

Discussion Paper: Methodology on potential inclusion of climate change in the nat cat standard formula

Fields marked with * are mandatory.

Responding to the paper

EIOPA welcomes comments on the discussion paper: Methodology on potential inclusion of climate change in the nat cat standard formula.

Comments are most helpful if they:

- respond to the question stated, where applicable;
- contain a clear rationale; and
- describe any alternatives EIOPA should consider.

Please send your comments to EIOPA using the EU Survey tool **by Friday, 26 February 2021, 23:59 CET** by responding to the questions below.

Contributions not provided using the EU Survey tool or submitted after the deadline will not be processed.

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[1] Regulation (EC) No 1049/2001 of the European Parliament and of the Council of 30 May 2001 regarding public access to European Parliament, Council and Commission documents (OJ L 145, 31.5.2001, p. 43).

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[3] Regulation (EU) 2018/1725 of the European Parliament and of the Council of 23 October 2018 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data, and repealing Regulation (EC) No 45 /2001 and Decision No 1247/2002/EC (OJ L 295, 21.11.2018, p. 39).

About the respondent

* Please indicate the desired disclosure level of the responses you are submitting.

- Public
 Confidential

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Questions to Stakeholders

Q1: Do you agree with the definition of the perils?

- Yes
 No

Please explain.

Yes, in general terms we agree. We understand the definition in table 1 as a more precise definition compared to Solvency II Delegated Act.

From an actuarial point of view we welcome the intention of this approach which should align definitions considering various aspects:

- One peril should not cover losses/events triggered by different meteorological root causes. This is important for forward-looking actuarial modelling based on climate scenarios.
- One peril should not combine coverages that are typically handled in different (re)insurance contracting terms.
- Granularity of data available in loss databases (relevant for modelling loss amounts based on meteorological events)

This is further complicated through the fact that a single root cause (or Nat Cat event) may comprise losses from different perils which are potentially not covered completely.

The climate driven definition makes sense in the context of climate change modelling. We basically agree to the definition but recommend further elaboration on the reasoning behind the definitions (especially regarding the consistency to the above mentioned aspects).

The EIOPA definition of perils should be consistent to (vendor) models used to (re)calibrate the SF.

It is not always easy to split/separate the specific peril or identify it in the claims data for back-testing purposes. It generally depends on the vendor models and their definition. It would be good to have more explicit definitions to ensure that all risks are captured, and none are double-counted. In particular:

- Coastal floods (storm surge) and ice-jam floods should be excluded from SF Peril Windstorm and be included in SF Peril Flood.
- SF Peril Hail should only consist of Hail and should not include losses from tornadoes, lightning, strong wind, and heavy showers.
- Same for convective storms. We are not sure whether convective storms are included within WS or not.

We note additional issues:

- Hail is characterized by hailstones whose diameter can vary from a few millimeters to about twenty centimeters in the most extreme cases. While this peril happens during wild storms, the effects are very storm specific. Windstorm currently covers a large number of perils which are not linked to the same underlying phenomena.]
- One issue can be the differentiation of flash flood and heavy showers, which is unclear to us: Flash flood (part pluvial) is in the peril "flood" whereas heavy showers are in "hail".

Q2: Do you think that it should be clarified that the peril currently named "Hail" in the SF refers to "Convective Storm"?

- Yes
 No

Please explain.

We agree that undertakings would benefit from more clarity in the definitions of hail and all other Nat Cat perils to determine the correct treatment and the policies which would trigger losses for such perils. We also suggest that it would be sensible to align the peril names/definitions with commonly used terminology in policy wordings across the market.

A mapping would be helpful to explain the differences between the SF and EM-DAT definitions that are not obvious.

Q3: Do you think that the peril currently named “Hail” in the SF should be renamed as “Convective Storm”?

- Yes
 No

Please explain.

