



Monetary Authority of Singapore

# ICAAP – Internal Capital Adequacy Assessment Process

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# Three Pillars of Basel II

## Safe and Sound Banking System

### Pillar 1

#### *Minimum Capital Requirements*

- Calculation of capital requirements
  - Credit risk
  - Operational risk
  - Market risk

### Pillar 2

#### *Supervisory Review Process*

- Principles-based approach
- Covers all risks

### Pillar 3

#### *Market Discipline*

- Disclosure requirements
  - Capital structure
  - Risk exposures
  - Risk assessment processes

## **The ICAAP**

- Objectives and components
- The process
- Concept of EC and its use in ICAAP

## **The SREP**

- Our approach and expectations
- The process

## Pillar 2 – Components

1. Internal Capital Adequacy Assessment Process (ICAAP).
2. Supervisory review of a bank's ICAAP and its capital adequacy (SREP)
3. Supervisory assessment of compliance with the minimum standards and disclosure requirements in Pillars 1 and 3.

# Objectives of ICAAP / SREP

## **Ensure banks have adequate capital to support all risks.**

- Risks covered under Pillar 1 – Banks should not rely on Pillar 1 numbers without determining whether the numbers are appropriate.
- Risks not covered under Pillar 1 – e.g. interest rate risk in the banking book (IRRBB), credit concentration risk, business and strategic risk, reputational risk, liquidity risk, residual risk.
- Factors external to the bank – e.g. economic cycle effects.

## **Ensure banks have adequate capital to withstand stress.**

- Stress over a range of scenarios, under capital planning.

## **Encourage banks to develop and use better risk management techniques.**

- Use of economic capital (EC) approaches has been spurred on, in part, by Pillar 2. EC is one way of assessing/ measuring capital needs.

# Internal Capital Adequacy Assessment Process

**ICAAP is a bank's internal process for assessing its overall capital adequacy in relation to its risk profile and strategy for maintaining their capital levels.**

- ICAAP should be proportional to the size and complexity of the bank – risk and capital management must match risk taking.
- ICAAP must be bank-specific and bank-driven – not something that can be bought off-the-shelf, not something that should be designed for compliance purposes.
- Large capital buffers is not an excuse for not having a good ICAAP.

# Internal Capital Adequacy Assessment Process

**ICAAP is bank-specific, but there are key features we want to see in every ICAAP.**

- Adequate board and senior management oversight.
- Sound and comprehensive capital assessment:
  - Policies and procedures to ensure that the bank identifies, measures and reports all material risks (*not just Pillar 1-type of risks*).
  - Process that states capital adequacy goals with respect to risk, taking into account the bank's strategic focus and business plan.
  - Process of internal controls, reviews and audits to ensure the integrity of the ICAAP.
  - Use of stress testing to assess capital adequacy in a severe downturn.
- Forward-looking, taking into account the particular stage of the business cycle in which the bank is operating.
- ICAAP needs to be actionable. Internal use as a signal of credibility.

# ICAAP Process – Three Key Steps

ICAAP goes beyond capital accounting to capital management.

## Organisational Structure and Governance

- Ownership, Clear lines of responsibilities, Sufficient expert resources dedicated, Internal controls

### Risk Identification & Measurement

- Identify key current and emerging risks
- Quantify risks
  - Level of sophistication is tailored to size and complexity of risks
- Aggregation of capitalised risks
- Understand differences between internal capital and regulatory capital

### Projection & Tolerance Setting

- Projection and stress testing: comprehensive suite of stresses and scenarios
- Specification of risk appetite (i.e. the amount of risk a bank is able and willing to accept) with respect to biz plan
- Main stakeholder expectations
  - Capital and earnings implications

