Annex

Good practices on integrating climate-related risks into internal capital adequacy assessment process and capital planning

Many authorized institutions (AIs) have proactively enhanced the internal capital adequacy assessment process (ICAAP) and capital planning framework in response to changes in regulatory standards and emerging risks. This annex summarises the good practices and approaches that the HKMA observed from recent supervisory reviews of AIs integrating climate-related risks into their ICAAP and capital planning. While regulatory requirements on climate risk management may continue to evolve, AIs should draw on these good industry practices and observations, and take steps to enhance their processes and frameworks as appropriate.

I. Identification of material climate-related risks

Key observations

Risk identification is not only an essential component of effective risk management, but also the building block of a robust ICAAP, hence capital planning framework. Proper risk identification is particularly important for integrating climate-related risks into the ICAAP given the evolving and uncertain nature of climate change and policy responses, as well as their complicated transmission channels.

Many AIs have conducted regular analyses to identify climate risk drivers and transmission channels, and determine the materiality of their exposures to climate-related risks. While the scope and depth of these analyses varied across the AIs, consistent application of the insights derived from the analyses in the ICAAP indicated that these AIs have had strong commitment to proactively incorporating climate risk considerations into their core risk management processes.

Good practices

Some AIs demonstrated good practices in identifying and assessing climate-related risks under a coherent framework. Such a framework in general begins with systematic identification of risk drivers and exposures, which are then used for developing a climate risk heatmap to facilitate the formulation and assessment of business strategies. These key elements, as elaborated below, inform and support the necessary enhancements to the ICAAP and capital planning framework for capturing all the material climate-related risks.

1. *Identification of climate risk drivers* – Thorough and structured identification of risk drivers underlies the effective integration of climate-related risks in the ICAAP and capital planning. Making reference to publications by the Basel Committee, the Network for Greening the Financial System (NGFS), academia and other reputable research institutions, a number of AIs conducted comprehensive analyses to pinpoint the relevant physical and transition risks, as well as the detailed transmission channels through which their portfolios and operations would be

affected. With explicit mapping to the eight traditional inherent risks[1], this approach has helped ensure that the identified climate-related risks were captured holistically under the AIs' established risk governance and management framework.

2. *Identification of risk exposures* – Building on the identified risk drivers and transmission channels, the AIs adopted a multi-dimensional approach to assess their exposures to climate-related risks. This process involved segmenting asset portfolios by business line, asset type, client profile, collateral type and geographical location. By doing so, these AIs gained a clear understanding of the specific vulnerabilities across different portfolio segments and risk types. In addition, the AIs scrutinised how their business activities and physical assets (such as office premises, branches, customer self-service centres, data centres and other critical infrastructure) would be potentially impacted by extreme climate events.

3. *Climate risk heatmaps* – Synthesising the outputs of the above identification processes, the AIs developed climate risk heatmaps as an analytical tool showing clearly the potential impacts of physical and transition risks on them. In building the heatmaps, the AIs performed granular assessment grounded in both qualitative and quantitative analyses. The qualitative component focused on determining the likelihood of risk materialisation, taking into account such factors as observed policies, the AIs' business strategies and prevailing market conditions. The quantitative component consisted of impact assessment factoring in results of climate risk stress tests (CRST) and scenario analyses.

   The heatmaps provided useful insights from various angles including traditional inherent risks, time span (short-, medium- and long-term) and degree of impacts (high, medium or low). By incorporating these insights into the ICAAP and capital planning framework, the AIs were able to assess the outcomes of various strategic options, and make targeted risk mitigation and capital allocation decisions using a risk-based approach.

II. Assessment of capital adequacy and needs

Key observations

Many AIs have adopted a scorecard approach for the ICAAP to determine the additional capital that they need to hold to cater for risks not covered, or not adequately covered, under Pillar 1. Without creating a new scoring template specifically for climate-related risks, the AIs have augmented the pre-existing templates (e.g. those for systems and controls, credit and operational risks) with climate-related quantitative and qualitative factors for assessment.

AIs are required to incorporate relevant stress testing results into the ICAAP to ascertain that they have sufficient capital to withstand the impact of possible adverse events. In this connection, many AIs have considered the results of the HKMA's CRST in their ICAAP, while other AIs have developed stress scenarios tailored to their own risk profiles having regard to, amongst others, exposures to climate-related risks.

[1] Credit, market, operational, interest rate, liquidity, legal, strategic and reputation risks.

Good practices

AIs using climate risk heatmaps have enhanced the ICAAP framework accordingly to evaluate the impact of climate-related risks that might materialise within the capital planning horizon. The AIs assessed how such risks might interact with traditional risks, and related the results to capital adequacy under both normal and stressed conditions.