Hail is a subcategory of convective storm. In some cases, strong winds follow hail and vice versa - it is often challenging to separate the effects of strong winds (e.g., Derecho) and hail. Also, hail has specific characteristics (i.e., hailstones) resulting in different original policy conditions affecting different types of insured objects and resulting in various losses.

In addition, it would fit with the definition of the cat modelling agent making easier the potential comparisons

See our response to Q2 where we referred to common terminology. It needs also to be considered that the term “hail” is commonly used in reinsurance contracts. In any case hail is the primary effect of convective storms in Europe.

Q4: Do you think that it should be clarified that the peril currently named “Windstorm” in the SF refers to “Cyclonic storm”?

- Yes
 No

Please explain.

Yes, this is more aligned with the market standards. The perils windstorm/hail should be defined in a way that facilitates modelling.

Cyclonic storms are more material for coastal countries; rather than inland, there should be a more precise definition of what is understood as a windstorm. The use of the standard formula is aligned with the calibration. (As inland countries are less exposed to cyclonic storms and more impacted by convective storms) however, their understanding of windstorms perils might be different. Thus a mapping is needed to explain the differences between the SF and EM-DAT definitions that are not obvious.

The French Institut des actuaires believes that this peril could be split into two types of perils: cyclones and extra-tropical cyclones. The origin of those perils is different and therefore should not be part of the same definition. For cat modelers, there are two different models as well.

Q5: Do you think that the peril currently named “Windstorm” in the SF should be renamed “Cyclonic storm”?

- Yes
 No

Please explain.

There is a clear distinction regarding cyclonic storms and convective storms, and inland countries are more exposed to convective storms than cyclonic storms. Both types of storms have different properties, impact, volatility, and severity. Most vendor models separate cyclonic storms and convective storms. Both should follow different calibration methods as convective storms are more localized, hence inherently having different risk characteristics.

Another reason the terms should remain unchanged is that these are used in contracting.

Q6: Do you agree with the risks identified where there is a high confidence level on the current and short-term impact of climate change in Europe?

- Yes
 No

Please explain.

In general we agree. But, we do not agree with respect to hail or convective storms as a risk having a high confidence level on the current and short-term impact of climate change. As stated in the discussion paper in figure 3 on page 17 and in Annex B as well, there is reduced confidence about an increasing hail & tornado risk – although we agree that there are indicators for an increasing risk.

It should also be considered, that based on local climate change scenarios published by local meteorological authorities, the confidence level may vary by member state and peril.

We agree with observed trends but note that some risks need to be considered together:

- Storms are more and more humid so that windstorm and heavy precipitations become one event.
- Similarly, there is an increased correlation between storms and floods. As to Cyclonic Storm, there is no information on the wind speed to infer any trend.

Subsidence insurability can be subject to debate and intensive discussions in some Member States. If, following a court decision, insurers have to cover this risk, this should be included in the Standard Formula taking into account the legal framework.

Q7: Do you agree to refer to a 1.5°C warming scenario for short-term (5-10 years) projection of climate change?

- Yes
 No

Please explain. If no, would you suggest an alternative scenario?

According to IPCC SR1.5 the global average temperature level of 1.5°C is expected to be reached approx. in the year 2040. As a reference scenario the level of 1.5°C seems appropriate as it is probable in the next decades and well-known and much scientific research is available. The respective recalibration should interpolate between “today” and this scenario.

However, we would disagree about to refer to a 1.5°C warming scenario for the very short-term projection. As stated in 3.15, there is a 20% chance that the annual global temperature will exceed 1.5°C in at least one of the following five years. So the assumption, that the temperature will definitely rise to or above 1.5°C in the short-term projection, would lead to an overestimation of the short-term risks. We like to suggest to clarify, whether it is assumed that the temperature would rise above 1.5°C within the short-term projection, or whether the development of climate change would follow the RCP 1.9 (or the RCP 2.6) pathway.

