/2

Several models have been developed by banks, supervisors and academics to decline climate scenarios into economic variables:

IAMs Integrated assessment models	
Combine energy and climate modelling with economic growth modelling	Don't capture the economic impacts of extreme climate change events
Inform about estimates of the social cost of carbon	Might not provide realistic projections of total GDP losses due to climate change
Linkage between sectors and geography	Risk is significantly understated because a zero probability is given to events that never happened before

CGE Computable general equilibrium	
Can deal with complex behavioral interactions among sectors and agents, which are too complex to be solved analytically	Each of the many embedded decision rules and parameter values cannot be assessed, due to the high complexity level, resulting in a significant black box aspect

Methodologies 2/10

Estimation of Climate-related Financial Risks 2/2

DSGE
Dynamic stochastic general equilibrium

Introduce further complexity into macroeconomic modelling

Entail a significant computational burden though and can be difficult to solve

OLG
Overlapping generational models

- Analyze long-term macroeconomic evolution
- Focus on intergenerational distribution of consumption highlighting the role of the discount rates on the estimation of the social cost of carbon

These models entail a significant computational burden though and can be difficult to solve

ABMs
Agent based models

- Better reflection of the uncertainty and complexity
- Consideration of the interactions between individual actors and institutions
- Incorporates technological change
- More realistic damage functions
- Captures simultaneous changes of features in one climate-economy model

- High computational and data demands
- Opacity in the underlying mechanism

Methodologies 3/10

Broad Risk Measurement Approaches 1/4

Although theoretically **conventional measurements of risk could be adapted** to assess climate-related financial risk – as the analysis of climate-related impacts, at both micro and macro level, is not fundamentally different from standard scenario analyses or stress tests – there are some factors that make climate risk measurement complex and its outputs less reliable as risk estimators, hence other **more specific models are needed** for this purpose.

Risk measurements processes applied from banks and supervisors

Traditional Approaches

New Approaches

Methodologies 4/10

Broad Risk Measurement Approaches 2/4

Traditional Approaches

Climate risk scores or ratings

Rate the climate risk exposure of assets, companies, portfolios, or countries by combining a risk classification scheme with a set of criteria to assign a quality score to exposures according to their classification.

This methodology can be location-specific, and incorporate supply chain and company-specific information

In the absence of data, they exhibit more biases than other approaches

Scenario analysis

Forward-looking projections of risk outcomes, in four steps:

1. Identify physical and transitional risk scenarios
2. Link the impacts of scenarios to risks
3. Assess counterparty and/or sector sensitivities to those risks
4. Calculate an aggregate measure of exposure and potential losses

They tend to be longer-term in scope

Methodologies 5/10

Broad Risk Measurement Approaches 3/4

Traditional Approaches

Stress-testing

+	-
A specific subset of scenario analysis, typically used to evaluate a financial institution's near-term resiliency to economic shocks There are two types of stress testing, from a solvency perspective: 1. Macroprudential 2. Microprodential	The uncertainty inherent in longer-dated assessments and the limited predictive power of historical observations to describe future climate-economic relationships render estimates less reliable than those of conventional stress tests

Sensitivity analysis

+	-
A subset of scenario analysis that is used to evaluate the effect of a specific variable on economic outcomes. Consists in altering one parameter across multiple scenario runs to observe the range of scenario outputs that result from changes in that parameter.	-

Methodologies 6/10

Broad Risk Measurement Approaches 4/4

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New Approaches

Natural capital analysis

NCA analysis posits **nature as a capital stock** and accordingly assesses how natural degradation negatively impacts a financial institution. This analysis emphasizes and reinforces the idea that natural capital is limited – because natural resources are now recognized as being finite and their cost increases as they become scarcer, especially if and when climate change accelerates their scarcity.

Climate VaR

Climate value-at-risk (VaR) assessments apply the **traditional VaR framework** to gauge the impacts of climate change on financial institutions' balance sheets

Methodologies 7/10

Complexity of Climate-related Financial Risks 1/4

Scenario Design and Complexity of Climate-related

Uncertainty around the climate risk drivers

- Developing complex climate and financial scenarios, the degree of discretion underlying the assumption within any single scenario is significant and different methodological choices can give rise to different outcomes
- Exploring multiple scenarios resulting from various climate risk drivers may be particularly resource-intensive.

