

SETTIMANA DELLA SOSTENIBILITÀ

25-28 MARZO 2025



Area Metropolitana Venezia Padova Rovigo Treviso

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Climate Risk Management Framework **Physical risks**

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Venezia Padova Roviao Treviso

Climate Risk Scenarios: NGFS phase IV & Rationals

Source: NGFS Scenarios for central banks and supervisors, 2023



Climate Scenarios considered in ISP C&E measurement framework as of today / approximate positioning out to 2100

Orderly	Net zero 2050 limits global warming to +1.5°C through strict climate policies and innovation, reaching global net CO2 emissions around 2050 but with greater physical and transition risks than in Phase III		
	Below 2°C assumes that countries will limit global warming to +2°C in 2100 (with a 66% probability)		
	Low Demand illustrates the difficult path to reach the +1.5°C limit at the end of the century, with lower energy demand and strong behavioural changes to reach the Paris targets		
Disorderly	Delayed Transition assumes that annual emissions will not decrease until 2030. Strict policies are needed to limit warming to below 2°C		
Hot House World	Nationally Determined Contributions (NDC) energy and emission targets in 2025 and 2030 are met in all countries assuming a moderate and heterogeneous level of ambition reflected in the NDCs in force at the beginning of 2021		
	Current Policies assumes that existing climate policies remain in place, but that their level of ambition is not		
	strengthened		

overall efforts insufficient to emission reductions target

DT choice rationales:

- No "early warnings" of an imminent transition (ie. no discussion on Carbon Tax, CBAM limited, Green House policy downsized, etc.), but..
- Strong and well represented commitment to curb rising temperatures in the long term remains (COP 29)
- A disorderly transitions means severe transition risks and not overly optimistic physical risks
- Other scenarios are too prudential for an impact evaluation (Too little, too late) or limited to assess overall Climate risks (Hot house world)

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Reference scenario for Business Environment Scan exercise and baseline scenario analyses projections

Climate Risk Scenario Analysis in the ICAAP: Different Re-rating simulation shifts and integration into the ISP ecosystem



Physical Risk Engine: Measurement framework overview applied both to NFCs & Real Estate

Physical risk refers to the financial impact of a changing climate, including more frequent extreme weather events and gradual changes in

climate. This can directly result in damage to property or reduced productivity, or indirectly lead to the disruption of supply chains.



(1) Synthetic measure of physical risk indicating the level of risk according to four categories (LOW, MEDIUM, HIGH, VERY HIGH) available for each hazard in perimeter

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Geomorphological features to be inserted into the Physical Risk methodology

Leveraging all the information available as a result of the geolocation phase, it is possible to refine the analysis by using geomorphological characteristics and consequently associating a different risk category with each property (e.g. proximity to a river will increase the risk of flooding), given the same geographical cell



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Materiality Assessment Framework: Physical Risk on Mortgages "Granular heat-map solution"

In order to comply with the expectations of the Regulator on mortgages, it is reasonable to imagine the creation of fixed-grid maps (ZIP code level) that exploit the results of bottom-up processing as of 31.12.2022 on the bank's stock performed with the physical risk engine as part of ICAAP processes



(1) Damage functions are available also for other hazards but not elaborated on 31.12.2022 - TBD inclusion of other hazards

(2) Considering the average level per ZIP code of the first-floor area compared to the total area of the asset, it is possible to change the overall level of depreciation associated with the new collateral (e.g., Avg surface 1st floor: 80%, new collateral surface first floor: 70% → zip code depreciation * 70% / 80%)



RRE: Haircut approach

Operational steps and performed analysis



- Return Period 100 has been chosen as the reference for the analysis because it represents a common level of riskiness for events in Italy and is expected to increase further in frequency in the coming years. To date, it also represents the reference for the construction of river dikes
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Looking at the **flood events between 2012 and 2018** whose Return Period was estimated, about **one-third have RPs ranging from 50 to 100 or 100 to 200**. A **quarter** were classified with **RPs greater than 200** while the remainder were classified among those with **lower risk** (RP5, 10, 20 or up to 50)

