IPPF
International Professional Practices Framework

# Auditing Capital Adequacy and Stress Testing for Banks

2nd Edition

Supplemental Guidance | **Practice Guide**

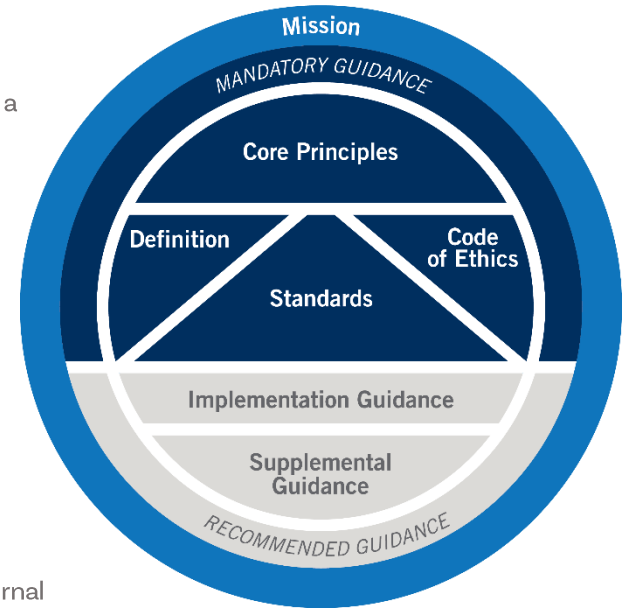
FINANCIAL SERVICES

The Institute of Internal Auditors

# About the IPPF

The International Professional Practices Framework® (IPPF®) is the conceptual framework that organizes authoritative guidance promulgated by The IIA for internal audit professionals worldwide.

IPPF | International Professional Practices Framework




**Mandatory Guidance** is developed following an established due diligence process, which includes a period of public exposure for stakeholder input. The mandatory elements of the IPPF are:

- Core Principles for the Professional Practice of Internal Auditing.
- Definition of Internal Auditing.
- Code of Ethics.
- International Standards for the Professional Practice of Internal Auditing.

**Recommended Guidance** includes Implementation and Supplemental Guidance. Implementation Guidance is designed to help internal auditors understand how to apply and conform with the requirements of Mandatory Guidance.

## About Supplemental Guidance

Supplemental Guidance provides additional information, advice, and best practices for providing internal audit services. It supports the *Standards* by addressing topical areas and sector-specific issues in more detail than Implementation Guidance and is endorsed by The IIA through formal review and approval processes.

### *Practice Guides*

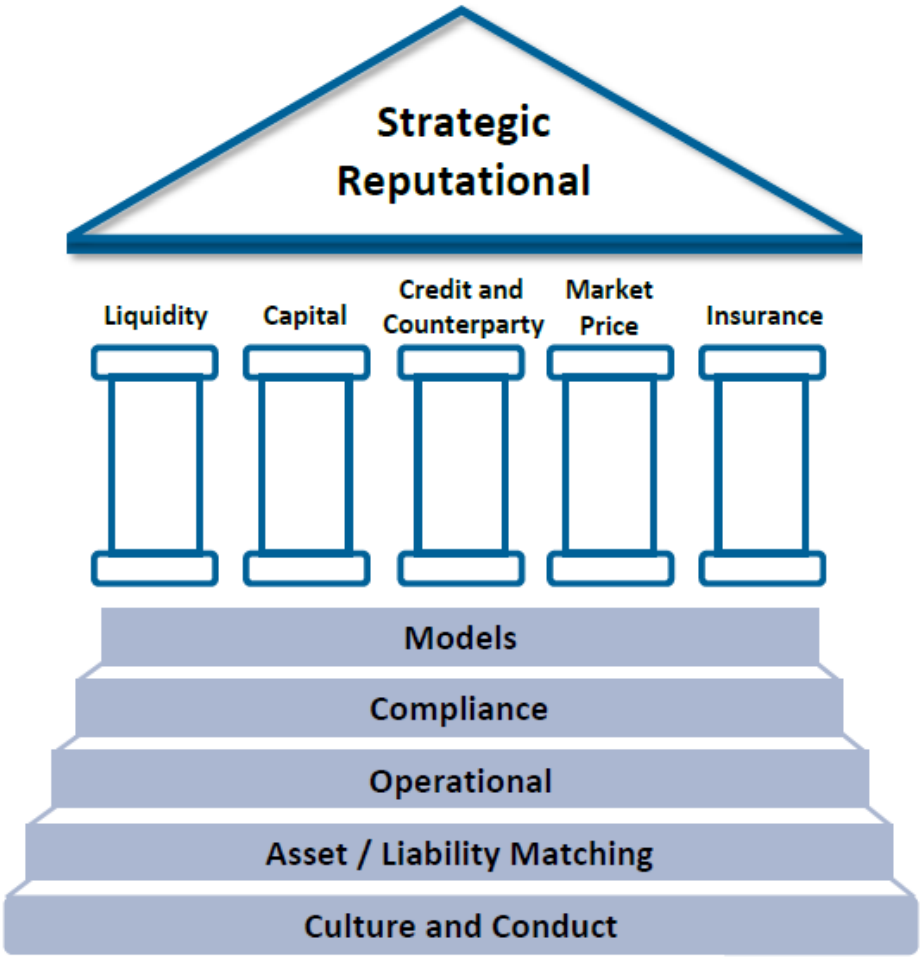
Practice Guides, a type of Supplemental Guidance, provide detailed approaches, step-by-step processes, and examples intended to support all internal auditors. Select Practice Guides focus on:

- Financial Services.
- Public Sector.
- Information Technology (GTAG®).

For an overview of authoritative guidance materials provided by The IIA, please visit www.theiia.org.

## The IIA's Financial Services Risk Framework

To properly manage the risks facing their organization, employees must understand the terminology associated with risk management. One tool to communicate risk information across organizations is a risk framework. The IIA's Financial Services Guidance Committee has developed a comprehensive risk framework specifically for financial services organizations. This risk framework considers the significant areas of risk applicable to the financial services industry globally.




Source: The Institute of Internal Auditors.

This practice guide focuses on the Capital Risk pillar, one of the five pillars representing significant execution risks faced by financial services firms. Capital risk may be defined as the failure to retain sufficient capital to run the business while still absorbing the risk and volatility of its credit, market, and operational threats.

# Contents

# Executive Summary

**For the economy to remain stable**, banking institutions,[1] especially those that are systematically important (or "too big to fail") must have sufficient capital to handle changes in business cycles. Capital adequacy means that an institution has sufficient capital to run its business while absorbing the volatility introduced by its credit, market, and operational risks. Internal auditors in the financial services sector must be qualified to understand, measure, and assess whether an institution's capital planning process (see **Figure 1**) adequately and effectively predicts the level of capital needed under current conditions, as well as under stressed financial and economic scenarios.

After the global financial crisis of 2007–2009, the Basel Committee on Banking Supervision (BCBS), the primary global standard setter for the prudential regulation of banks, issued a series of standards (Basel I, II, and III) establishing minimum capital requirements among banking institutions that operate internationally. The Basel standards were consolidated into the comprehensive Basel Framework, which includes policy recommendations, methodological tools, metrics, and reporting guidelines that banking supervisors use to review and evaluate banking institutions. Government legislators and regulators globally incorporated the Basel Framework into regulations for financial institutions. Thus, internal auditors working in the financial services industry may need to understand the international Basel standards and principles of capital adequacy. This guide explores internal audit's role in evaluating the capital planning and management process.

1. For this practice guide, the terms "banking institution," "financial institution," and "bank" are used interchangeably to refer to banks, bank holding companies, financial corporations, or other companies considered by banking supervisors to be the parent of a banking group under applicable national law as determined to be appropriate by the entity's national supervisor. The U.S. Federal Reserve uses the term "firm" in the same context.

# Introduction

## Overview of Capital Adequacy and Liquidity

Stability within the banking sector is crucial to preserve the trust that underpins a well-functioning economy. Global and regional financial crises of the past have demonstrated how weaknesses in the banking sector may have a pervasive detrimental effect on the larger financial market, especially in a world of interconnected **global systemically important banks (G-SIBs)**. For example, the global financial crisis of 2007–2009 drastically constricted liquidity and credit availability in the financial system. Failures in capital planning and management were among the prominent reasons for that crisis.

> **Note**
>
> Terms in bold are defined in the Glossary.

Banks measure **capital adequacy** as a ratio of their available **capital** to their risk exposure. Going into the crisis, banks underestimated the impact of credit, market, and operational risks and accumulated low-quality capital instruments that could not absorb losses. At the same time, market conditions caused once liquid investments to decline drastically in value and quality. The combination of these circumstances reduced banks' ability to borrow and lend, which drastically constricted liquidity and credit availability throughout the financial system.