Capturing the specific impacts of climate scenarios

- The need to continue developing modelling frameworks to capture the impacts of climate scenarios, including stressed variants, within an integrated and tractable modelling framework.
- Existing models, being calibrated on historical data and statistical relationships, may not adequately capture climate scenario dynamics.
- For physical risk drivers existing models estimating economic impacts from climate change usually do not capture the full range of potential climate change impacts.
- Economic modelling frameworks can often only take into consideration the impacts of chronic physical. The economic impacts of extreme weather events or of potential future disruptive changes in climate are usually not captured.

Comprehensiveness of modelled impacts

- A comprehensive assessment would include modelling second-round effects such as the propagation of policy or physical risk shocks through supply chains or financial contagion while accounting for the adaptive and mitigation abilities of economic agents.
- At the macro level - evolution in insurance coverage or governments' natural catastrophe schemes, the vulnerability of households or companies to the financial consequences of more frequent and costly natural disasters.

Methodologies 8/10

Complexity of Climate-related Financial Risks 2/4

Translating Scenario Outputs to Financial Risks

1

Sufficient depth and variance in the historical observations of the risk drivers are needed to estimate robust relationships. Historical observations of risk materialisation linked to climate risks are missing or are not good predictor

2

Financial models cannot currently derive empirical risk parameters

3

A few banks and supervisors are attempting to attribute the impact of aggregate stressed scenario variables on the financial metrics of the counterparties based on relevant characteristics and then infer the impact on risk parameters

LIMITATIONS of aggregate stressed scenario approach

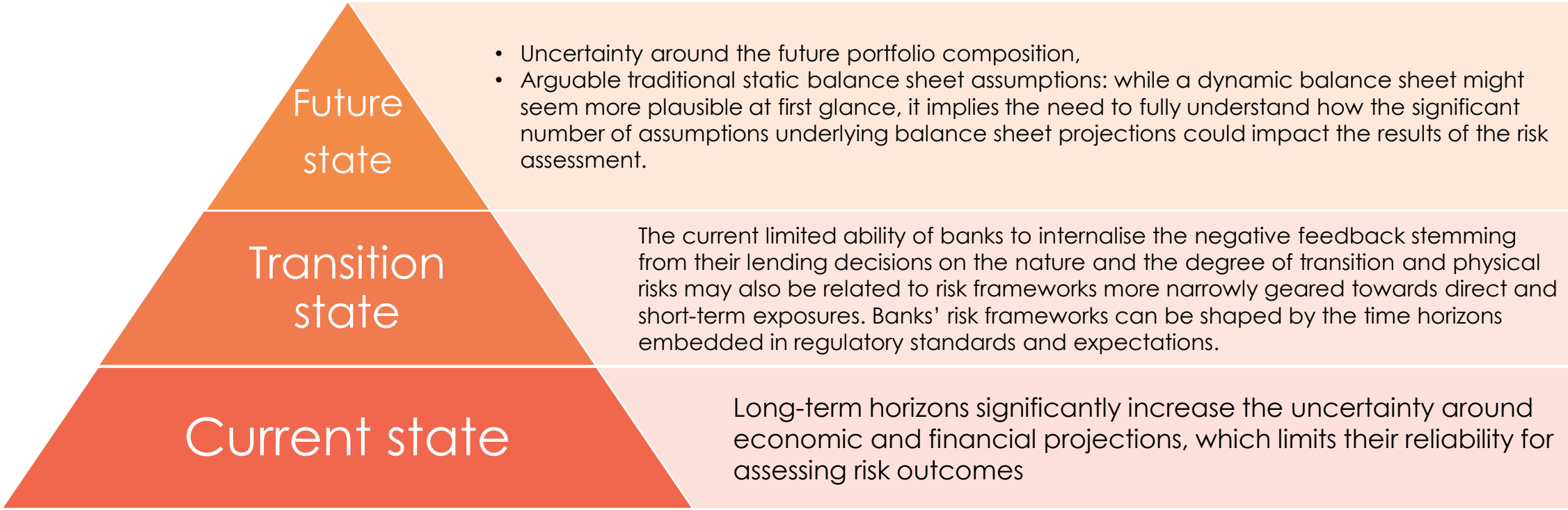
- It reverts to the ability of banks and supervisors to gather all the necessary data to classify counterparties along these characteristics.
- The results are based on a strong underlying simplified assumption about the relationship between scenario-related variables and the financial impact on the counterparty, which limits their usability for certain risk management purposes such as asset pricing or funds transfer pricing.