Copernicus data on precipitation events in Italy from 1989 to 2018 (1)				
Return Period	Median Daily Precipitation mm	Max Daily Precipitation mm	Min Daily Precipitation mm	
RP 100	100.9	194.2	64.9	
RP 50	91	176.1	58.4	
RP 25	81.2	158.7	52.3	
RP10	69.2	136.5	44.3	



Nat-Cat: Italian exposure

- Italy is one of the EU countries most prone to natural catastrophes due to the numerous and frequent phenomena that have affected and continue to affect its fragile territory and the effects of climate change (such as more frequent and intense weather events like floods, storms, heat waves, wildfires, etc.) are expected to increase its vulnerability.
 - Of 149 natural disasters that occurred in Italy between 1944 and 2018 (source E-MAT Emergency Events Database -) (Hazards that must be covered are shown in red),
 - floods (35%)
 - earthquakes (25%)
 - storms (16%)
 - Iandslides (11%)
 - > over 90% of municipalities are at risk of extreme climate events, especially landslides and floods (source: 2023 Legambiente report).
 - +135% extreme weather events occurred in 2023 compared to the previous year (mainly in Emilia-Romagna, Sicily, Piedmont, Lazio, Lombardy, and Tuscany). (source: 2023 Legambiente report).
 Hydrogeological Risk

In recent years, the number of **climate-related hydrogeological events** and other natural disasters has increased, while the number of geophysical events, such as earthquakes, tsunamis, and volcanic eruptions, has shown a **comparatively insignificant increase**⁽¹⁾. The ongoing climate crisis has affected both the **frequency** and **intensity** of **rainfall**, leading to an **increase in the occurrence of these damaging hydrogeological events**

- Floods are the most damaging natural catastrophes in Europe.
 - Ithe economic losses in Europe may reach €44 billion per year by 2100
- Landslide phenomena also constitute a relevant risk factor in Italy (
 - > 1,000 events per year (source: ISPRA, 2023), 100 of which significantly affect houses, firms, and road networks.

Physical risks directly affect firm revenues and operating expenses. Insurance premiums and maintenance costs would increase in line with the magnitude and frequency of natural disasters, thereby leading to higher operating costs. Natural catastrophes generate physical capital losses, which might eventually require additional investments, exerting upward pressure on leverage. At the same time, revenues would decrease as the physical capital losses would result in a decline in production capacity. (source: ECB (2021) "ECB economy-wide climate stress Test" – Occasional Paper)

Recent studies (Bankit) looks at the exposure of Italian firms to hydrogeological risks events.

- Evidence of impacts from events that took place in Italy **between 2010 and 2018** are:
 - Firms located in municipalities affected by hydrogeological disasters have a 7.3% higher probability of exiting the market compared to others.
 - If they survive, in the three years following, firms experience an average decline in their revenues and employees of about 4.9% and 2.2% respectively. The negative effects are greater for smaller, younger and low-technology firms.
- Evidence of the exposure of italian manufacturing firms at regional level (taking into account the geographical location of manufacturing establishments) is shown on the left figure:
 - for floods blue figure
 - for landslides red figure





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NatCat: the new insurance scheme for business

To manage the risks of natural disasters, Italy has taken numerous measures to mitigate their effects.

- Since the 1980s, Italy has established a civil protection system and implemented modern disaster prevention policies, such as civil protection plans and reconstruction programs.
- Most recently, the introduction (Law 213/2023) of the policy of compulsory insurance (from next April) against damage caused by natural disasters (earthquakes, floods, landslides) for companies with tangible assets on Italian territory.
- Starting from April 2025 enterprises registered in the Italian Businesses Register (Registro delle Imprese) must purchase a policy covering earthquake, floods and landslides. The State will consider the fulfillment of such obligation when granting contributions and subsidies to the enterprises, including those contributions following a Nat Cat event.
- 📕 Are subject to the obligation enterprises registered in the Italian Businesses Register (Registro delle Imprese) alias:
 - companies with registered offices in Italy
 - enterprises with a permanent establishment in Italy
- Also included are:
 - sole proprietorships (imprese individuali);
 - Partnerships (società di persone);
 - Iimited liability companies (società a responsabilità limitata).