We note also that there may be some practical issues with converting a 1.5 degree temperature increase scenario to a 1-in-200 loss.

Q8: Do you agree to take into account adaptation measures when assessing weather-related risks?

- Yes
 No

Please explain.

When assessing weather-related risks regarding climate change, adaptation measures (e.g., public and private adaptation measures) should be excluded and included to measure the adaptation effect and to assess weather risks. Mitigation measures (objective of action on the factors of climate change despite a significant level of uncertainty) and measures to adapt to the consequences of change (objective of maintaining equivalent living conditions despite climate change) should be taken into account. Insurers and reinsurers should be more proactive on this front to help citizens, cities and states to invest in such these measures. Some adaptation measures may be easier to take into account (e.g. river flood risk managed by the State) while other measures are more difficult to quantify or too long term (e.g. building resilience).

Public adaption measures as well as generally used private adaptation measures (i.e. building standards) are essential for assessing realistic claim amounts and therefore should be considered.

It would make sense for the risk management to consider individual adaptation measures as well (i.e. contractual deductibles or the resilience of buildings actually insured) - however this could result in an overcomplicated SF.

Our expectation is that current adaptation measures are implicitly included in the existing parameterisation so it would appear reasonable to follow a similar approach for any recalibration in the context of climate change.

[As an example, for Ireland it should be assessed whether it is likely that additional adaptation measures will be put in place before the next recalibration date which may render inappropriate a recalibration based on historical claims data only. Refer to question 22 for a data source to help make this decision on the basis that Flood is introduced as a peril for Ireland. A policy paper produced by Grantham Research Institute on Climate Change and the Environment titled "Fit for the Future?" provides some additional background to adaption measures from an Irish Flood perspective.]

Q9: Do you agree that in light of climate change, it is necessary to explicitly consider climate change in the recalibration of the Nat Cat SF for certain perils/regions as identified in Part 3?

- Yes
- No

Please explain.

This seems reasonable, subject to whether this would have a material impact. We also note the comment in the discussion paper regarding the delay between the data used in any recalibration exercise and its implementation. This is important to consider in the context of the framework for recalibration as discussed in Q20.

Models are not calibrated each and every year, it is important to include the potential impact of climate change in the next 5 to 10 years. It is important to explicitly point out the quantum in the parameters' calibration attributed to climate change. However a cost / benefit analysis must be run to check the feasibility of the inclusion of such explicit variables.

It is generally accepted that – when it comes to climate change – historical data is not representative for future development. Climate change has had a material effect on the global temperature only in the last 50 years – with continuous increase of temperature. These 50 years are the typical period of historical data used for calibration of vendor models. Obviously, climate has changed during these 50 years and the average climate of this period is not the climate to expect in the future. Therefore, the statement “Any current climate change will be implicitly included in the recent data (historical data about the events or the losses)” (par. 4.6 on page 24) has its limitations: as Nat Cat events are quite rare, many years of historical data are needed for calibrating – but only very few years of the current climate change are included in the historical data. Consequently, the statement “climate change is implicitly considered in current vendor models” (see par. 1.8 and 4.3) should be reasoned. Especially, as climate change is expected to have non-linear effects, an explicit consideration of future climate change in the recalibration is necessary.

That said, it will also be useful to investigate the extent to which climate change is implicitly captured in the existing parameterisation process. Many initiatives are currently taken on climate change and there is a risk of adding climate change to climate change. So we need to consider whether Best Estimate already includes climate change resulting in a shifted distribution. SCR CAT Review should then be complementary to reflect increased uncertainty. Stress tests are an important tool to assess climate change risk.

Firstly, we would have to define the "baseline" and then define the impact of climate change. Then, the Nat Cat SF's calibration should be based on the time horizon of implementing the next recalibration.