Methodologies 9/10

Complexity of Climate-related Financial Risks 3/4

Time Horizon Related Challenges

The long-term nature of climate change is leading banks and supervisors to consider horizons that can extend significantly beyond the one commonly considered by institutions – up to 2050 in observed practices



- Uncertainty around the future portfolio composition,
- Arguable traditional static balance sheet assumptions: while a dynamic balance sheet might seem more plausible at first glance, it implies the need to fully understand how the significant number of assumptions underlying balance sheet projections could impact the results of the risk assessment.

The current limited ability of banks to internalise the negative feedback stemming from their lending decisions on the nature and the degree of transition and physical risks may also be related to risk frameworks more narrowly geared towards direct and short-term exposures. Banks' risk frameworks can be shaped by the time horizons embedded in regulatory standards and expectations.

Long-term horizons significantly increase the uncertainty around economic and financial projections, which limits their reliability for assessing risk outcomes

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Complexity of Climate-related Financial Risks 4/4

Operational Complexity in the Measurement of Risk

IT DEVELOPMENTS	Banks' ability to assess their overall exposure to climate risks across all of their significant operations will be heavily dependent upon the quality of their IT systems and the ability to aggregate and manage large amounts of data
METHODOLOGY IMPLEMENTATION	Most methodologies are contingent on this ability to collect, format and process very large amounts of new climate-specific data.
HUMAN RESOURCES	Regarding human resources and expertise, the interdisciplinary nature of climate-related financial risk measurement may require both pooling resources from a wide range of relevant functional and business areas and developing in-house or outsourcing climate-specific expertise.
SIZE AND STRUCTURE	A higher degree of idiosyncrasy among business lines and banking entities may challenge internal harmonization towards common risk assessment approaches, risk metrics and methodologies, necessitating more sophisticated modelling techniques, while smaller, less complex banking groups may face trade-offs in resource allocation and sophistication.

04

Risk Quantification

Measurement of Climate-related Financial Risks

Exposure Mapping and Measurement

Scenario Analysis

Scenario Analysis Methodologies

Risk Quantification 1/9

Measurement of Climate-related Financial Risks

The methodologies used to quantify climate-related financial risk can be assessed on **two different levels**:

Bank level

Bank level scenario analysis and stress testing methods on climate-related financial risk is applied with the goal of understanding the potential impact on selected portfolios, to refine methodologies and assess limitations and benefit.

A crucial objective for banks is the translation of transition and physical risk drivers into financial risk and their incorporation into internal models

Supervisor's level

Supervisor level scenario analysis may be used for two purposes:

- **Microprudential** supervision
- **Macroprudential** policies

Quantify banks' **financial exposures** vulnerable to specific climate risk and assess the size and distribution of climate risks in the financial system

Risk Quantification 2/9

Exposure Mapping and Measurement 1/2

Banks' Methodologies

An initial component of risk assessment is identifying material risk transmission channels according to the exposure profile of a particular bank or banking group. Indicators or metrics used by banks to map, measure and monitor exposures are usually distinguished by **transition** and **physical** risks

Transition risk	Physical risk
• Analyze how and to what extent certain sectors could be affected by a transition to a low-carbon economy • Some banks measure the carbon-related assets they hold, which is used as an approximation to size transition risk. This approach aims at identifying potential "pockets of risk" • Banks also use indicators related to "greenness" of financial assets and real estate • Some banks assess the potential risk differential between "green" and "brown" activities	• Indicators or metrics to map, measure and monitor physical risk at portfolio level aim to identify geographical risk concentrations and the type of hazard as well as its probability and potential severity • Banks have also started to use geospatial mapping to assess and monitor the extent to which their exposures may be affected by physical risks.