Globally, regulators came together to create Basel standards, guidelines, and recommendations related to capital adequacy. The Basel Framework seeks to reduce the risk of economic meltdowns and enhance the banking sector's ability to deal with financial stress by strengthening the resilience of individual banks. It does so primarily by pushing the banks to improve their **risk management** processes and transparency practices. Assurance providers, including internal auditors, should understand the implications of the recommendations and the risks and controls related to capital adequacy.

## Practice Guide Objectives

This guide explains capital adequacy and how to plan and perform internal audit engagements to provide assurance on the capital planning process. After reading this guidance, internal auditors should be able to:

- Define the different types of capital.
- Understand the elements of the capital planning process and associated oversight activities, including **risk appetite** and risk management strategies.
- Understand strategies and methods to model credit, market, and operational risk.

- Understand **risk-weighted assets**, **risk-based capital**, **capital adequacy ratio**, and the **leverage ratio** for capital that is not risk-based.
- Evaluate how the capital processes support the bank's stated risk appetite.
- Understand the bank's processes for stress testing risk models, including how stress scenarios are developed.
- Understand the role of the internal audit activity in assessing the effectiveness of the bank's capital planning process.

This knowledge will allow internal auditors to assess how effectively management has designed and executed the processes required to maintain adequate capital for the bank.

## Overview of Capital

Generally, organizations define banking capital as the bank's net worth, that is, the difference between its assets and liabilities. Typical bank assets include cash, government securities, and loans provided by banks to their customers. Banks also have deposit accounts, loans from third parties, and other forms of debts, which together comprise liabilities. Primary funding sources for banking capital include stock offerings, prior net earnings, equity reserves, subordinated debentures, and minority interests. Banking capital enables a bank to absorb losses from credit, market, and operational risks.

This guide explores the following types of capital:

- *Economic capital* – The amount of risk capital that a bank, using its own risk models, estimates it needs to remain solvent while covering unexpected losses at a given confidence level and time horizon.
- *Regulatory capital* – The minimum amount of capital that regulators require banks to hold as a buffer to cover unexpected losses in proportion to risky assets held on their balance sheets. Regulatory capital under the Basel Framework focuses on high-quality capital, predominantly in shares and retained earnings that can fully absorb losses at the so-called point of nonviability before taxpayers are exposed to loss.

## Business Significance: Risks and Opportunities

Capital adequacy preserves the short- and long-term stability of financial corporations in managing the following risk exposures:

- *Credit risk* – "(T)he potential that a bank borrower, or counterparty will fail to meet its obligations in accordance with agreed terms."[2]
- *Liquidity risk* – "(T)he risk that the firm will not be able to meet efficiently both expected and unexpected current and future cash flow and collateral needs without affecting either daily operations or the financial condition of the firm."[3]

2. Basel Committee. Principles for the Management of Credit Risk.
3. Basel Committee. "Principles for Sound Liquidity."

- *Market risk* — "(T)he risk of losses in on- and off-balance sheet positions arising from movements in market prices."[4]
- *Operational risk* — "risk of loss resulting from inadequate or failed internal processes, people, and systems or from external events. This definition includes legal risk, but excludes strategic and reputational risk."[5]

These risk exposures may lead to outcomes including:

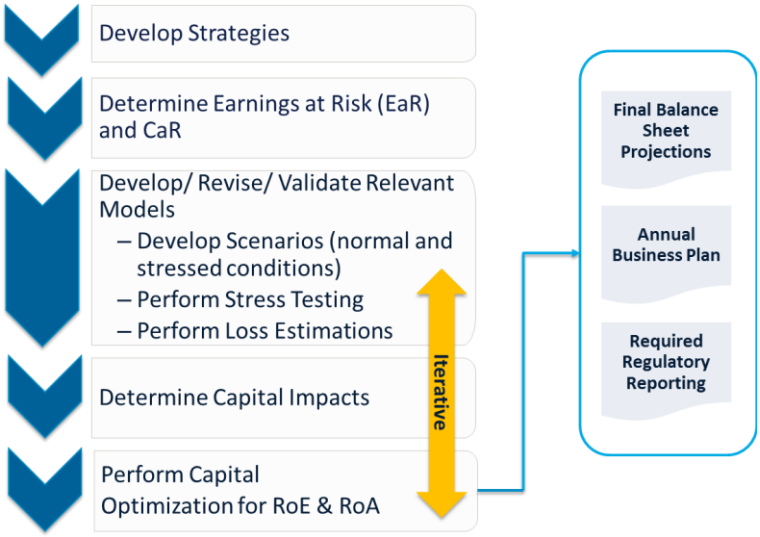
- Inability to expand the business.
- Inability to carry additional risk with available capital.
- Inability to distribute profits, such as dividends.
- Inability to meet financial obligations when they come due.
- A need to cease operations or receive assistance (such as bailouts) from the government.

