EIOPA climate risk stress test: wrap up, challenges and opportunities

by François Thirion and Frederic Vangheluwe

ABSTRACT

The EIOPA has published a paper on the methodological principles for insurance climate risk stress testing. Although the EIOPA does not define precise scenarios yet, it lays the foundations for future climate risk stress test exercises by detailing the methodologies it considers to use and the requirements it will have toward insurers. The climate risk scenarios considered in future stress test exercises will be multiple, and granular. They will mix physical and transition risk, be ran over long time horizon and impact both assets and liabilities. Insurers will have to compute the impact of these scenarios on balance sheet, profitability and technical metrics.

The EIOPA stress test will be a challenge for insurers, among others in terms of data and modelling. It is nonetheless a great opportunity to build future proof risk management tools able to support the development of a sustainable strategy to leverage the possibilities offered by the climate transition.

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CONTEXT

In January 2022, the EIOPA (European Insurance and Occupational Pensions Authority) has published a paper on the methodological principles for insurance climate risk stress testing. This publication is one of the key deliverables of the 2022-2024 sustainable finance roadmap of EIOPA and aims at enhancing the micro and macroprudential risk assessment of ESG (Environmental, Social and Governance) risks. The methodological note on climate risk stress test complements other recent climate risk related publications made by the EIOPA, among others, a publication on the inclusion of climate risk assessment in the ORSA (Own Risk and Solvency Assessment).

Through climate risk stress tests, the EIOPA pursues both micro and macroprudential objectives. It wants to assess the resilience of individual insurers and reinsurers to climate risks as well as the impact for the insurance sector as a whole. Besides, it aims at understanding the potential implications for future insurability of risks (i.e. to what extend the insurance product offer could be impacted and whether it could create protection gaps).

Although the EIOPA has already published two papers on insurance stress testing, a specific note is dedicated to climate risk because of its intrinsically different nature. Compared to other insurance and financial risks, climate risk differs in several ways.

First, climate risk will materialize over various time horizons. Climate risk stress tests must therefore be carried out over a long period, well beyond the one-year horizon usually considered in regular stress tests, to account for all the potential effects. This raises many methodological questions, among others, whether balance sheets should be projected in a dynamic way (i.e. with potential strategic adjustments).

Secondly, climate risk is a relatively new risk and is forward looking meaning that historical data are of limited use and scenarios must be developed based on many assumptions about future climate developments.

Finally, climate risk scenarios must first be defined on climate related metrics then translated into financial risk drivers. This transcription is not easy and may be source of additional uncertainties. Climate risks are generally split into transition risk and physical risk. Transition risk relates to the risk of financial loss from the climate transition (e.g. regulatory changes impacting the value of assets) while physical risk relates to the financial loss from the physical consequences of climate change (e.g. increasing severity of losses, more natural catastrophes, loss on properties). Specific transmission channels must be identified for each type of climate risk (transition or physical).

At this stage, the EIOPA does not present precise stress test scenarios but explains what methodologies have been considered and chosen to perform climate risk related stress test. More precisely, the paper by the

EIOPA starts by describing how climate scenarios should be designed, and then focusses on how these scenarios must be translated into shocks on financial risk drivers. The metrics considered to assess the impact of the scenarios are then presented. Finally, the EIOPA discusses ways to account for second round effects. The main takeaways of EIOPA's paper are presented in the next section. The challenges and opportunities it creates are then discussed.

Main takeaways

Scenario Design

The EIOPA insists on the need to consider and combine multiple climate scenarios to accurately account for the uncertainty of future climate outcomes. Future stress test exercises are therefore likely to be based on multiple scenarios combining both physical and transition risks. This adds complexity as it will require multiple stress test runs relying on many risk drivers.

The scenario definition will be relatively granular, shocks on climate variables will be defined at regional level while financial impacts will be computed at sectoral level (e.g. for corporate bonds, equities or real estate). At this stage, EIOPA does not consider shocks at individual assets level but it keeps working on it for further analyses.

The EIOPA considers scenarios ranging over a medium to long term time horizon with an assessment of the impacts on the current balance sheet. Separate forward-looking assessment will be required to assess the impact of reactive management actions to mitigate climate risks.

Box 1: Takeaways from the ECB climate risk stress test

The ECB (European Central Bank) will run a climate risk stress test in the first half of 2022. It has published a detailed methodology laying down its requirement in terms of modelling and impact assessment. The ECB requires banks to perform very granular modelling and provide impact assessments with the same level of detail. This poses several challenges to banks among others in terms of data.

To overcome this challenge, the ECB allows banks to proxy some data when they are not available (under some conditions and using duly justified methodologies). The use of such methodologies might help insurers as well to fill in missing data.