It may be essential to limit the risk of unjustified penalization of certain Member States from a competitive advantage and competitiveness perspective. Besides, the premium volume, Lines of Business characteristics, and sums insured will allow the risk of climate change to be considered. Indeed, the insured goods' materials will change due to climate change, which will lead to price and valuation changes. Hence, adaptation measures need to be taken into account for the calibration as well.

Q10: Do you agree that for relevant perils/regions where climate change is expected to have an impact, Nat Cat models explicitly considering climate change should be used if available?

- Yes
- No

Please explain.

This appears reasonable; generally, any relevant data sources should be considered to some extent in any recalibration exercise. It may also be useful to consider in the context of a formalised framework to determine thresholds for materiality with respect to specific perils in different regions.

Given the expected non-linear effect of future climate change, Nat Cat models using explicitly climate change models as a basis, should be used for recalibration of the standard formula by EIOPA. Generally, any relevant data sources should be considered to some extent in any recalibration exercise.

Vendor models should implement forward-looking (local) climate change scenarios (based on various time horizons) that can be selected to model the impact of climate change on physical risks.

Note that, while we welcome international platforms, local expertise should not be disregarded. This is especially the case for smaller countries where their specificities would not be properly captured. The models used can lead to significant different outputs.

Q11: Are you aware of models, which would explicitly consider climate change which could be used to perform the Nat Cat SF parameters' calibration?

- Yes
 No

Please explain. If yes, please provide information about models.

It is crucial to use widely used market available vendor models supported by scientific evidence and validation. It is essential to preserve predictability and stability regarding the standard formula to allow insurers to plan and take appropriate actions regarding the risks in their portfolio. However, there are some promising initiatives at a local level like "Climate Adaptation Services" in the Netherlands. In France, ARPEGE (a tool from the company Météo France) deals with climate change.

The larger cat model vendors are starting to adjust their existing tools to deal with the climate change demand. This is peril dependent. Adjusting the model parameters to current climate state is a first step. Then allowing for sensitivity analyses/stress tests for future climate will follow. Reinsurance brokers have also developed proprietary cat models and are following the same approach.

On the perils most sensitive to climate change, like European flood, smaller niche vendors (e.g. JBA) are starting to appear and can share their models on new open access platform like OASIS/Nasdaq Risk Modelling for Catastrophes. Existing vendors are also starting to share their models on such platforms. This is developing a new offer in the market. Data privacy and cloud management is a potential hurdle for this new development.

Other:

- In top of models, robust datasets of future scenarios are starting to be used in the market. EURO-CORDEX and PESETA IV is an example for flood and has been sponsored by the European Commission.
- We are aware of vendor models used in asset management which are based on explicit climate change models (e.g. 427 "four-twentyseven").
- The ECMWF Copernicus Climate Change Service may also be useful in in respect of Flood Risk in Ireland.
- There are some regularly used models by Meteorologists such as CMIP 5 but is not fully available and require meteo knowledge hence a price to pay to handle properly.

Q12: Do you think that new countries should be considered in the SF in light of climate change?

- Yes
- No

If yes, please explain which ones, why and provide sources of data/studies.

European insurers are looking for growth relays in North America, Africa, and the Middle East. It could be interesting to include them. In order to be prudent all countries that have been impacted in the last decade with a high severity and penetration should consider being included. It might be useful to adopt some threshold system when a new risk/territory should be added to allow greater transparency.

Specifically,

- the Netherlands should be included for flood to create awareness about and more insight into the protection gap and its impact on society and economic losses. To be considered: Currently the coverage in general is usually limited to flash flooding, while all floods related to the overflow or failure of primary watersystems (sea and big rivers) cannot be insured.
-
- For Germany it should be evaluated to include subsidence. For the Netherlands flood might be valuable to be included.
- Flood risk in Ireland is increasingly prevalent and should be considered in any future recalibration exercises.
- Coastal flood should be added in France and Spain since there have been many occurrences in the last 3 years.