4. Basel Committee. "MAR – Calculation of RWA."
5. U.S. Government Publishing Office, 12 CFR 225.8(e)(1)(iii).

# The Capital Planning Process

**Capital planning is key** to the safety and soundness of a financial institution, and an institution's board is ultimately responsible for strategic decisions, including capital adequacy. **Figure 1** outlines the essential elements of a capital planning process.

Figure 1: Capital Planning, Management, and Reporting




According to U.S. Federal Reserve Guidance, a bank's capital planning should be consistent with the strategy and risk appetite set by the board and with the bank's risk levels, including how risks may emerge and evolve under stress. The board must annually review and approve the bank's capital plan.[6]

## Develop Capital Strategy

A bank's business model, objectives, geography, markets, and regulatory requirements, among other factors, shape its strategies and decisions about the capital needed to manage risk and fulfill obligations and requirements. Regulatory capital requirements are conservative to protect institutions and their stakeholders in a crisis. A bank's capital strategy seeks to optimize the level of capital required to manage its risk exposures while generating returns. The capital planning process should enable the bank to achieve the dual objectives of complying with regulatory capital requirements and generating the financial results its stakeholders expect. Capital planning helps the bank allocate capital to the strategies, business lines, and products they plan to pursue

When evaluating capital adequacy risk, banks consider their risk appetite given their target capital position. The IPPF defines **risk appetite** as "the level of risk that an organization is willing to accept." A **risk appetite framework** is "the overall approach, including policies, processes, controls, and systems, through which risk appetite is established, communicated, and

6. Board of Governors of the Federal Reserve System. "Federal Reserve Supervisory Assessment."

monitored."[7] Senior management may use the risk appetite framework to articulate an overview of the organization's risk profile and define acceptable limits.

At least annually and whenever significant organizational or other changes occur, the board should review and approve the bank's risk appetite and risk appetite framework to ensure senior management effectively manages capital risks. The board should ensure that the bank has a risk management framework that enables the ongoing identification and management of risks consistent with the risk appetite. The board should ratify any policy changes.

### Assessment of the Capital Planning Process: Fundamental Elements

Internal auditors should integrate these fundamental elements into their internal audit plans:

- Policies and procedures designed to ensure that the bank identifies, measures, and reports all material risks.
- A process that relates capital to the level of risk.
- A process that states capital adequacy goals with respect to risk, taking into account the bank's strategic focus and business plan.
- A process of internal controls, reviews, and audits to ensure the appropriateness of the overall management process.

Source: Basel Committee. *International Convergence of Capital Measurements*

## Assessing and Managing Risk

Sound risk management is critical in the financial sector. The IIA's Three Lines Model clarifies roles and responsibilities related to risk management.[8] Internal auditors should confirm that the bank involves first line and second line functions in proposing plans and in challenging the strategy assumptions that inform the capital planning process. In many organizations, senior managers in first line roles assess risks and propose the level of risk mitigation (operationalized through targets and limits) appropriate to the organization's risk appetite. The second line's role depends on organizational maturity and other factors. Second line roles, such as the bank's risk management function, often face challenges in determining whether the risk assessment and planned risk mitigation activities are comprehensive, appropriate, and sufficient, given the bank's risk profile.

### Audit Considerations

Internal auditors should understand the relationship among strategy, risk appetite, and the capital planning process and should be able to evaluate whether the three elements are an integrated unit or whether impediments interfere with managing capital risk in an integrated fashion. Concerns should be reported to the board.

7. Financial Stability Board. Principles for an Effective Risk Appetite Framework.
8. The IIA. The IIA's Three Lines Model.

