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Consultative Document: Principles for the effective management and supervision of climate-related financial risks

Dr. Dahlmeier Financial Risk Management AG is a financial risk management company with a focus on climate change. Our core competence lies in the comprehensive modelling of climate change, the transition and the forecasting of its effects on the economy and its impact on the financial sector.

Climate change is one of the biggest issues and the fast and exponentially developing transition also poses risks that need to be managed. The upheavals resulting from the transition can take on dramatic proportions and they will also entail considerable risks for the financial sector. In its book The green swan, BIS points out this issue. It is therefore logical to focus on the emerging risks with regulation. With its approach of identifying emerging risks at an early stage, BIS is taking a new, forward-looking approach. We welcome this approach and consider it best practice.

As this new approach is under development, we would like to contribute to its further development.

Q1. *Has the Committee appropriately captured the necessary requirements for the effective management of climate-related financial risks and the related supervision? Are there any aspects that the Committee could consider further or that would benefit from additional guidance from the Committee?*

Response: Modelling climate change, including the transition, is a key aspect of forecasting the upheavals and preparing for the coming upheavals. Nevertheless, almost all models have significantly underestimated the speed of the transition. This highlights the importance of model risks in an exemplary way.

This BCBS Consulting Paper does not directly address model risk and its management. Therefore the

Recommendation: The Principles for the effective management and supervision of climate-related financial risks should explicitly include model risks and their management. In particular, model validation should be a core aspect of model risk management. The standards that have been best practice in banking risk management for more than a decade should also apply to the climate change models used in banking.

Background:

Among other things, BIS has commented in detail on model risks in the book The green swan. Two modelling aspects are highlighted: climate change modelling and risk modelling itself. BIS explicitly points out the weaknesses of most of the existing risk models. Due to their backward-looking character, the models used in the FS sector threaten to become a risk themselves in a rapid transition. They are unable to recognise emerging changes.

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New approaches are needed to recognise the effects of a potentially rapid transition. Aware of the weaknesses of previous models and the risks inherent in modelling, the model risks, BIS calls for new epistemological approaches in The green swan.

A highly topical development in the modelling of the energy transition can be understood as a new epistemological approach in the sense of the green swan. Oxford University, Rupert Way, Matthew Ives, Penny Mealy and J. Doyne Farmer, published a Working Paper[1] on *Empirically grounded technology forecasts and the energy transition* on 27 September 2021.

This new approach not only provides a new modelling of transition, it also provides an analysis of the failure of many previous models of transition. In particular, the prevailing Integrated Assessment Models (IAMs) were consistently found to be inadequate. In principle, the IAMs significantly underestimated the expansion of renewable energies (RE) as well as the associated cost degression in RE. However, it would not have been necessary to falsify the forecasts by the actual development in the following years. Even the consistent application of the validation standards commonly used in the FS sector shows that the IAMs rarely meet these standards.

However, the application of these validation standards to the modelling described in *Empirically grounded technology forecasts and the energy transition* shows an exceptionally high validation quality, both in sample and out of sample. A similar model, already developed at the beginning of 2018, has a coefficient of determination of R2 = 0.9841, which also shows its superiority over the IAMs. In addition, the model impresses with its high forecasting quality; the forecasts were made on the basis of the four-year history.

With their validation quality, the empirically grounded technology models provide a reliable basis for forecasting change. This goes far beyond the creation of scenarios. Thus, these models are a good starting point for the creation of scenarios, as they are often used for reasons of simplification. With the help of these scenarios, the weakness of the most common risk management systems, the backward-looking character, can be greatly mitigated.

Summary: The consistent and universal application of validation standards for risk models used in the banking sector should also be mandatory for climate change models used in banking.

Q2. Do you have any comments on the individual principles and supporting commentary?

Due to the outstanding importance of model risks in the topic of climate change-related financial risks, consideration should be given to supplementing the principles with an individual principle on model risk management. As an alternative, but not an equivalent one, model risk can be included under operational risks in Principle 11. The topic could be further developed in the supporting commentaries.

[1] https://www.inet.ox.ac.uk/files/energy_transition_paper-INET-working-paper.pdf