[Sample data sources and discussion papers available on Irish Flood Risk:

- Grantham Research Institute on Climate Change and the Environment "Fit for the Future - an assessment of Flood Risk"
- Department of Finance Public Consultation on Climate Change and Insurance in the context of the 'Climate Action Plan 2019 to Tackle Climate Breakdown
- The Office of Public Works have a national flood information portal, providing location specific access to flood risk and flood management information.]

Q13: For new perils, EIOPA has focused on wildfire. Do you see additional "new" perils which could be of relevance for the SF?

- Yes
- No

If yes, which ones?

First of all, in respect of wildfire, the exposure is different in the different EU countries. In most countries, the insured risk associated to wildfire is limited to properties and vehicles. Only a few countries have the forest insured by the private insurance sector. So the scenarios should be different based on the insured exposure. The exposure might depend on the share of forests in total land use. This differs a lot from country to country and the effects of climate change on temperature and precipitation levels will differ as well. Also illnesses and plagues (the state of the forests) are important.

Other potential perils to be considered

- Drought could also be of relevance for the SF for various regions. It might create additional risks to

crops, buildings, and industrial sectors. It could also be relevant to assess the transition risks.

- In addition to drought the agro sector is exposed to different climate developments like illness associated to climate impact, precipitation and spring freeze.
- We could also consider heatwave. There has been an increase in frequency and severity, however there are currently no vendors models.
- We would recommend clarifying coastal flood: this should not be considered as a new peril but be associated to the Windstorm peril as it is the case in the UK but not in Belgium and other European countries.
- Severe Convective storms can also be impacted by climate change and could have damaging impact depending on possible high concentration of exposures.
- Subsidence is another peril which is very sensitive to climate change and a scenario should consider the soil nature.
- Landslide could be considered for Alpine regions. However, yet it doesn't seem to be significant.
- It may be interesting to analyze the extent to which volcanoes and marine submersions can be taken into account.

Consideration could also be given to secondary perils (i.e. which of the perils that occur following significant events).

It would be necessary to check whether considering new perils within CAT NAT sub-module creates any overlap with other submodules as premium and reserves risk, and if so, to select where best to capture such a capital requirement.

Q14: Do you think that wildfire could potentially be material enough for the insurance sector to be considered in the SF?

- Yes
 No

Please explain.

Yes, it appears reasonable that this should be considered, particularly as events which have already happened are captured in pricing data and therefore covered under Premium Risk – it would therefore be consistent to also consider this in the Nat Cat module.

Depending on various aspects like regional area and likelihood to affect insured objects and lives. Besides, there should be tighter co-operation between national regulators and EIOPA where national regulators can analyse insurers' ORSA and Risk registers and notify EIOPA regarding potential new risks (emerging risks).

[Note from Germany: So far, an accumulation event of several building destroyed by wildfire has only occurred once: Siegburg 2018 (eight houses on fire along an ICE railway due to heat). The awareness of such events should be created nevertheless. And further research would be appreciated. As a first step it should be elaborated how large a 1:200 event as of 2018 could have looked like.]

Q15: Are you aware of models or data which could be used for the calibration of parameters for wildfire risk in Europe?

- Yes
 No

Please describe the data and/or models.

Concerning wildfire we are not aware of any specific models.

One could check whether the data from Copernicus and its databases can be used to start such a model calibration. Also Eurostat registers information on forest exploitation.

[We note the examples of Portugal with a few major events, and also Greece and in northern Europe countries (Finland) as well. Drought is one of the drivers of such potential issues as well as building of houses near forests.]

Q16: For new lobs, EIOPA has focused on agricultural insurance and NDBI. Do see additional lobs, which could be of relevance for the SF?

- Yes
- No

Please explain. If yes, please provide lobs names.