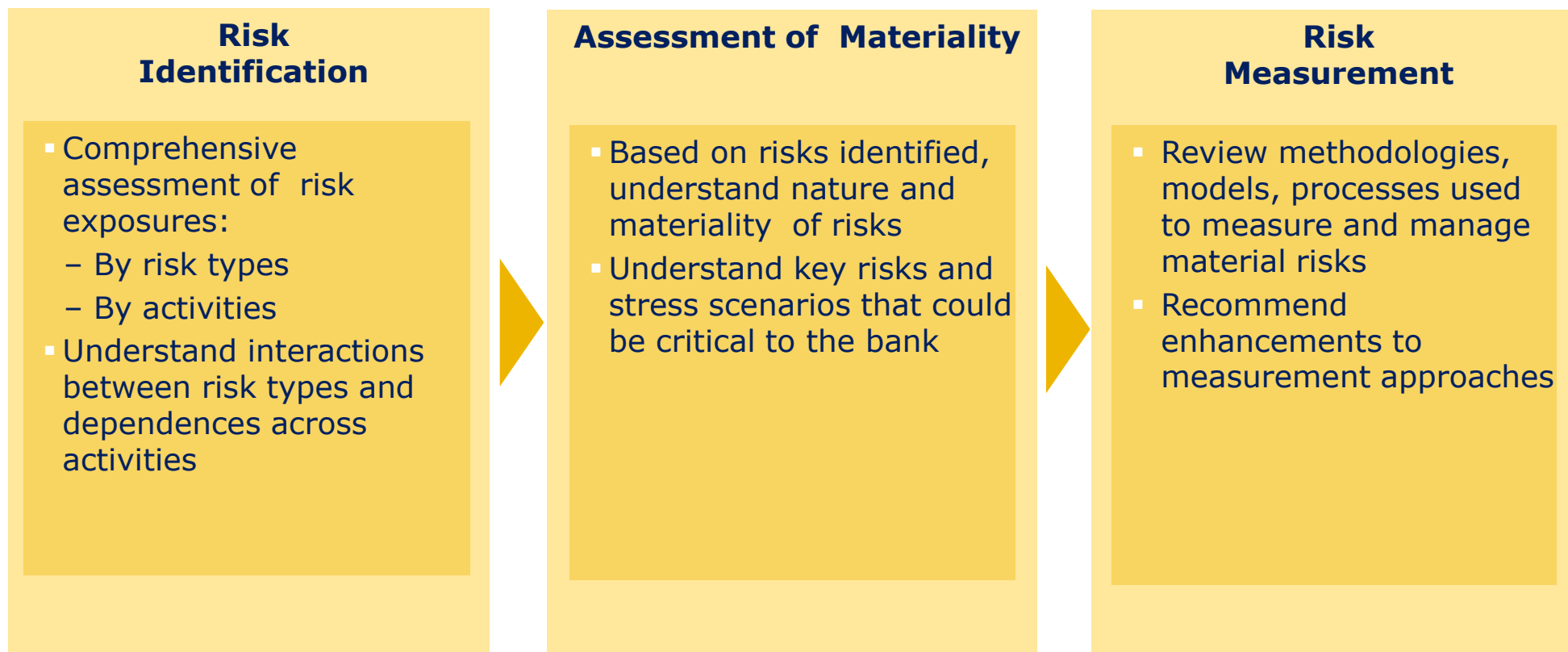
### Management & Communication

- Develop capital plan with respect to risk, taking into account the bank's strategic focus and biz plan
- Regular monitoring and reporting
- Management actions
- Communication

## Supporting Infrastructure (Data & IT)

# ICAAP Process – Risk Assessment

Comprehensive identification, assessment & measurement of all material risks



# ICAAP Process – Projection (incl. Stress Testing)

## Risk Identification

- Identify potential risk sensitivities and vulnerabilities based on the bank's risk exposures:
  - By risk types
  - By activities
- Understand interactions between risk types and dependencies between activities.

## Scenario Development

- Develop, select and prioritise relevant risk scenarios for testing and reporting based on identified risk sensitivities, vulnerabilities and cross-risk/ activity linkages
- Reverse stress test scenarios (that will lead to business failures) to help uncover hidden vulnerabilities