Bank management should define various risk-related parameters that comply with the risk appetite framework and include them in a **risk appetite statement** and/or capital policy. **Risk capacity** expresses the maximum level of risk the bank can assume given its current constraints, obligations, and status of resources. **Risk limits** indicate how the aggregate risk appetite limits apply across business lines, legal entities, specific risk categories, and other granular levels. **Risk tolerance** may indicate how much variance in risk exposure the institution will accept around trades and the like, given the risk capacity and risk limits.

A management committee (typically an assets and liabilities committee, or ALCO) should review the capital plan, monitor conformance to the bank's stated risk appetite, and oversee decision-making related to managing assets and liabilities. This oversight includes evaluating and reacting to changing market conditions and ensuring liquidity and the adequacy of capital resources. Management should consider applying both qualitative and quantitative criteria when monitoring the bank's strategies, capital, liquidity, reputation, and risk profile.

Management may use the results of stress testing to validate the appropriateness of limits set by the risk appetite framework. Banks should articulate consistency between capital targets, stress tolerances, and potential crisis/failure thresholds. The capital adequacy policy should define the protocols to escalate situations that reach or exceed the limits.

### *Economic Capital*

Economic capital (eCap) is the amount of risk capital that a bank estimates it needs to remain solvent at a given confidence level and time horizon. Banks use eCap and internal capital models to calculate the quantity of capital required to execute their strategy and obtain the desired yields from their business lines, products, and activities while remaining solvent.

Economic capital helps banks identify deals that may appear to generate significant profits but have more than a proportional capital charge. It also draws attention to businesses that offer high risk-adjusted returns. This information assists the bank in balancing the need for profitability against requirements for regulatory capital.

## Determine Earnings at Risk and Capital at Risk

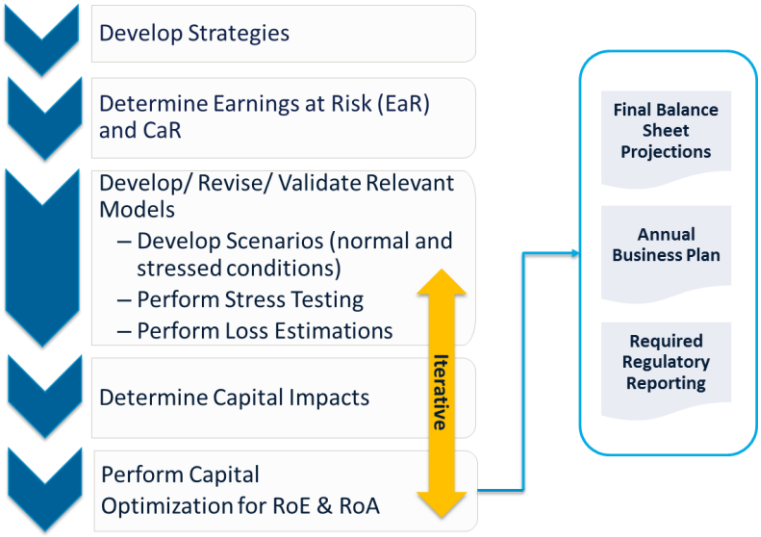
Elements of the capital planning process are often done in parallel. These elements include determining **earnings at risk (EaR)** and **capital at risk (CaR)**, risk modeling for normal conditions, stress testing, and aggregating the impacts to capital. The process is iterative, so these models keep running. The inputs and outputs change rapidly. EaR is the amount that net income may vary due to interest rate changes over a defined period. CaR is the amount of capital available to cover risks. Banks need to calculate both EaR and CaR before stress testing.

## Stress Testing

Stress testing, a critical component of capital planning, is central to the iterative process of strategy selection, as shown in **Figure 2**. Stress testing allows management to evaluate a bank's consolidated risk exposure and financial position under severe yet plausible macroeconomic and idiosyncratic scenarios. These evaluations enable management to forecast how financial results

and capital positions would vary under the different scenarios, see the potential worst-case outcomes of various risks, and determine the amount of capital needed to absorb losses if large shocks occur.

Figure 2: Capital Planning Process: Stress Testing




For example:

- The impact of different market and economic stressors on the financial results and metrics of various business units.
- The effect of various capital actions (such as dividend payouts, share repurchases, debt, and capital restructuring) on financial results and capital position/ratios.

Stress testing supplements other risk management techniques and plays a vital role in:

- Testing the bank's risk appetite and risk tolerance.
- Providing forward-looking assessments of risk.
- Overcoming limitations of models and historical data.
- Informing capital and liquidity planning procedures.
- Interacting with other essential elements of the risk management framework, such as the recovery and resolution plan.
- Developing risk mitigation or contingency plans in stressed conditions.