Risk Quantification 3/9

Exposure Mapping and Measurement 2/2

Supervisors' Methodologies

Transition risk	Physical risk
• Supervisors' assessments are based on either regulatory information or ad hoc surveys • For corporate portfolios and real estate exposures, supervisors often use indicators describing the emission intensity, carbon footprint or sensitivity to climate policies of banks' • Sectoral analyses are usually focused on sectors deemed most sensitive to transition risk based on sectoral carbon intensity. Exposures to these sectors based on existing supervisory reporting can then be aggregated • For real estate exposures, transition risk analyses can be combined to measure an average weighted energy label associated with each bank's portfolio	• To assess the banking system's exposure to physical risk drivers, supervisors identify hazards that are most relevant in their jurisdictions and, within these, the specific regions that are more vulnerable to these hazards • Used indices may describe single hazards and/or the vulnerability of certain locations to these hazards, multi-hazard or aggregate risk scores, and heat-maps • Once salient physical risk drivers are identified, authorities may assess the risk exposure of individual supervised entities or of the banking system to geographies with stronger susceptibility to physical risk • When granular credit data is available, exposures to physical risk can be measured at the counterparty, activity or sectoral level in addition to the country level

Risk Quantification 4/9

Scenario Analysis

Stress Testing and Sensitivity Analysis

Climate scenario analysis is a forward-looking projection of risk outcomes that is typically conducted in **four steps**:

1. Identify physical and transition risk scenarios
2. Link the impacts of scenarios to financial risks
3. Assess counterparty and/or sector sensitivities to those risks
4. Extrapolate the impacts of those sensitivities to calculate an aggregate measure of exposure and potential losses

We can consider **two subsets of scenario** analysis, that can be used to assess the climate-related financial risk:

1. **Stress Testing**
2. **Sensitivity Analysis**

Risk Quantification 5/9

Scenario Analysis

Just in Time

Stress Testing and Sensitivity Analysis

Stress Testing

Stress testing is used by some banks and supervisors to assess climate-related risks evaluating the effects of severe but plausible climate scenarios on the resiliency of financial institutions or systems.

Sensitivity Analysis

Sensitivity Analysis is used to evaluate the effect of a specific variable on economic outcomes. One parameter is altered across multiple scenario runs to observe the range of scenario outputs that result from changes in that parameter. Sensitivity analysis has often been used in transition risk evaluation to assess potential effects of a specific climate-related policy on economic outcomes.

Climate risk **scenario analyses**, including **stress testing** and **sensitivity analysis**, are comprehensive assessments of the impact of macroeconomic and financial variables derived from climate-economy models. Because these scenarios are based on projections of possible future states of the world, they incorporate forward-looking information that can complement **historical data**. They aim at quantifying the potential financial impacts that banks or the financial system may face by comparing a baseline scenario against scenarios that reflect varying degrees of risk arising from climate change.

Risk Quantification 6/9

Scenario Analysis Methodologies 1/4

Banks-level Methodologies

Banks' Transition Risk

Banks' transition risk scenario analysis tends to focus on impacts to credit parameters for counterparties belonging to specific sectors. This includes corporate exposures in sectors relevant to climate policies. One specific example is the use of a shadow price and its inclusion in a transition risk sensitivity exercise or as part of a scenario analysis: adjustments to basic prices (e.g., electricity, carbon, fuel price) are used to evaluate how counterparties could be affected. This approach aims at anticipating potential market or policy changes such as the introduction of carbon pricing or a tightening of existing climate regulations, in order to estimate the impact of such changes on the financial profile of a counterparty and assess the bank's adjusted credit risk. It entails defining one or a range of potential future prices, based on external scenarios or in-house expertise. These "shadow prices" can then be used to assess the impact on financial variables (for example cash flows, or EBITDA) and in turn the credit risk profile of a counterparty. Although mostly used by institutions at a more advanced stage of climate risk analysis, several other banks already signal that they intend to use such methods in their planning or decision-making (ACPR (2019); IIF/EBF (2020)).

Banks' Physical Risk

Banks' physical risk analysis tends to focus on corporate and household (particularly mortgage) exposures. They then infer from this a potential impact on the credit quality of counterparties. Corporates in specific sectors (such as electric utilities) can also be subject to assumptions regarding business interruption and hence their financial performance and the level of credit risk that they may exhibit. An observed practice is to focus on sectors more sensitive to long-term change in weather patterns (e.g., temperature or precipitation). In this case, chronic physical risks are translated into productivity changes, and subsequently into changes in firms' revenues. As for acute physical risks, an observed practice is to assess potential impacts of extreme weather on the value of the bank's real estate collateral and more generally on its real estate exposures (through the impact on housing prices).