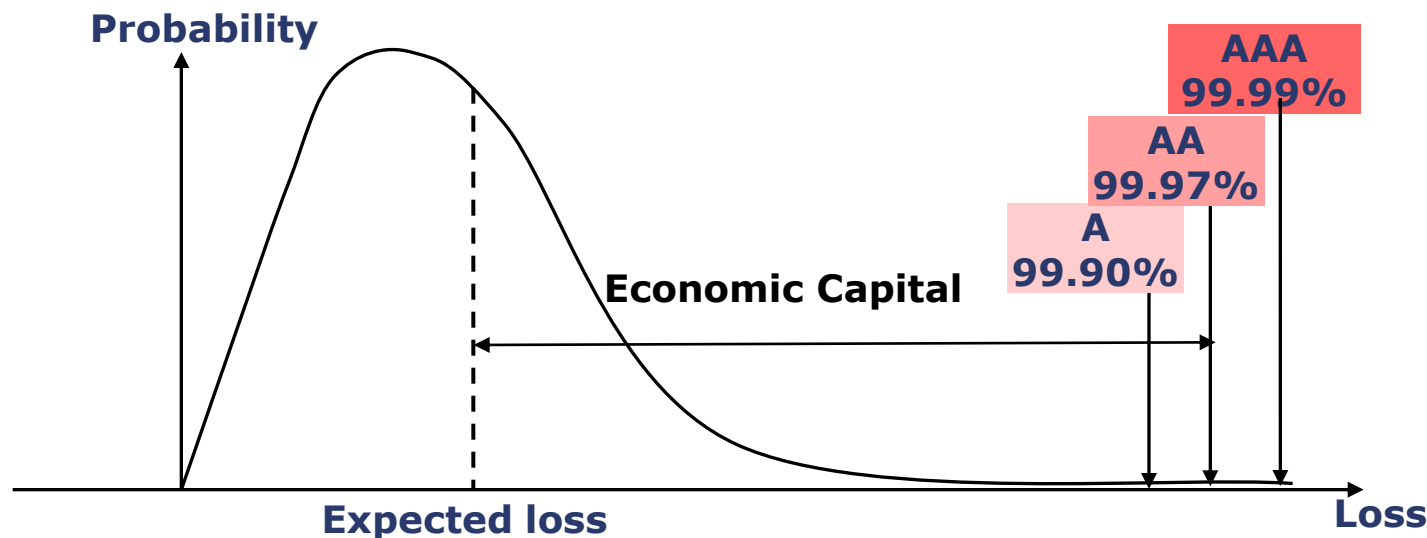
## Risk Quantification

- Review the likelihood and severity of the scenarios
- Classify and align the risks with risk appetite (i.e. the risk the bank is able and willing to take) and business strategy
- Benchmark potential losses against capital adequacy

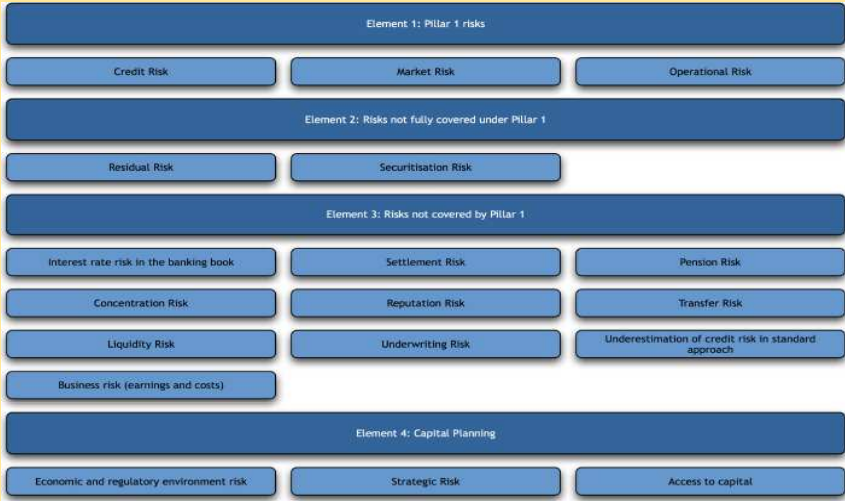
# What are the major banks doing?

- “There is a clear consensus that economic capital frameworks will be a key part of banks’ solutions for Pillar 2.”
  - Survey of Chief Risk Officers (2007).
- EC provides an internal measurement of the amount of capital that the bank will require under a range of scenarios and assumption.
- EC (also known as “risk capital”) is the capital required to absorb potential unexpected losses over a given time period, at a desired confidence level.
  - The confidence level is driven by the bank’s target solvency standard (defined typically in terms of the bank’s target debt rating).

## LOSS DISTRIBUTION (Asymmetric)



- Risks typically covered by EC frameworks include credit, market, operational, and business risks. Other risk types that are sometimes included are insurance, fixed asset, pension, private equity risks.