### Audit Considerations

Supervisors will expect the institution to estimate losses, revenue, expenses, and capital that take into account the macroeconomic drivers relevant to them. Key variables should be clearly documented.

The organization should also establish and maintain a dependable control environment. The capital planning process allows an internal review of the organization's strategies and procedures. Together, forecasting and capital planning should fulfill the requirements of the capital adequacy policy. This process should include verifying that the strategic plan captures

risks sufficiently to keep risk exposures within the thresholds established in the risk appetite framework.

While historical data is the basis for some models of calculating capital for credit, market, and operational risk, in scenario-based forecasting, bank experts should base specific scenarios on the idiosyncratic risks unique to the bank's risk profile and operations. Then, they perform scenario-based stress tests that project losses in the future, given a significant shock.

## *Designing Scenarios for Stress Testing*

An effective scenario design process should link directly to the institution's strategic risk assessment and enable nonfinancial and non-quantifiable risks to be incorporated into the stress testing analysis. Supervisors will expect banks to articulate how nonfinancial risks are incorporated into stress testing and ultimately into the decisions made during the capital planning process.

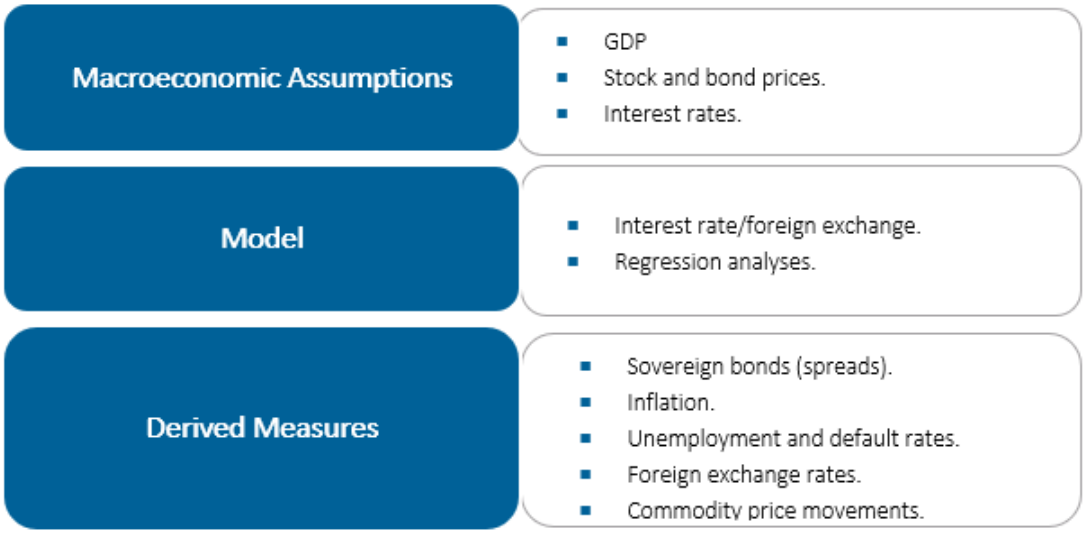
### Audit Considerations

Internal auditors should carefully examine the scenario development process to ensure that all parties are involved at the appropriate stage and that data from all relevant parties are properly considered.

Banks should also consider the potential for multiple stressful conditions happening simultaneously or in rapid succession, which cumulatively may exacerbate the adverse effects of stressed conditions.

In addition, models and regressions make it possible to derive secondary parameters from primary parameters. Secondary parameters could include interest rate/foreign exchange rate models and regressions of the GDP versus the probability of default, as shown in **Figure 3.**

Figure 3: Secondary Risk Parameter Scenario




## *Scenario: Recession*

Examples of stressors that could be included in a stress-testing model for a recession scenario are:

- Increasing consumer debt levels and leveraged buying in the stock market cause a recession in one country or region.
- Households in the country/region take on too much debt and start falling behind on payments, which causes the demand for consumer goods to decrease.
- Imports decrease.
- GDP declines.
- Unemployment rates increase.
- Loan defaults increase, impacting the availability of credit.
- The recession spills over into other regions of the world.
- Increasing sovereign debt becomes critical, and several banks fail.
- Interest rates rise Increasing sovereign.
- Credit is restricted globally.