Modelling

EIOPA introduces and discusses multiple methods to translate scenarios on climate variables into shocks on financial risk drivers, and then derive the impact on insurers' assets and liabilities.

Regarding transition risks, the EIOPA presents several approaches but does not recommend a specific one (see example in Box 2). Instead, it

considers to rely on multiple modelling approaches to compare and validate the shocks obtained. When selecting a modelling technique, the EIOPA insists on the need to consider whether the selected approach generates sufficiently granular results and whether it makes a consistent use of data (i.e. whether data used by the different modelling techniques are consistent between them).

Considering physical risks, the EIOPA plans to collaborate with climate experts to determine changes to the severity, frequency and correlation parameters for specific hazards (e.g. hail, windstorm, heatwaves…) at the regional level. The EIOPA will also determine shocks on life insurance risk factors such as mortality or morbidity. The impact of these shocks will have to be assessed on liabilities but not on assets. The EIOPA considers that currently no robust methodologies exist to assess the impacts of such shocks on assets. This might change should robust methodologies emerge.

Box 2: Transition risk modelling example - the PACTA model

The PACTA (Paris Agreement Capital Transition Assessment) model, developed by the 2°Investing Initiative (2DII), returns stressed asset values by computing the adjustment in physical production required to align with a 2 degrees scenario (i.e. keep the rise in temperature below 2 degrees). The scenarios can be fine-tuned by changing the timing and intensity of policy actions.

This method relies on highly granular, firm specific data and therefore accounts for firm specific heterogeneity. However, the data required are not available for all firms in all sectors. Besides, this method requires to map the change in physical production to change in asset value which is not feasible for every type of asset.

Impact Assessment

The EIOPA will require to assess the impact of the climate stress scenario, both gross and net of reinsurance, on three types of metrics:

- Balance sheet indicators (e.g., change in own funds, change in total technical provisions…).
- Profitability indicators (e.g., loss ratio).
- Technical indicators related to potential loss metrics (e.g., probable maximum loss). Information on both the expected loss and the tail loss will be required.

Second round effects

The EIOPA does not plan to require insurers to assess the impact of the stress test scenarios using dynamic balance sheet. Potential management actions to tackle the effects of climate change would therefore not be accounted for through the stress tests (mostly because of the technical

complexity and the lower result comparability). To overcome this issue, the EIOPA considers to ask both qualitative and quantitative questions as to how insurers would adapt their business model to climate change. Through these questions the EIOPA wants to further assess both the micro and macroprudential implications of climate change.

Challenges

EIOPA's climate risk stress test will raise several challenges for insurers. First of all, in order to effectively deliver on the stress test, new model developments might be required, for example models to translate shocks on climate variables into shocks on financial risk factors. The range of models to be developed is relatively new, meaning that expertise to develop such models might be limited.

The stress test will be demanding in terms of data as the EIOPA will require projections at a granular level (sector/region). Some insurers might need to acquire missing data and/or reorganize and enrich them to perform the stress test.

Finally, the questionnaire on second round effects might be a real challenge for insurers as it requires them to develop a long term view (potentially up to 30 years) on their strategy in light of climate change. Developing such a long term strategy forces insurers to gather many heterogeneous information to accurately assess what their strategy and product offering could be 20 years from now.

Opportunities

Climate risk stress test and other climate related regulatory requirements (e.g. ORSA) may appear as an additional burden on insurers. They are a good occasion to invest in future proof risk management tools able to accurately assess the potential consequences of climate change on insurer's financial position, and to help insurers design strategies to leverage the opportunities related to climate transition.

Insurers are exposed to climate risk through both their assets and their liabilities. Accurately anticipating climate change impacts and taking actions in due time is key to avoid potential losses on assets (e.g., due to stranded assets) or higher liabilities stemming, for example from bad underwriting or unwanted risk exposure. Developing performant climate risk models can help insurers avoid such undesirable situations.

Climate change will require insurers to adapt their business models. Some types of insurance coverage might become irrelevant while new ones will emerge. The distribution channels or more broadly the client relationship management might also be impacted. To take advantage of these developments, insurers need to develop a clear view on the potential climate change impacts and design strategies accordingly. Again, performant climate risk models will be a key tool to reach such ambitions.

Further readings

Here are a few interesting references to go further on this topic.

EIOPA climate risk stress test methodology

EIOPA Opinion "on the on the supervision of the use of climate change risk scenarios in ORSA"

EIOPA Consultation paper "on Application guidance on running climate change materiality assessment and using climate change scenarios in the ORSA"

EIOPA's methodological principles on insurance stress testing

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