Risk Quantification 7/9

Scenario Analysis Methodologies 2/4

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Supervisors-level Methodologies

Supervisors may use scenario analysis and climate stress tests for microprudential supervision, and to inform macroprudential policies:

Macroprudential level

Scenario analysis and stress testing may be used to assess the size and distribution of climate risks in the financial system, and whether these risks may be systemic in nature. In terms of the financial risk types being assessed, most climate scenario analyses and stress tests focus primarily on **credit risks** and **market risks** arising from financial institutions' loan and investment portfolios (eg stranded assets, corporate defaults and sovereign bond revaluation).

Scenario analysis and stress testing may be used to:

1. Quantify **banks' financial exposures vulnerable** to specific climate risk drivers
2. Understand the **vulnerability of banks' business models** when confronted with specific climate scenarios, and the implications for their business strategy

Microprudential level

Risk Quantification 8/9

Scenario Analysis Methodologies 3/4

Supervisors-level Methodologies

While **traditional Supervisory Stress Testing** is used by supervisors to determine the resilience of banks' capital positions to financial losses, or inform the calibration of additional capital requirements, climate scenario analysis and stress testing, as currently used by supervisors, serves two main objectives:

1. As a tool to supplement supervisors' understanding of the impacts of climate change on their regulated banks' risk management and business strategy, rather than a test of banks' capital adequacy against potential losses

2. As part of their prudential policies, as a means to raise the awareness of the industry with respect to these risks and incentivize banks to develop appropriate risk models and governance and identify data gaps (Bank of England (2019); ACPR (2020))

Risk Quantification 9/9

Scenario Analysis Methodologies 4/4

Supervisors-level Methodologies

A variety of approaches are used to model the impact of climate-related risks, at the macro, sector level:

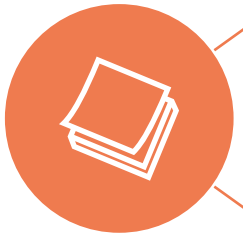
Macro Level	Sector Level
At the macro level, climate scenarios are translated into macroeconomic and financial market variables. Multi-country macro-econometric models such as NiGEM are used to generate such macroeconomic variables. The impact of these variables on point-in-time credit risk parameters, including PD and LGD, are then estimated.	A sector-level calibration may be introduced to differentiate the risk profile across sectors and enhance the granularity of the analysis. As example, Netherlands Bank (2018) a transition vulnerability factor for each industry included in a transition risk stress test, based on the amount of carbon emissions to produce the final goods and services of each industry. This allows the supervisor to translate macroeconomic conditions into industry-specific losses.

05

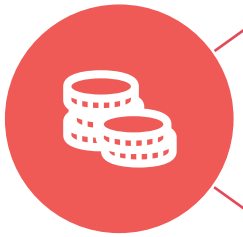
Conclusions

Conclusions

Frameworks for translating climate change scenarios into the broad array of financial risks to banks **remain relatively nascent**



Classifications embedded within risk metrics are often **difficult to compare**, as some are static and devoted to point-in-time exposure measurement, while others are rather dynamic and refer to strategies, such as alignment metrics.
Data needs include **more consistent information** on climate risk drivers; the vulnerability of counterparties, sectors and regions to these risk drivers and, consequently, their impact on the real economy; and ultimately their translation into financial risks for banks, and financial system impacts



On the side of methodologies, **further investments are needed in models** to enhance measurement of forward-looking climate-related risk.
In outlining measurement methodologies and the current state of knowledge on their quantification in climate-related risk frameworks, they have noted areas where mapping to traditional risk drivers for banks is possible, as well as those areas where it remains a challenge

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[02] **Bank for International Settlements.** *Climate-related risk drivers and their transmission channels*. Basel Committee on Banking Supervision, April 2021.

Company Profile

Iason is an international firm that consults Financial Institutions on Risk Management. Iason integrates deep industry knowledge with specialised expertise in Market, Liquidity, Funding, Credit and Counterparty Risk, in Organisational Set-Up and in Strategic Planning.

Ekaterina Mironenkova
Quantitative Analyst

Filippo Corti
Quantitative Analyst

Marius Rrapi
Quantitative Analyst

This document was prepared in collaboration with Luigi Cutolo, who at the time was working for Iason Consulting.

www.iasonltd.com