These recession stressors must be assessed to quantify the effect on the financial institution through stress testing. The first step in designing a stress test is to distribute the primary parameter sets to each affected business line of the bank. Within the business lines, the stressed values are determined and aggregated to calculate the full effect of the stressor on the financial institution.

According to the Federal Reserve Bank's Letter SR 15-18:

> The firm's [bank's] stress testing practices should capture the potential increase in losses or decrease in pre-provision net revenue (PPNR) that could result from the firm's risks, exposures, and activities under stressful scenarios … Projections of losses and PPNR should be done at a level of granularity that allows for the appropriate differentiation of risk drivers, while balancing practical constraints such as data limitations.

## Final Reporting

The final steps in the capital planning process begin when the iterative modeling processes are complete to the satisfaction of senior management. When senior management has settled on a strategy for the year, information produced during the capital planning process should be consolidated to create final versions of balance sheet projections, the business plan, and required regulatory reports.

### Audit Considerations

Internal audit should, at a minimum, validate the accuracy of final regulatory reports against the results of internal audit engagements relevant to the capital planning process as a part of assurance activities.

When finalizing the balance sheet projections, management should clarify the relationships among revenues, expenses, and on- and off-balance sheet exposures under stressed conditions. Any changes planned in the institution's asset mix and the resulting **risk-weighted asset** (RWA) changes must be consistent with pre-provision net revenue and loss estimates. The bank

should tie this information back to its strategic risk assessment and the risk assessments undertaken by management. Scenarios that drive increased losses, reduced revenues, and significant changes to the balance sheet and RWAs over the planning-time horizon should be noted in detail.

Once this analysis is complete, management can create a final business plan that specifies how capital will be allocated to strategies, business lines, products, and more; defines the minimum scope of elements requiring comment in reporting; and generates regulatory reports.

# Overview of Regulatory Capital

**The Basel Framework** requires banks to maintain minimum capital levels to cover losses proportionate to the risky assets held on their balance sheets. Each bank is responsible for maintaining a minimum capital adequacy ratio, which is a percentage of the bank's capital to its RWAs. RWAs estimate risks to determine the minimum level of regulatory capital a bank must maintain to deal with unexpected losses.[9] According to the Basel Framework and other regulatory guidance, banks must establish processes to measure and assess risks related to capital for credit, market, and operational risks against respective RWAs to allocate appropriate capital. Banks with a regional and global presence should consider the relevant capital requirements established by local, state, and national regulations, as well as international standards.

The Basel Framework divides capital into Tier 1 and Tier 2. Additionally, the Basel Framework also requires capital buffers and specifies classification criteria for the components of regulatory capital.[10] Tier 1 ("going concern") capital comprises Common Equity Tier 1 (CET1) plus Additional Tier 1. Total regulatory capital is the sum of Tier 1 and Tier 2 ("gone concern") capital, net of regulatory adjustments.

## Tier 1 Capital

Tier 1 capital is known as going concern capital, which means it enables the bank to absorb losses without needing to cease trading activities. In other words, the bank remains viable and operational even when it has suffered significant losses.

While Tier 1 capital consists of CET1 and Additional Tier 1 capital, the Basel Framework considers only common equity to be core capital and lays out specific criteria that an instrument must meet in full to count as CET1 capital. Examples of this high-quality liquid capital include:

1. Bank-issued common shares that meet specific criteria.
2. Stock surplus (share premium) resulting from the issue of instruments included CET1.
3. Retained earnings.
4. Accumulated other comprehensive income and other disclosed reserves.
5. Common shares issued by consolidated subsidiaries of the bank and held by third parties (i.e., a minority interest) that meet specific criteria (described in CAP10.20 to CAP10.26).
6. Regulatory adjustments applied in the calculation of CET1.[11]

9. Basel III Compliance Professionals. "Basel III Accord."
10. Basel Committee. "RBC – Risk-based capital requirements."
11. Basel Committee. "CAP – Definition of capital, CAP10".

Additional Tier 1 capital consists of the sum of the following elements:

1. Instruments issued by the bank that meet specific criteria and are not included in Common Equity Tier 1.[12] For example, Additional Tier 1 capital may include perpetual bonds.
2. Stock surplus (share premium) resulting from the issue of Additional Tier 1 capital instruments.
3. Instruments issued by consolidated subsidiaries of the bank and held by third parties that meet specific criteria described in the Basel Framework's CAP10.20 to CAP10.26
4. Regulatory adjustments applied in the calculation of Additional Tier 1 capital.