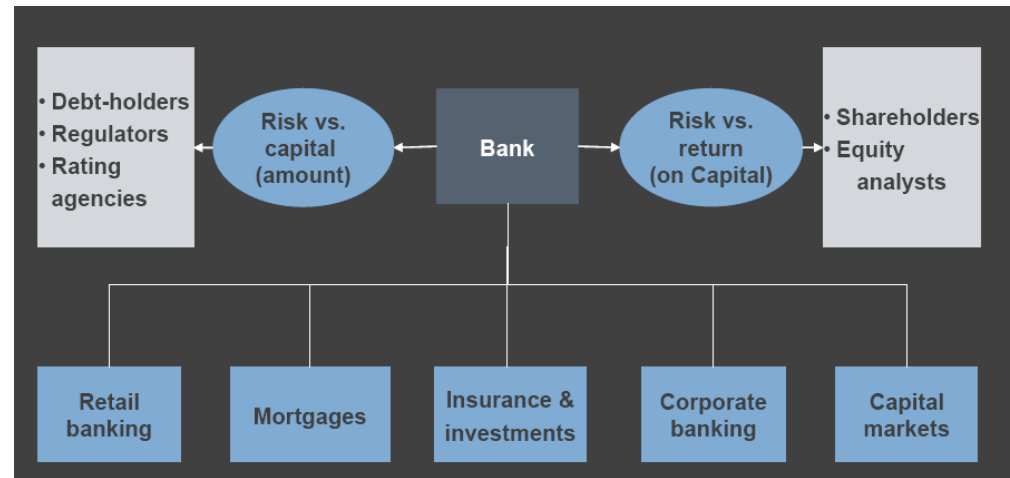


- EC is calculated risk type by risk type, and can be aggregated into a group loss curve. Methodologies will differ with the risk type and portfolio type.

- **EC allows FIs to quantify the capital required to cover material risks (e.g. credit, market, operational) and facilitates the evaluation of risk-adjusted returns.**
  - Better insight into balancing risk and return and allowing the FI to optimise results within acceptable risk constraints.
- **Objectives of an EC framework can be:**
  - Provide consistent assessment of investment strategies.
  - Provide insight into operational decisions such as pricing, performance evaluation, and capital allocation.
  - Provide clarity on which ventures create most value.
  - Gauge risk appetite.
  - Ensure adequate capital is held to cover severe events.
- **Leading global banks began development of EC frameworks before Basel II.**

# Economic Capital (Illustration)

EC can serve as a common denominator to link (sometimes divergent) interests of an institution's main stakeholders



RAROC <sup>1</sup>		Economic profit (EP)	
Net interest income	<input type="text"/>	Net interest income	<input type="text"/>
+ Non-interest income	<input type="text"/>	+ Non-interest income	<input type="text"/>
- Expected loss	<input type="text"/>	- Expected loss	<input type="text"/>
- Operating expenses	<input type="text"/>	- Operating expenses	<input type="text"/>
+ Equity credit	<input type="text"/>	+ Equity credit	<input type="text"/>
<hr/> Risk-adjusted profit	<input type="text"/>	<hr/> Risk-adjusted profit	<input type="text"/>
÷ Economic Capital	<input type="text"/>	- EC <sup>2</sup> x Hurdle rate	<input type="text"/>
<hr/> RAROC (%)	<input type="text"/>	<hr/> Economic profit (\$)	<input type="text"/>

