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Categories

- Economic
- Environmental
- Geopolitical
- Societal
- Technological

1 Introduction


Global Risk Landscape

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Source: WEF (2019); Global Risks Report 2019
### Environment-related risks

Refers to risks (credit, market, operational and legal risks, etc.) posed by the exposure of financial firms and/or the financial sector to activities that may potentially cause or be affected by environmental degradation.

**Examples:**
- Air pollution
- Water pollution and scarcity of fresh water
- Land contamination
- Reduced biodiversity and deforestation

### Climate risks

Refers to risks posed by the exposure of financial firms and/or the financial sector to physical or transition risks caused by or related to climate change.

**Examples:**
- Damage caused by extreme weather events
- Decline of asset value in carbon-intensive sectors
1 Introduction

Network for Greening the Financial System

- Network of Central Banks and Supervisors
- Established by 8 central banks (including Deutsche Bundesbank) in 2017
- Grown to 36 members and 6 observers, representing 5 continents
- The NGFS is a coalition of the willing
- The NGFS issues recommendations

Mission

- Sharing of experience and identification of best practices on the supervisory and macrofinancial dimensions of climate-related and environmental risks

### Introduction

**Climate change may result in physical and transition risks**

<table>
<thead>
<tr>
<th>Physical risks</th>
<th>Transition risks</th>
</tr>
</thead>
</table>
| Physical impacts include the economic costs and financial losses resulting from the increasing severity and frequency of:  
  - **extreme climate change-related weather events** (such as heat waves, landslides, floods, wildfires and storms) as well as  
  - **longer term progressive shifts** of the climate (such as changes in precipitation, extreme weather variability, ocean acidification, and rising sea levels and average temperatures). |  
  - Transition impacts relate to the process of adjustment towards a low-carbon economy.  
  - Emissions must eventually reach “net zero” to prevent further climate change.  
  - The process of reducing emissions is likely to have significant impact on all sectors of the economy affecting financial assets values.  
  - While urgent action is desirable, an abrupt transition could also have an impact on financial stability and the economy more broadly. |
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Physical and transition risks drive established risk categories

<table>
<thead>
<tr>
<th>Credit Risk</th>
<th>Market Risk</th>
<th>Op. Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical risks</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Flood risk leads to lower collateral valuations and/or unavailability of insurance</td>
<td>• Severe weather events...shift market expectations and increase volatility...put pressure on sovereign ratings</td>
<td>• Business continuity threatened by damage to banks' data centres, branches, ...</td>
</tr>
<tr>
<td>• Droughts increase PD in agricultural sector</td>
<td></td>
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</tr>
</tbody>
</table>

| Transition risks | | |
| • Climate policy (energy standards, carbon tax)...devalue collateral (mortgage portfolio?)...increase PD (energy? automotive?) | • New climate policy or disruptive technology devalue assets in „old“ industries | • Carbon-intensive business models no longer sustainable |
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Relevance for Financial Stability

 guarantee allocation function of the financial system

Financial stability

identify and quantify financial stability risks

Allocation function can be useful for the financing of green investment – at the same time, attention has to be given to the risk of “green bubbles”

physical risks and transition risks might pose financial stability concerns

Greener investment can contribute to a reduction in climate-related risks

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From climate risk to financial stability risks
Transmission channels related to physical risk

Physical risk drivers
- Extreme weather events
- Gradual changes in climate

Physical events translate into economic losses, e.g.:
- Business disruption at suppliers caused by floodings
- Reconstruction costs for (uninsured/underinsured) damages from storms
- Declining human work performance due to heat
- Crop failures due to water stress
2| From climate risk to financial stability risks

Physical risk: weather-related insured losses and the number of natural loss events are increasing

Global insured catastrophe losses (left panel) and number of relevant natural loss events worldwide (right panel)

(1985-2018; left panel: left-hand scale: USD billions; right-hand scale: percentages; right panel: left-hand scale: number of events; right-hand scale: percentages)

- Earthquake/tsunami
- Weather-related catastrophes
- Man-made disasters
- % of weather-related catastrophes losses - 5-year moving average (right-hand scale)
- Hydrological events
- Meteorological events
- Climatological events
- Geophysical events
- % of weather-related events - 5-year moving average (right-hand scale)

**From climate risk to financial stability risks**

Transmission channels related to transition risk

Financial contagion (market losses, credit tightening) feeding back to the economy

**Economy**
- Stranded assets (fossil fuels, real estate, infrastructure, vehicles)
- Reinvestment and replacement
- Increase in energy prices

**Direct transmission channels**
- Corporate assets devaluation
- Lower corporate profitability and increased litigation
- Lower residential property values
- Lower household wealth

**Financial system**
- Financial market losses (equities, bonds and commodities)
- Credit market losses (residential and corporate loans)