4. *Use of quantitative indicators* – A number of AIs have incorporated targeted and measurable climate-related quantitative indicators into their ICAAP. These indicators were not developed in isolation but were aligned with the metrics used in the AIs' climate risk appetite statement, ensuring consistency with their risk management framework and capital planning. Examples of quantitative indicators commonly adopted by these AIs include:

   - Credit risk:
     - Concentration of exposures to high-emitting sectors;
     - Percentage of property-related lending with collateral located in areas with significant physical risk;

   - Market risk:
     - Percentage of equity and debt securities in trading book classified as having high climate risks;

   - Operational risk:
     - Operational losses incurred due to extreme climate events over the past year;
     - Number of premises and own properties exposed to significant physical risk; and

   - Strategic risk:
     - Growth rate of ESG[2] loan or bond portfolios.

5. *Qualitative assessment* – In addition to quantitative indicators, these AIs have incorporated qualitative assessment of their climate risk governance and management framework into the ICAAP. A major area of such assessment was the governance structure underpinning the AIs' climate risk oversight, formulation of business strategies and approach to managing the risks. The clarity of roles, responsibilities and accountability across all levels of the institutions, including the board of directors, senior management, relevant risk committees and the three lines of defence was evaluated.

   Another focus of the assessment was risk monitoring mechanism, including the processes and tools used to identify and track climate-related risks. Particular attention was paid to whether the mechanism was capable of detecting emerging risks and providing timely information to senior management. Besides, the AIs evaluated whether their policies and frameworks for managing climate-related risks fulfilled the latest regulatory requirements and were in line with industry best

[2] Environmental, Social and Governance.

practices. This helped ensure their approaches were not only compliant but also forward-looking.

6. *Tailored CRST scenarios* – Integrating CRST into the ICAAP is essential for AIs assessing their resilience to climate-related challenges under stressed conditions. While many AIs have utilised common CRST scenarios developed by the HKMA, NGFS or other research organisations, some have demonstrated good practices by developing scenarios tailored to their own circumstances and unique risk profiles. These scenarios encompassed both macroeconomic and climate-related shocks that could occur within the AIs' capital planning horizon.

   For instance, one AI has assumed extreme climate events in its ICAAP stress scenario covering Hong Kong as well as regions where the AI had material business operations and risk exposures. This approach had considerable merits because the scenarios developed by the NGFS or regulators might not fully reflect the risks that the AI was exposed to in terms of geographies, business sectors and asset types. With the tailored scenario, the AI could more accurately assess the potential capital impact under adverse conditions. In addition, the AI has critically reviewed its risk profile in order to develop a suitable scenario. This process has helped the AI gain a deep understanding of its exposure to climate-related risks.

   Furthermore, the AIs using tailored ICAAP stress scenarios have demonstrated continuous improvement by conducting regular reviews and making enhancements to their CRST frameworks and methodologies. Recognising that CRST remains an evolving subject, these AIs have proactively modified the assumptions, data inputs, scenario design and modelling approaches to reflect the latest developments and insights, ensuring the ongoing robustness and relevance of the ICAAP and capital planning.

7. *Systematic assessment approach* – Most AIs have established a systematic approach to incorporating their climate-related risk assessment into the ICAAP and linking the ICAAP results to capital needs. They have developed clear policies and procedures to ensure a consistent and transparent process. For instance, amongst the AIs that have adopted a scorecard approach and introduced new climate-related risk factors in the assessment, many have taken steps to enhance and recalibrate their scoring systems accordingly. Specifically, clear criteria have been established for determining the score for each of the new factors, be it quantitative or qualitative. In addition, the mapping of scores to capital needs has been refined and set out clearly. The rationale and basis for adopting the criteria, score assignment and mapping to capital needs have been documented comprehensively, providing good audit trails to facilitate future reviews and potential enhancement. The AIs have also put in place procedures for periodic evaluation of the scoring systems and calibration to ensure their ongoing appropriateness.

III. Use of ICAAP results

Key observations

AIs' business strategies, ICAAP and capital planning are interlinked with each other.

Business strategies form part of the forward-looking input to the ICAAP, such that the assessment can capture all the relevant risks associated with the AIs' strategic direction. In turn, the ICAAP results provide useful information on the feasibility and sustainability of these strategies from the perspective of capital adequacy, thereby contributing to the formulation of capital plans and necessary modifications to the business strategies. While most AIs have made significant strides in incorporating climate-related risks in the ICAAP, a few have further translated the insights obtained from the process effectively into concrete action plans for deploying resources and capital to achieve their climate-related goals.

Good practices

8. *ICAAP-based business and capital strategies* – Good practices have been observed amongst the reviewed AIs which have made good use of climate-related risk assessment and stress testing results from the ICAAP to inform their business and capital plans. These AIs in general have established short-, medium- and long-term climate goals with corresponding strategies to achieve these goals, and have given due consideration to the ICAAP results and other information obtained from the process in developing these goals and strategies.

For instance, some AIs used information obtained from the ICAAP to identify sectors that could benefit from transition policies and adjusted their lending and investment strategies, as well as capital allocation and plans accordingly. Furthermore, some AIs have prioritised staff training, data collection and investment in technology tools to address gaps identified from the ICAAP, with a view to strengthening their climate risk management capabilities to support the business strategies.