

Managing Capital Adequacy with the Internal Capital Adequacy Assessment Process (ICAAP) - Challenges and Best Practices

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OVERVIEW

In addition to providing guidelines for calculation of minimum capital requirement and defining market disclosure requirements, one of the major objectives of the Basel II Accord is to improve risk management within the banks. As a result of Basel II, banks are faced with the task of developing internal procedures and systems in order to ensure that they possess adequate capital resources in the long term taking in to consideration all material risks. These procedures and systems are collectively known as ICAAP (Internal Capital Adequacy Assessment Process).

ICAAP is applicable to all banks irrespective of their size and complexity and its implementation is one of the major challenges being faced by banks.

BASEL II AND ICAAP

“International Convergence of Capital Measurement and Capital Standards-A Revised Framework”, (popularly known as Basel II), was issued by the Basel Committee of Banking Supervision (BCBS) in June, 2004. The revised framework aims for significantly more risk-sensitive capital requirements than the 1988 Basel I accord and is based on three mutually-reinforcing pillars - minimum capital requirements, supervisory review and market discipline.

Pillar 1 covers minimum capital requirements for credit, market and operational risk. Pillar 2 (Supervisory Review) comprises of Internal Capital Adequacy Assessment Process (ICAAP) followed by Supervisory Review and Evaluation Process (SREP) of the same. Pillar 3 (Market Discipline) includes disclosure requirements or reporting. Thus, ICAAP is covered under the Pillar 2 of Basel II Accord and is followed by SREP.

ICAAP is a firm’s internal assessment of capital that it considers adequate to cover all material risks to which it is exposed.

The objective of ICAAP is to ensure that a bank understands its risk profile and has systems in place to assess, quantify and monitor risk. One of the objectives is to determine the economic capital required to cover all risks faced. While Regulatory Capital is the capital that the regulator requires a bank to maintain, Economic capital is the capital that a bank needs to maintain and is, in general, estimated using internal risk models.

If we were to define the amount of risk as the possible loss in asset value over a time horizon or equivalently the erosion in the value of a bank’s equity (till the asset value falls below debt after which the debt holders start getting affected), then the amount of capital a bank needs to hold exactly equals the amount of risk. Therefore the term “Economic Capital” is frequently used as a proxy for Risk. Since theoretically a bank could suffer losses causing a complete erosion of its asset value, it is reasonable to look at the erosion which would almost never happen i.e. we need to consider losses so big that there is a very high probability that they will never occur and then see what would be the erosion in equity in that scenario(s). This forms the basis of Economic Capital measurement.

ICAAP is parallel to the regulatory capital requirements under Pillar 1 which is determined as per the specific guidelines. Further, the scope and coverage of ICAAP is much beyond the Pillar 1 in the sense that it not only covers the Pillar 1 risks (credit risk, market risk & operational risk) but also encompasses all the other risks (e.g. Concentration Risk, Liquidity Risk, Interest Rate Risk in Banking Book etc.). Though Pillar 1 is more costly and time-consuming to implement, Pillar 2 has more depth and far reaching consequences for the banks.

The guiding principles of ICAAP are summarized below:-

Principle of Proportionality: This principle determines the specific design of ICAAP within a bank and states that this design be proportionate to the risk level, complexity and scale of bank's activities.

Forward Looking: ICAAP must consider not only the existing risks faced but also the potential risks and future business strategies. For instance, if the bank faces an insignificant market risk due to small size of trading book and accordingly employs simplified methods for market risk assessment, then the insignificant market risk or small size of the trading book should reflect in the future business strategies with regard to trading book.

Ongoing exercise: ICAAP is not a static one-time process but rather a dynamic and continuous exercise to ensure that a bank has robust risk management systems and possesses sufficient internal capital at all times for risks.

Evolving-nature: ICAAP is continuously monitored for its efficacy and need for improvement given the changes in the risk profile and business plans of the bank. An organization may use simpler methods for some risks now but may have to switch to advanced techniques in future due to changes in the risk levels.