Non-Damage Business Interruption

- NDBI is a relatively "new" emerged risk in light of the covid-19 pandemic. Many insurers have either explicitly excluded NDBI from their ongoing policies due to a lack of appetite for such risk. It could be added as a form of a specific scenario. However, one would be hesitant to include this in the Catastrophic exposure's calibration due to the newly implemented exclusions. It is probably out of the scope of this consultation paper. In the context of NDBI, our view is that it would be difficult to assess materiality; furthermore, calibration may prove difficult if there are varying levels and types of cover available in different markets.

Other

- Some other lines of business which may be considered include travel and event cancellation. However, these are already captured in the Miscellaneous Financial Loss module and it is difficult to envisage how this could be calibrated for Nat Cat without requiring changes to the other areas of the Catastrophe Risk module for these classes, which already implicitly allow for Nat Cat losses among other sources of loss.
- Cyber risk (man-made scenario) in the light of the covid19 and change of the traditional operational model) could potentially be added to the SF with many insurers exposed due to "silent" covers.

Q17: Do you think that crop insurance could potentially be material enough for the insurance sector to be considered in the SF?

- Yes
- No

Please explain.

We agree that crop insurance may potentially be material for some insurers. Whilst it may not be material for the entire insurance sector at the moment, it is likely that it may become material in the future. This will increasingly be covered by parametric insurance. Crops can be impacted by several natural disasters like drought and hail and therefore should be included in the scope of the SF Nat Cat Risk especially because some insurance companies are heavily exposed to this specific LoB in limited territories. We note that the paper mentions a lack of models available in Europe; also, we expect that crop insurance is likely more material in non-EEA markets.

Analyses indicate an increasing demand for crop insurance as frequency and severity of almost all events / risks covered by crop insurance increase driven by climate-change (e.g. flood, hail, fire/wildfire, drought). Therefore, we would like to encourage EIOPA to analyse the outlook for and impact of climate change on crop insurance in more detail. For its activities and discussions EIOPA should take into account that it takes a few years to effectively integrate new risks and LoBs (along with the risk factors needed) into the SF as already elaborated by EIOPA. With regard to a particular insurer, proportionality and materiality of the risk should be considered.

However, in the current set-up of the SF Nat Cat SCR, country factors would to be recalibrated for the remaining kind of risks (e.g. civil risks, commercial risks, industrial risks) if agriculture risks are to be calibrated separately.

Q18: Do you think that adding a loading factor is the right approach to capture climate change?

- Yes
 No

Please explain.

In principle, such an approach would avoid excessive volatility from frequent recalibrations and may be appropriate given the uncertainty inherent in the recalibration process. Historical data already included in the parameterisation should be excluded to avoid double-counting. In this context it is important to note the source of such a factor - care should also be taken as there are likely differences between a hypothetical loading factor in the tail compared to the mean of the distribution.

It should also be considered that using a global loading factor will reduce the Nat Cat SF SCR's appropriateness if the composition of the underwriting portfolio is not in line with the reference portfolio used to determine a global loading factor.

On the one hand, introducing a climate change-related weight factor per type of risk (i.e., civil risks, commercial risks, industrial risks, and agriculture risks) is more appropriate to determine the SF Nat Cat SCR because it takes into account the change in vulnerability of the hazard for each type of risk due to climate change. On the other hand, such a more advanced approach of disaggregating and integrating separately the effects induced by climate change and those driven by natural catastrophe events net of climate change into the SF may not lead to better results if this is being done based on sparse data. Thus a loading factor approach may be a reasonable proxy depending on the costs and benefits of the two potential approaches.

We would expect a recalibrated multiplicative loading factor by peril but not by country.

A difference should be made between perils where models exist and stress testing is possible, (like extra tropical cyclones, flood, Severe convective storms) and perils where such models do not exist in all countries (like subsidence, drought impact on agro). For the first list of perils, the scenario should consider a modelling approach to climate change, e.g. referring to the Peseta IV/Euro Cordex database for flooding. A loading estimated from these models is then an acceptable approach.