**Indirect transmission channels**
Wider economic deterioration (lower demand and output) impacting financial conditions

**Transition events translate into economic losses, e.g.:**

- Coal-fired power plants may be forced to shut down before amortisation
- Costs for adjusting production facilities, e.g. from combustion engines to electric cars
- Increasing (fossil fuel) energy prices reduce profitability of energy-intensive sectors
- Real estate value declines if not complying with latest energy efficiency standards


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Sectoral exposure statistics can provide a first comprehensive approximation of transition risk

Euro area banks’ exposures and sectoral contributions to carbon emissions (left panel); evolution of investment exposures to climate-sensitive sectors (by issuer sector) (right panel)

(left panel: percentages; x-axis: sectoral contributions to total carbon emissions; y-axis: bank exposures (as a share of total exposures); right panel: Dec. 2015-Dec. 2018; left-hand scale: € billions; right-hand scale: percentage of total holdings)

Selected empirical analyzes of European supervisory authorities

Large exposures to reporting firms with the highest emissions

Euro area banks’ large exposures to reporting firms with the highest carbon emissions

(share of total loans)

Selected empirical analyzes of European supervisory authorities

EIOPA: Climate related asset exposures of the European insurance sector

Glossary

EIOPA European Insurance and Occupational Pensions Authority

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EIOPA: Holders of climate relevant exposures and location of investment

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NGFS First comprehensive report 2019: Recommendations

• N°1: Integrating climate-related risks into financial stability monitoring and micro-supervision.

• N°2: Integrating sustainability factors into own-portfolio management.

• N°3: Bridging the data gaps.

• N°4: Building awareness and intellectual capacity and encouraging technical assistance and knowledge sharing.

• N°5: Achieving robust and internationally consistent climate and environment related disclosure.

• N°6: Supporting the development of a taxonomy of economic activities.

Banking supervision: first consideration in the SSM Risk Map for 2019

Sources: ECB and national supervisory authorities.
Notes: The probability and impact of risk drivers are based on the outcome of a qualitative assessment. The assessment identifies the key developments that might materialise and adversely affect the euro area banking system in the short to medium term (two to three years).

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Designing a scenario analysis framework for central banks and supervisors

4 Outlook

Based on whether climate targets are met
- Met
  - Orderly: We start reducing emissions now in a measured way to meet climate goals
- Not met
  - Disorderly: Too little, too late. We don’t do enough to meet climate goals, the presence of physical risks spurs a disorderly transition
  - Orderly: Hot house world. We continue to increase emissions, doing very little, if anything, to avert the physical risks

Strength of response

Physical risks

## Recommendations by the NGFS and European initiatives with a focus on financial stability

<table>
<thead>
<tr>
<th>Monitoring climate-related risks</th>
<th>2019 NGFS Recommendations</th>
<th>2018 EU Action Plan and regulatory proposals &amp; ESRB proposals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulators should develop taxonomies that aim to facilitate (i) financial institutions’ climate risk management, (ii) assessment of the potential risk differentials between green and brown assets, and (iii) mobilisation of capital for green investments</td>
<td>The ESRB has proposed that the European Supervisory Authorities include climate risk scenarios in stress-test exercises, and is conducting analytical work on data and methodologies</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Developing taxonomies</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Non-financial and financial institutions should adopt the FSB TCFD disclosure recommendations</td>
<td>The Commission has proposed a regulation for an EU classification system of sustainable economic activity (taxonomy), which aims to help investors redirect capital towards green activities. This feeds into a Green Bond Standard and disclosure requirements, and could potentially be used in the context of low-carbon benchmarks and a “green supporting factor”</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Promoting disclosures</th>
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</thead>
<tbody>
<tr>
<td>Central banks and supervisors are encouraged to integrate climate-related risks into supervision, among other things, by (i) raising awareness and promoting climate risk assessment among institutions, (ii) setting supervisory expectations regarding governance and risk management, and (iii) potentially considering integrating climate risk into the prudential framework</td>
<td>In its Action Plan, the Commission states that it will explore the feasibility of the inclusion of climate risks in institutions’ risk management policies and the potential calibration of capital requirements for banks as part of the CRR/CRD.</td>
<td></td>
</tr>
</tbody>
</table>

**Source:** ECB (2019): Financial Stability Review, May 2019
Bundesbank activities on green finance and climate-related financial risks

- Membership in NGFS and leading WS 3: “Scaling up green finance”
- Building awareness: e.g. by hosting conferences or informal meetings with financial sector
- Managing reserves increasingly under ESG principles (Environment – Social – Governance)
- Aiming for CO2 neutrality in all activities of the bank
- Internal platform for mutual exchange of information
- Economic and financial analyses on the implications for monetary policy and financial stability
Thank you very much for your attention!

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World

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