KEY FEATURES OF ICAAP:

ICAAP lies at the core of the four key principles of the Supervisory Review identified by the Basel Committee. Basel II has delineated five main features of ICAAP discussed briefly as below:-

Senior Management Oversight:

Basel II has entrusted bank's Board of Directors and senior management with the responsibility of putting in place an ICAAP appropriate to its risk profile and the business plan and analysis of bank's current and future capital needs.

Sound Capital Assessment

Sound Capital Assessment requires ICAAP design to be comprehensive and provide for identification, quantification and reporting of all the material risks faced by the bank. The bank should establish internal capital adequacy goals and have a process for internal control, review and audits.

Comprehensive Capital Assessment

ICAAP must address all the material risks faced by the bank. ICAAP extends beyond the Pillar 1 as it covers risks captured in Pillar 1 (i.e. Credit Risk, Market Risk and Operational Risk), risks not captured fully in pillar 1 (e.g. Residual Risk) and the risks not captured at all in pillar 1 (E.g. Concentration Risk, Business Risk etc.). Generally, ICAAP may involve some or all of the following risks:-

Credit Risk including

- Credit Risk
- Counterparty Credit Risk
- Concentration Risk
- Equity Risk in Banking Book
- Securitization Risk
- Country & Transfer Risk
- Residual risk arising from CRM techniques

Market Risk

- Interest Rate Risk
- Equity Risk
- Commodities Risk
- Foreign Exchange Risk

Operational Risk

Interest Rate Risk in Banking Book

Liquidity Risk

Other Risks

- Strategic Risk
- Reputation Risk
- Business Risk
- Pension Obligation Risk
- Any other risk identified.

Monitoring and reporting

This involves establishing a formal monitoring and reporting mechanism which provides the senior management with the necessary information on the risk profile, trends & the capital requirements.

Internal Control Review

This involves putting in place an appropriate mechanism of internal and external audits for ensuring the reasonableness of ICAAP and the accuracy of the data and stress scenarios used.

ICAAP COMPONENTS

The major components of ICAAP of a bank can be illustrated through the following diagram:-

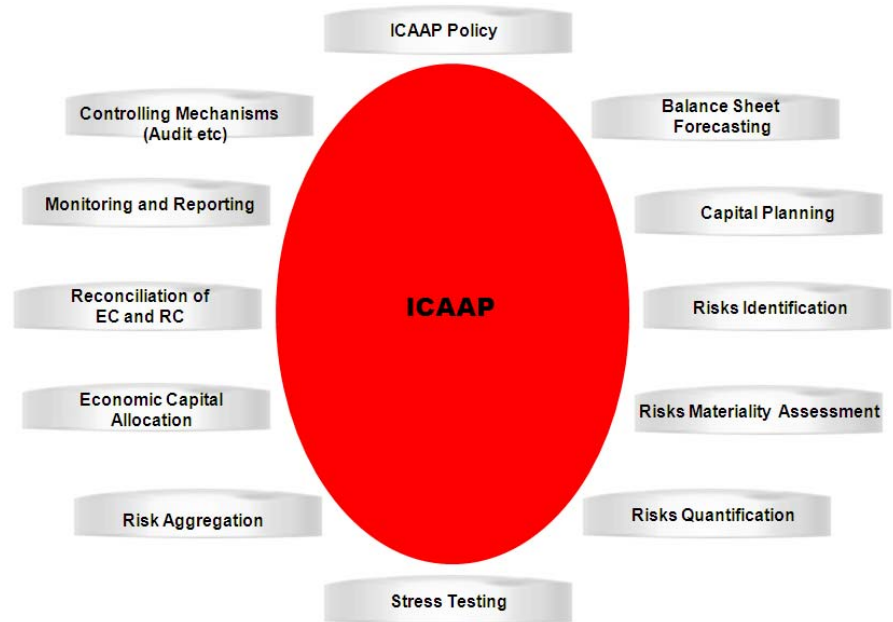


Figure: Components of Internal Capital Adequacy Assessment Process (ICAAP)