Climate change is not all about severity. Climate change will have an impact on the frequency of some perils. A review of the number of events to consider for a specific year could sometimes be more appropriate than adding a severity loading. In this context, EIOPA could consider reassessing the current scenario based SF SCR Cat approach as it limits the number of storm/hail/flooding events to 2 per scenario.

For other perils where no model currently exists, the loading factor could be an option which should be

replaced in any further review if robust models have appeared in the meantime.

We would like to add that the management of loadings should be made in a reasonable way. Climate change will not have a negative impact on all perils. For Extra-Tropical cyclones, there is currently no signal confirming a worsening of the hazard. Any loading factor should also take into account the impact of possible resilience measure. Flood is again a good example where infrastructure work or new technologies (eg the Prague mobile defences) can help in mitigate the impact of climate change. A loading will also depend on the portfolio profile and more specifically on possible high concentration of exposure (e.g. hail).

We understand that the current calibration implicitly takes into account climate change but only to some extent and, thus does not fully reflect the effect of climate change. The loading factor would then be added to the risk factor to seeking for a full reflection of the effect of climate change. The loading factor could also be a time dependent vector allowing for an increasing effect of climate change. When applying such an approach EIOPA should provide transparency on the derivation of the factors and the factors itself.

We note also that entities with sufficient knowledge about this risk could use an internal estimated capital approved by the regulator, and therefore not be hit by a loading factor.

Q19: Do you think that revaluating the correlation matrices is the right approach to capture climate change?

- Yes
- No

Please explain.

Yes, with reservations:

- It appears a reasonable approach given that climate change will likely have an impact on the diversification between countries/perils.
- However, this approach is complicated because, in order to take into account all climate change-related uncertainties, it may be too granular. While correlations are very important, we could end up with an over parametrisation if the correlation matrix has a too fine resolution (LoB, Cresta level)

We note also that

- It could be a reasonable approach for some perils but not for the majority. Extra tropical cyclones and flood could see more correlation with climate change in view of the increased humidity in the air.
- Correlations between atmospheric perils may be unclear, unless the approach is an improvement on the current expert-judgement based correlation factors and supported by science.

[Other comments

- Correlation between different lines of business could also be reviewed for climate change impact, e.g. property and motor own damage for flood and severe convective storms.
- Correlation between wildfire and subsidence may be worth considering.]

Q20: Do you agree that there is a need to formalise an approach to re-assess current Nat Cat SCR parameters on a regular basis?

- Yes
- No

Please explain. If yes, how often should this take place? Who should participate to such a reassessment? What should be the parameters considered?

We are of the opinion that insurers will need to discuss with climate change scientists, model vendors, FCA in order to reassess current Nat Cat SCR parameter on a regular basis. The frequency of reassessment of the Nat Cat SCR parameters should not be too high to have sufficient hindsight and avoid undue volatility. Reinsurers tend to review their parameters every 3 years.

Regular recalibration balanced against avoiding excessive volatility appears to be a reasonable aim; therefore, the 3-5 year horizon mentioned appears sensible to allow for various changing conditions regarding climate change, insured objects, policy conditions, building constructions, etc.

In this context, a formal approach for recalibrations is appropriate, in particular in establishing the process for determining materiality thresholds for adding/removing/amending parameters, the data sources to be used, stakeholders involved, etc.

Some examples of stakeholders include:

- Catastrophe Modelling Specialists
- Insurance groups using internal models
- Government bodies which may provide details on future adaptation measures and any relevant legislative changes, state insurance pools, etc.
- Meteorological agencies such as national Met departments and intergovernmental agencies such as ECMWF

It may also be necessary to consider expert judgement to supplement historical data given the inherent uncertainty (this should also be addressed in any formal framework implemented).

Given the significant impacts, it is important to be able to justify and explain the changes. It would help if the process and calculations of this recalibration were accessible to everyone to understand the logic behind it.