The introduced provisions do not apply to agricultural entrepreneurs referred to in Article 2135 of the Civil Code, for whom insurance against such risks remains optional.

- Businesses are free to choose the Insurance Company and, in accordance with the provisions of the regulations, the content of the policy.
- Insurance coverage, at the current state of the law, concerns direct damage, suffered as a result of calamitous and catastrophic events identified by the regulation, to the tangible fixed assets:
 - Iand and buildings;
 - plant and machinery;
 - industrial and commercial equipment.
- **I** <u>The enterprises must take out an insurance policy **by March 31**, **2025**, covering direct property damage caused by:</u>
 - Earthquakes
 - Floods (river floods; pluvial or flash floods; and coastal floods)
 - 📕 Landslides

Businesses that fail to comply with the obligation to take out insurance against natural disasters may thus suffer detrimental effects in the allocation of said public facilities or grants. Moreover, in the event of a claim, these enterprises risk facing large financial losses that may jeopardize the very survival of the business. (In the allocation of contributions, grants or facilities of a financial nature from public resources, including those provided during calamitous and catastrophic events.)

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NatCat: Intesa Sanpaolo view

Intesa Sanpaolo's climate strategy is based on a clear awareness of climate change in terms of risks (physical and transition) and opportunities.

The studies on Italian physical hazards highlights the importance for the Italian production system of understanding its exposure to hydrogeological risks and its evolution in a climate change scenario in order to cope with it. For these reasons, the introduction of a mandatory Nat-Cat insurance scheme for businesses is proving to be a valuable tool in dealing with the aggravation of natural disaster risks.



A counterparty's exposure to physical risks from catastrophic events (e.g., damage to production facilities or warehouses) can result in a **reduction in its creditworthiness**, thereby reducing the ability of borrowers to repay their debt (**income effect**) or the ability of banks to recover the full value of a loan in the event of default (**wealth effect**) affecting estimates of Probability of Default (PD) and Loss Given Default (LGD). Insurance can **mitigate** these effects on the **individual** and **economic levels** and **should increasingly be considered when determining the terms of financing**.

There is a degree of uncertainty about the pathways of climate change in the medium to long term, mainly due to the commitment of national and international policy makers and advances in technology, which may lead the public and private sectors to review their strategies and policies in order to align them with specific climate targets. Scenario analysis is therefore essential as a tool for dealing with the expected impacts of climate change.



Intesa Sanpaolo conducts several physical risk assessments to measure the impact of natural events on the current and expected creditworthiness of counterparties. Specifically, the physical risk model is based on the geolocation of the NFC customer production sites and incorporates climate and econometric scenarios (IPCC and NGFS) to calculate climate-adjusted revenues, costs, profits, and cash flows. These calculations are used to determine the impact of physical events on the counterparty's rating. As result, a level of vulnerability of the counterparty to physical events is provided (LOW, MEDIUM, HIGH, VERY HIGH) for the physical hazard and time horizon considered.

Based on the latest simulations performed by ISP for Pillar 3 disclosure with the NGFS current policy scenario, 2.5% of the amount of credit extended to NFC counterparties have "HIGH" and "VERY HIGH" financial vulnerability to acute physical risk.

In addiction, a recent Flood risk impact simulations of the NGFS Disorderly scenario, shows a trend in the level of exposure prone to flood hazard that is essentially the same between 2024 and 2030, and then increases exponentially until 2050, with the risk doubling its initial value in 2024.

Grazie per l'attenzione!



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