ICAAP CHALLENGES AND SOLUTIONS

The various challenges in ICAAP and the approaches to addressing them are:

Risk Identification

ICAAP requires a bank to identify all the risks that it faces. Bank for International Settlements (BIS) has not given a comprehensive list of all risks that need to be addressed under ICAAP. It is the bank’s responsibility to identify all the material risks faced by the bank. E.g. Pension Risk may be relevant for some and may not be so for others. Risk identification requires a thorough analysis of the bank’s activities, its business units, regulatory and market environment, historical scenarios, etc.

Bank should put in place an automated process for identification of risks at the pre-determined frequency. Risks are identified for entity and/ or line of business and/ or geography and/ or product and/ or process and/ or resources. Risk-identification can be carried out using either a top-down approach (known as

Library Approach) or bottom-up approach (known as Questionnaire Approach) or a combination of both.

To address this problem, a bank can design a plan of action and execute it using its current frameworks and systems. Alternatively, banks can opt for solutions which are available in the market to manage this process in an automated and efficient manner. These solutions are designed to capture information at the desired levels, process the same and present the analysis to the senior management to monitor the risk on on-going basis.

Materiality assessment of risks

The categorization of each identified risk to the various materiality levels (e.g. Immaterial, Low, Medium, High, and Very High) is a challenging task as this requires identifying the criteria (Key Risk Identifier) and assessing across multiple such criteria E.g. Credit risk materiality can be assessed using a combination of factors such as size, complexity of instruments, ratings, collateralization, Etc.

Vendor solutions, which are able to compute and provide out-of-the-box reports on multiple evaluating criteria for determining the materiality of identified risks, can solve the problem in this regard. E.g. Materiality for concentration risk can be assessed based on solution provided reports on Lorenz Curve, Gini Coefficient, Concentration Rate, Concentration Curve, Rosenbluth Index, Herfindahl Index (HHI), profiles of distribution across various sectors and regions etc.

Risk quantification

One of the key challenges banks face is in the quantification of risks. Models need to be appropriate for the bank based on the materiality of identified risks. External economic capital solutions provide best-in-industry methods for quantification of multiple risks and are tested for successful implementation and regulatory acceptance in jurisdictions. Further since credit, market and operational risk comprise the most material risks; banks should focus on sophisticated modeling solutions for the assessment of these risks. These have the added benefit of recovering the cost of implementing the models from their business benefits at a relatively early stage.

Currently there are no established industry standard models for liquidity risk, reputation risk, and strategic risk. Many banks practice keeping a arbitrary capital cushion for these risks. However this is a rudimentary method and lacks risk sensitivity. This is like keeping a capital cushion of “x” for a risk which is not quantified. There are few approaches available for their quantification too which are discussed below.

The following matrix illustrates the summary on the various risks, their materiality and the methodology employed for their quantification.

Bank's Risk Identification, Materiality and Assessment Methodology - An Example

Risk Category	Risk Sub-Category	Risk Materiality	Justification (if immaterial)	Risk assessment methodology used
Credit Risk	Credit Risk	Very High		Internal EC Model
	Counterparty Credit Risk	High		Internal Model
	Equity Risk in Banking Book	Immaterial	Equity Assets as share of total assets < 1%	Simple Risk Weight Approach
	Country / Transfer Risk	Medium		Strict Limitation (Structural Limit)
	Securitisation Risk	Immaterial	No involvement in securitisation as originator or investor	Not considered
	Concentration Risk	High		Factored in to EC Model
	Residual Risk from CRM	Medium		Factored in to EC Model
Market Risk	Interest Rate Risk	Low		Standard supervisory methods
	Equity Risk in Banking Book	High		VaR Model
	Commodities Risk	Immaterial	No dealing in commodities	Not considered
	Foreign Exchange Risk	Low		Shortcut Method
Operational Risk		Low		Basic Indicator Approach
Interest Rate Risk in Banking Book		High		VaR Model
Other Risks	Liquidity Risk	Low		Qualitative Measure
	Strategic Risk	Medium		Factored in to Business Risk
	Reputational Risk	Low		Factored in to Business Risk
	Pension Risk	Immaterial	Bank does not have pension liabilities	Not considered
	Business Risk	Medium		Earning-at-risk Modelling