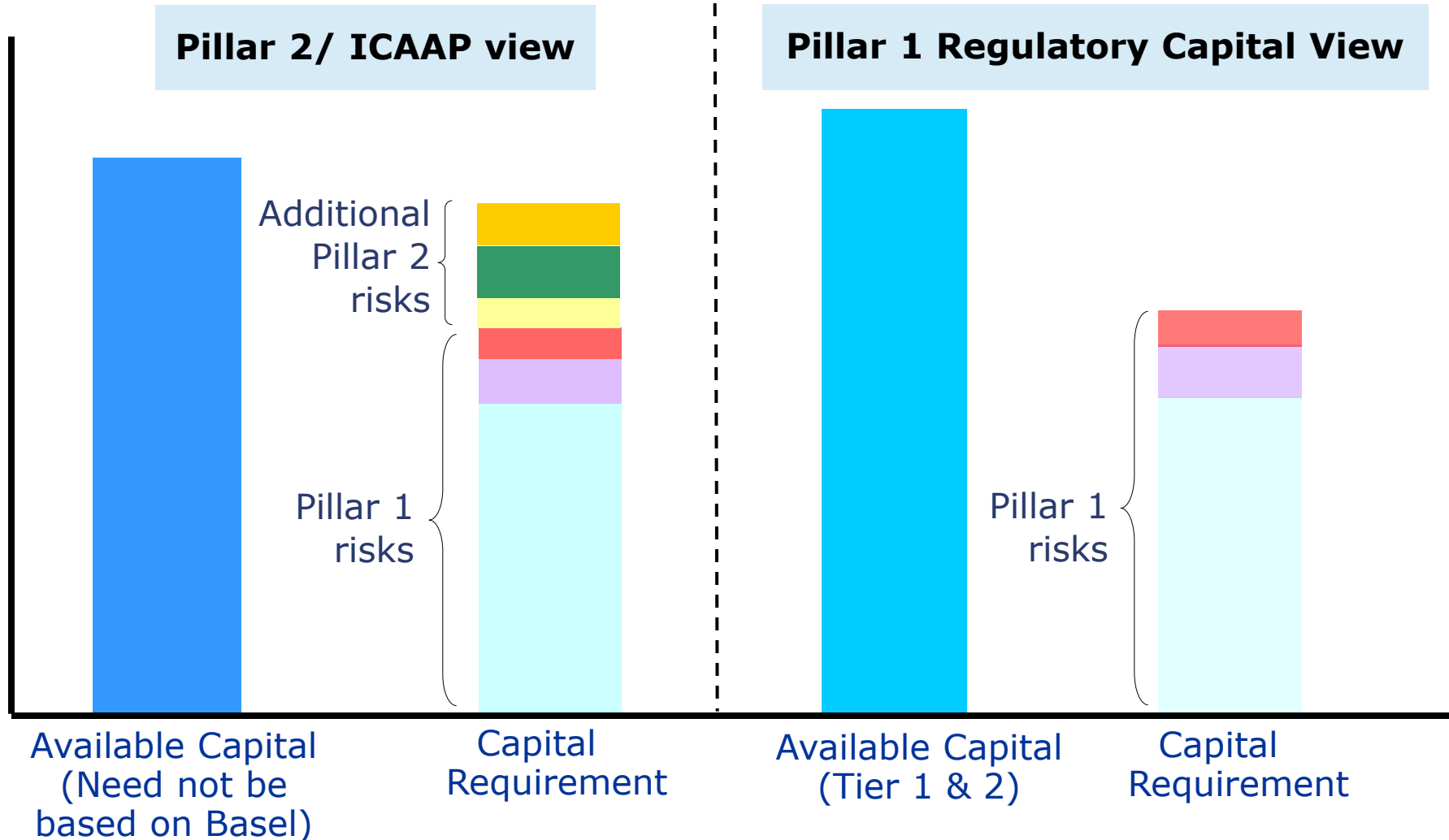
*Expected Loss substitutes for actual loss or provision*  
*Economic Capital Attributed in proportion to risk*  
*Hurdle Rate Minimum required return on equity capital*

<sup>1</sup>Risk-adjusted return on capital  
<sup>2</sup>EC = Economic Capital

Illustration: Using EC to measure business performance on a consistent basis

# Regulatory Capital vs Internal Capital (include EC)

Provides a comprehensive internal view of capital adequacy given a bank's risk profile



## How is EC used in ICAAP?

- **Adoption of an EC framework/ model should be primarily driven by business demand and used by the bank in its risk management.**
- **Various approaches might be taken to derive an internal capital assessment.**
  - Pillar 1 + add on approach (e.g. based on stress tests/ scenario analysis/ peer benchmarking)
  - EC to replace some P1 risks, Basel II RWAs for others plus add-on for P2 risks
  - EC models for most risks with subjective add-ons
  - Pure EC for all risks

# Can EC models and high CARs replace ICAAP?

- **Adopting EC is consistent with Pillar 2 ICAAP**
- **However, ICAAP is more than just EC**
  - EC framework is one aspect or approach towards assessing and measuring material risks.
  - EC provides an input to bank management making an educated comprehensive judgment about risk and capital.
- **Banks still need to address the following under the ICAAP, e.g.**
  - What is the bank's risk appetite?
  - What sort of risks and how should risks that are hard to quantify be considered or incorporated under ICAAP?
  - How does a static EC view link into a multi-year forward looking capital plan?
  - How should stress testing be incorporated into capital adequacy assessment?
  - What are the internal risk controls and governance structure?
  - What are the management actions?