Q21: Do you agree that regular recalibration is needed but under the condition that the changes are material in order to not include artificial volatility?

- Yes
 No

Please explain.

It makes sense to not introduce non-significant changes to the standard formula through recalibration. With a re-assessment interval of 5 years relevant changes would come without a huge delay anyway. The recalibration time frame of the standard parameters for the NAT CAT risk module of every 5 years seems reasonable and will help to avoid artificial volatility. We welcome the criteria on materiality and artificial volatility but ask for further clarification on their definition and related methodology. The framework referred to in Q20 should also consider how materiality thresholds are established. Changes need to take into account the return period of high severity claims. However this should be monitored since frequency may also increase so the materiality threshold will require a big scrutiny.

Recalibration should only be executed if the changes at a predefined level (e.g., country-level) are material. It might be beneficial to implement some corridor system. If the change is within a specific corridor, then no recalibration is necessary. It is critical to maintain the stability of the standard formula. There is a need for documentation to explain how the parameters have been derived /calibrated. This documentation will help

companies to understand the difference between their models and SF. Besides, there could be Ad-Hoc consideration for recalibration following a significant event/new emerging risk.

It would be helpful if EIOPA were to release revised versions of the NAT CAT helper tab with each recalibration.

Q22: Do you agree that any recalibration should take in account adaptation measures in a future calibration?

- Yes
 No

Please explain. If yes, do you have any insights on how this can be done?

When assessing weather-related risks regarding climate change, adaptation measures should be both excluded and included to measure the adaptation effect. We consider it would be too complex to anticipate future adaptation measures as part of the review process. However, those that are observed over the 3-5 last years, should indeed be included in the recalibration.

Adaptation measures should be taken into account by the vendor models. However, it is nearly impossible for them to take this into account every year like building of roads, parkings etc. Recalibration should reflect risk as much as possible without any overestimation.

[Some examples from Ireland

- The Office of Public Works (OPW) is an Irish government office whose primary function is to support the implementation of government policy. They have made available a national flood information portal, providing location specific access to flood risk and flood management information. e.g. Flood plans are available which set out the roadmap for both investment and policy decisions for the coming 5-10 years. This information can be used take into account to adaptation measures in a future calibration. Office of Public Works (www.gov.ie)
- Another company, Ambiantal Risk Analytics, combine advanced flood modelling, predictive analytics and machine learning to give (re)insurance organisations the critical insight they need into flooding and flood risk. They have also helped customers such as Zurich, Hastings, QBE and FloodRE to better understand the future impact of changing rainfall patterns on flood risk so as to assist. They may have some insight regarding how to allow for adaption measures as they discuss the following on their website "The Irish government, and other governments around the world, are developing strategies on climate change adaptation. Understanding the potential impact of climate change on flood risk is essential in prioritising natural flood management measures and guiding local flood management schemes. Climate change risk assessments are also fast becoming a critical and mandatory requirement for developing and maintaining any type of national or regional infrastructure. Transport and communication networks, energy and water supplies are all facing an increased risk of flooding."]

* Q23: Do you have any other comments on the draft Opinion?

- Yes
 No

If yes, please provide these other comments.

We welcome this discussion paper on Nat Cat perils (general insurance).

- We suggest extending this work to health insurance, to disability and life insurance and to liability insurance. Current analyses in context of climate change focus very much on transition and physical risks, whereas there is a low level of activity on litigation risk and other risks to people. Even though, other LoBs e. g. environmental liability insurance might not be material for most insurers applying the standard formula, it may become relevant in the future.
- Where a forward-looking approach regarding the impact of climate change is in scope, there should also be a consensus about the selected climate change scenario(s) and time horizon(s). Besides, it is critical to improve the calibration documentation and how the SF parameters were derived and selected. This documentation will improve insurers' understanding of the SF. They will be in a much better position to assess the potential gaps and appropriateness of the SF.

Contact

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