Credit risk is the largest and most obvious source of risk for a bank. Economic capital models, in general, adopt a loss distribution based approach that estimates the credit VaR based on risk parameters such as default rate, probability of default (PD), loss given default (LGD) and exposure at default (EAD). These parameters in turn are estimated using industry standard models. For instance PD is estimated using either structural models like Merton's Model or reduced form models. These models need to be calibrated to historical time series data on default occurrence, recoveries, etc.

Market risk is the risk arising from the adverse movements in the underlying market factors such as interest rates, equity prices, commodity prices and exchange rates. VaR methodologies using either an analytic approach or a simulation approach are commonly adopted for estimation of market risk. The challenge in market risk calculation is to be able to keep pace with the speed at which new instruments are introduced.

A loss distribution approach (LDA) is the standard methodology for estimating economic capital for operational risk. The loss distribution is estimated by modeling frequency and severity of losses and simulating the resulting compound distribution. While frequency of losses is modeled using discrete distributions such as poisson, binomial and negative binomial distributions, severity of each loss is modeled using continuous distributions such as log-normal, generalized pareto,

weibull, etc. The appropriateness of a distribution is based on standard goodness-of-fit tests.

However the key challenge in modeling operational risk is lack of data. Addressing this requires use of external and scenario data in the modeling process which comes with its own challenges of scaling and merging it with internal loss data. This often results in underestimation of tail loss events. While simulating the compound loss distribution the correlation in occurrence of losses also needs to be factored. Correlation measures such as Pearson's coefficient are inappropriate for operational risk since they assume a normal distribution. Copulas allow for modeling the dependence structure of the frequency of operational risk losses while making no assumptions regarding the distribution of underlying variable. An operational risk economic capital model also needs to adjust the simulated losses to allow for the impact of insurance.

Interest Rate risk on the banking book is in general calculated by estimating the worst case scenario of the change in market value of equity (MVE). Market value of equity is defined as the present value of net future cash flows. Simulation of interest rates enables estimation of the distribution of potential changes in MVE.

Capital for liquidity risk may be calculated as the worst case scenario of change in liquidity gap over a given time horizon. This approach requires estimating the liquidity gap as a function of systematic factors. The systematic factors are in turn simulated using Monte Carlo methods to arrive at the potential distribution of liquidity gaps.

Economic capital for business risk can be determined through modeling the revenues, fixed costs and variable costs which are not related to credit or market risk or extra-ordinary gains/losses. The bank may choose historical accounting-based approach or Monte-Carlo Simulation approach to assess the economic capital for business risk.

Reputation risk capital assessment involves the identification of risk factors and design of the expected scenarios on the development of these factors. The analysis of these scenarios is used in estimating the effect on bank's operations and the economic capital for reputational risk. The reputation risk can also be estimated as decline in the bank's market value driven by the reputation risk incidents.

Reporting and monitoring process

Banks faces several challenges in implementing the reporting and monitoring processes, procedures and systems. These challenges include identifying the granularity level for each risk type, deciding on the appropriate monitoring procedures and systems for each risk, reporting templates, frequency of reporting.

A fully-automated reporting framework with specified generation schedule and pre-defined reports covering risk identification, assessment, quantification, aggregation and allocation holds the answer to the stringent reporting requirements of ICAAP.

Technologies, which are based on industry standards such as BPEL, can be used for definition of workflows which require multi-user processing. The workflow processes can be used in action planning, where tasks are assigned to users playing different roles and automated tracking of the actions taken.