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# SREP – Supervisory Review and Evaluation Process

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# Supervisory Review of ICAAP and Capital Adequacy

**Singapore adopts a proportional approach.** Examples from BCBS guidance:

- Assessment of capital relative to risks and supervisors may accordingly focus supervisory attention more intensely on banks with risk profiles or operational experience that warrants such attention.
- Detail and sophistication of a bank's risk management programmes should commensurate with the size and complexity of its business and overall level of risk the bank accepts. The Pillar 2 supplemental guidance should be applied to banks on a proportionate basis.

## **Singapore's Approach**

- Group-level/ Bank-level ICAAP for the 3 local banking groups.
  - Subsidiaries may rely on the group ICAAP where they are majority-owned and managed centrally within the parent bank. Significant risks posed by these subsidiaries should be evaluated within the group ICAAP.
- For foreign subsidiaries operating in Singapore, the approach will depend on the risk and complexity of the operations here.
  - A foreign subsidiary can rely on its head office's approach for ICAAP if it demonstrates the applicability to Singapore context. It must also have its own capital plan and conduct stress testing.

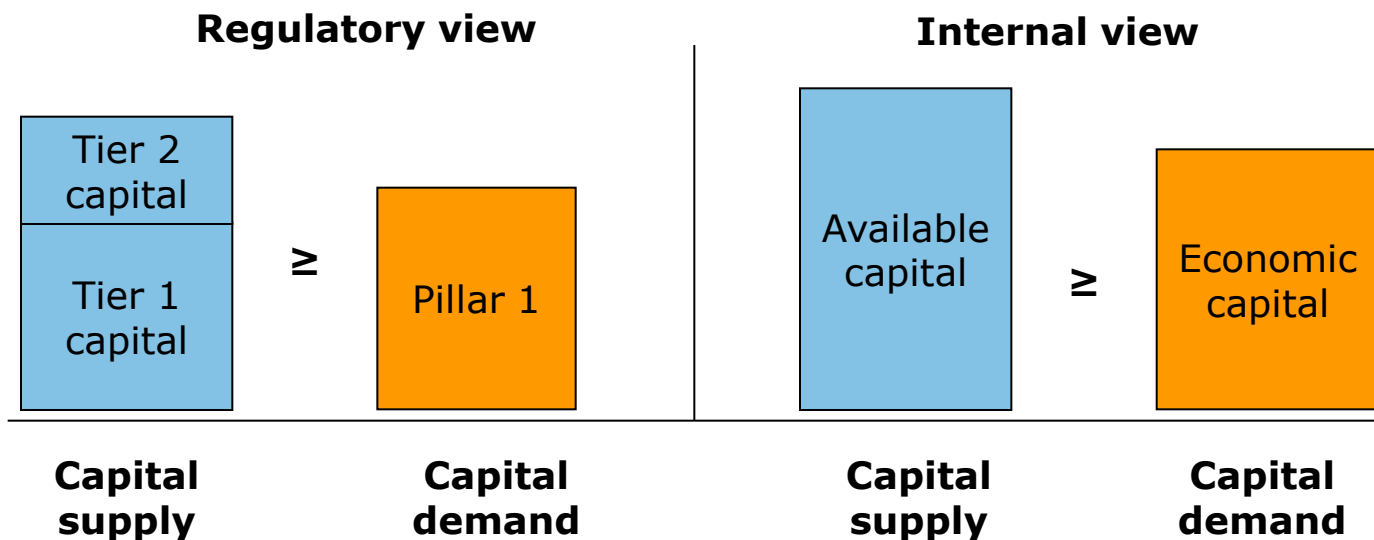
# Supervisory Review of ICAAP and Capital Adequacy

## **We review and evaluate a bank's internal capital adequacy assessment and strategies.**

- Critically evaluate and challenge the bank's approaches to ensure that a sound bank-wide risk management framework is in place to define its risk appetite and recognise all material risks.
- Evaluate the sufficiency of bank's internal assessment of capital adequacy and to intervene, where appropriate.
- Review methodologies and critical assumptions – small errors in methodology or assumptions can lead to significant reductions in capital requirements.
  - Some risk areas will involve quantitative techniques. Results from the models can provide an indication of what a reasonable amount of capital should be.
  - Other areas may be more qualitative in approach, with a more subjective link between risk and capital.
- Comprehensively assess that rigorous and forward-looking stress tests are conducted and are part of ICAAP.