An efficient monitoring process can be established through configuring automated alerts for various levels in the organization as and when the risk assessments of various risks reach respective thresholds (Lower bound, Alert, Critical, and Upper Bound).

A system containing built-in intelligence and linkage of risks, risk assessment, controls and control assessment across various combinations of entity, line of business, geography, product, process or resources will solve the need of a controlling mechanism for ICAAP. These controls need to be assessed for their design effectiveness and their operational effectiveness of ICAAP. Test plans to assess various controls need to be prepared and their results need to be tracked on on-going basis.

Reconciliation of ICAAP and Pillar One

Banks not only need to compute the economic capital for various risks under ICAAP but are also required to reconcile it with the regulatory capital requirements. This process requires computing, comparing and explaining the differences between the two. This is a challenging task for banks and involves thorough comparison of the bank's internal model(s) and assumptions vis-à-vis the regulatory model and its assumptions to enable the bank to attribute differences between the two to specific factors.

Vendor economic capital solutions that generate economic capital for credit, market and operational risk, available in the market support this challenging requirement of ICAAP. For example in an economic capital solution for credit risk which factors in to correlation between the risk factors, multiple risk factors and granularity, the reconciliation can be achieved through generating a report containing the output of economic capital baseline run, three economic capital runs with each assumption relaxed successively and the final column showing the regulatory capital. This will clearly illustrate as to how the economic capital approaches the regulatory capital when these assumptions are relaxed successively in the economic capital model.

Stress testing

ICAAP also requires a bank to develop an appropriate stress testing framework for assessing the risk under extreme but plausible scenarios of economic conditions. These stress scenarios may be based on movements seen historically at the time of crises or may be based on expert judgment. Stress testing must take in to account supervisory, historical, bank-specific and hypothetical scenarios. The lack of clarity on this issue, non-availability of data on historical scenarios, lack of expertise, etc, tend to make stress testing an uphill task for the bank.

Vendor solutions allow banks to define and store scenarios as part of a scenarios library. These scenarios can be used across various risk types. For instance the bank can create a comprehensive scenario detailing the impact of a mild recession and assess its impact across credit, market, liquidity and business risks using these solutions.

Resources

Establishment of ICAAP in a bank requires skilled human resources; and an appropriate information technology (IT) infrastructure which is able to provide timely and quality data for ICAAP. This is a significant challenge especially in the banks which do not have an existing sophisticated risk management system in place and in the developing countries where there is a general deficiency of trained resources having expertise in the design, documenting, and implementation and monitoring of ICAAP. Banks should seek out consulting firms or vendors who have rich experience, expertise and deep understanding of the various business and technological issues involved in ICAAP.

Banks can benefit from these vendors' conceptual and practical knowledge of the design, procedures, processes, reporting and control mechanisms of ICAAP.

REGULATORY GUIDANCE ON ICAAP

Apart from BIS, various other regulators have issued guidance on ICAAP. ICAAP guidelines issued by Financial Services Authority (FSA) of U.K., Committee of European Banking Supervisors (CEBS) based in London, U.K., Hong Kong Monetary Authority (HKMA) of Hong Kong, Oesterreichische Nationalbank (OeNB) of Austria need a special mention in this regard. While OeNB has provided the most detailed guidelines on ICAAP, FSA has also issued a suggested format for ICAAP submission to the FSA.

CONCLUSION

ICAAP is an opportunity for banks to improve the risk management culture and systems within the organization. ICAAP has not only the compliance consideration but business perspectives as well for all the stakeholders including lenders, shareholders, customers etc. since it ensures that the bank possesses sufficient internal capital for meeting various risks or in other words ensure the solvency and hence continuous survival of the bank. Recent crisis has also reinforced the importance of a robust ICAAP at the root of sound risk management programme. Further, ICAAP lies at the root of a bank's pursuit of performance analysis using measures like risk adjusted return on capital (RAROC), return on risk adjusted capital (RORAC), risk adjusted return on risk adjusted capital (RARORAC) and risk-based pricing of exposures.



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