# SREP: Capital Planning

- Consideration of various perspectives; toggling necessary
  - Internal (creditors and shareholders)
  - Regulatory
  - Others (e.g. rating agencies, market)
- Definition of capital supply and capital demand may differ across perspectives



- **Key expectations of a Reporting Bank under the capital planning element:**
  - Forecast its future performance based on its business plan
  - Subject the capital plan to stress tests
  - Assess the financial impact on its capital plan and the level of required capital before and after management actions
  - Assess the credibility of management actions
  - Identify how future capital needs (as required under the above stress tests) will be funded
  
- **Capital planning** element is to make the ICAAP a **forward-looking process**, capable of enabling a bank to make timely responses to changes in risk profile and external environment. **Stress testing** is a crucial component (“Pillar 2 capital stress test”).

- **Objective of supervisors' assessment**
  - To assess a bank's capital planning framework and evaluate if it is able to meet minimum capital requirements as an "on-going" concern at all times in a forward-looking manner, including throughout periods of stress
  
- **Capital Planning: Structure of Assessment**
  - Part I: Assessment of capital planning and stress testing frameworks
    - Q: Does the bank have a robust capital planning and stress testing frameworks?
  - Part II: Assessment of capital plan and stress tests
    - Q: What is the strength of a bank's capital plan?

# Our Process: Capital Planning

## Part I: Assessment of process

### Capital planning framework

Capital planning structure

Capital planning process

### Stress testing framework

Proportionality

Interpretation

Role of senior management

IT systems and resources

Calibration

Documentation and review

Communication

## Part II: Assessment of capital plan

### Capital plan and Pillar 2 capital stress test

Robustness of capital plan

Quality and composition of capital

Pillar 2 capital stress tests (elements as above)

Overall supervisory assessment of the bank

Capital planning framework

Capital planning structure

Capital planning process

Other Elements

Stress Testing framework

## Capital planning structure

- Governance structure
  - Assess if roles and responsibilities of parties involved are clearly-defined
  - Assess effectiveness of
    - Board and senior management oversight
    - Functional unit responsible for capital planning
    - Coordination between different functions throughout the bank
    - Communication channels, particularly to Board and senior management

Capital planning framework

Capital planning structure

Capital planning process

Other Elements

Stress Testing framework

## Capital planning process

- Setting of risk appetite
  - Assess coherence and effectiveness of risk appetite in communicating the bank's risk tolerance
- Setting of capital targets
  - Review and understand the capital targets
  - Review the rationale for chosen capital targets
  - Assess if capital targets are aligned with risk appetite
- Capital forecasting
  - Assess if the capital plan is sufficiently forward looking, i.e.
    - based on appropriate time horizon
    - reflects current and future capital demand and supply
    - based on forward-looking business and strategic plans
  - Assess the robustness of the capital forecasting process

Capital planning framework

Capital planning structure

Capital planning process

Other Elements

Stress Testing framework

## Other elements

- Monitoring
  - Assess bank has process in place for ongoing monitoring of capital usage against capital supply
- Definition of capital supply
  - Review the bank's internal definition
- Definition of capital demand
  - Review the bank's internal definition
- Documentation and review
  - Assess that there is proper documentation and review of the framework
- Independent review
  - Assess if there is a review of the robustness of the capital planning framework by an independent party

# SREP: Assessment of the Capital Plan

Capital plan and Pillar 2 capital stress test

Base case scenario

Pillar 2 capital stress tests

Robustness of capital plan

## Base case capital plan

- Assess the robustness of the base case capital plan

## *Pillar 2 Capital Stress Test scenario*

### Calibration and approach

- Assess if the scenario chosen is appropriate and sufficiently severe (i.e. one reflecting a severe economic downturn)
- Assess the robustness of the methodologies used to link the scenario to risk drivers, in order to derive the impact on capital demand and supply

### Scope and coverage

- Assess if the scope and coverage of the stress test is appropriate
  - Material risks
  - Business units
  - Portfolios and exposures
  - Both regulatory and internal view of capital

# SREP: Assessment of the Capital Plan

Capital plan and Pillar 2 capital stress test

Base case scenario

Pillar 2 capital stress tests

Robustness of capital plan

## Time horizon

- Assess if the time horizon of the stress test appropriate

## Management actions

- Assess if management actions have been considered and factored following the Pillar 2 Capital Stress Test results
- Assess if the proposed management actions are appropriate and credible

## Robustness of capital plan

- Assess if the capital plan is sufficiently robust

## Reverse Stress Test

- Review any reverse stress test by the bank.
- Review any measures to prevent or mitigate the vulnerabilities identified.

**ICAAP is a bank-driven process**

**Thank you**