Basel III sets out minimum requirements that instruments must meet or exceed to be included as Additional Tier 1 capital. Some types of instruments that would not qualify for inclusion in Additional Tier 1 capital are:

- Subordinated debt.
- Unsecured debt.
- Instruments with a maturity date.
- Instruments with a credit-sensitive dividend feature.
- Special purpose vehicles/off-balance sheet liabilities (that are not issued out of an operating entity or the holding company in the consolidated group).[13]

However, these instruments may qualify for inclusion in Tier 2 capital.

Determination of CET1 requires organizations to calculate and deduct regulatory adjustments for some items. These adjustments account for balance sheet items that are intangible assets, hedging an exposure, or accruals for expenses the organization will incur in the future. The adjustments also help the bank avoid counting specific capital amounts twice. Some of the items deducted from Tier 1 or Tier 2 capital will receive different risk weightings and may be deducted at different rates.[14]

## Tier 2 Capital

Tier 2 capital (CET2) is also known as gone concern capital, which means the business is no longer viable. This type of capital represents the less liquid, lower-quality assets to be consumed in a fatal situation for the bank. General loan loss reserves are eligible for inclusion in Tier 2 but are limited to a maximum of 1.25 percentage points of credit risk-weighted assets calculated under the standardized approach.[15] Tier 1 capital may not include loan loss reserves in any form.

The Basel Framework requires banks to meet specific minimum risk-based capital requirements at all times. The requirements mandate the capital to be used net of regulatory adjustments and subject to the transitional arrangements defined in the Basel Framework. The minimum capital requirements are as follows:

12. Basel Committee. "CAP – Definition of capital, CAP10."
13. Basel Committee. "CAP - Definition of capital, CAP10."
14. Basel Committee. "CAP – Definition of capital, CAP30,"
15. Basel Committee. "CAP – Definition of capital, CAP10."

1. CET 1 must be at least 4.5% of RWA.
2. Tier 1 capital must be at least 6% of RWA.
3. Total Tier 1 and Tier 2 capital must be at least 8% of RWA.
4. Total Tier 1 and Tier 2 capital plus the capital conservation buffer must be at least 10.5% of RWA at all times.[16]

Basel Framework sections 10.20 through 10.26 describe additional criteria and details for minority (noncontrolling) interest and other capital issued out of consolidated subsidiaries held by third parties.

## Supplementary Capital: Capital Conservation Buffers, Countercyclical Buffers

The Basel Framework requires capital buffers as further assurance of safety and soundness. Capital buffers should consist of Tier 1 qualified instruments, as detailed above, so they are readily accessible and liquid if needed.

The category includes:

- *Capital conservation buffer* — designed to ensure that banks build up capital buffers outside periods of stress that can be drawn down during periods of stress. In addition to the minimum risk-based capital requirements described previously, banks must maintain a CET1 capital conservation buffer set at 2.5% of RWA.
- *Capital countercyclical buffer* — designed to achieve the macro-prudential goal of protecting the banking sector from periods of excessive credit growth, which is often associated with the buildup of system-wide risk. Systematically important banks may be subject to a countercyclical capital buffer or higher loss-absorbency requirements, as described in Basel Framework sections "RBC30 – Buffers above the regulatory minimum" and "RBC40 – Systemically important bank buffers."[17]

## Risk-weighted Assets

The concept of RWA is simple but calculating it for a financial institution of any size is challenging. Banks are required to hold capital in proportion to the level of risk associated with the assets on their balance sheets. However, numerous factors determine the specifications for classifying assets (Tier 1 and Tier 2) and making regulatory adjustments. Additionally, starting balances for on- and off-balance sheet exposures and applicable risk weights form the foundation for estimates of post-stress testing capital adequacy ratios. Any deficiencies or inaccuracies in these starting balances will only compound throughout the capital planning process.

Here is a simplified example of the RWA concept: Regulations deem cash and high-quality investment-grade sovereign bonds to exhibit little if any credit risk. Therefore, banks could assign

16. Basel Committee. Basel III phase-in arrangements.
17. Basel Committee. "RBC – Risk-based capital requirements."

them no risk score and reserve no capital. Conversely, a subprime mortgage that is 90 days past due on its payments may require a capital reserve of 50% or more of its anticipated cash flows.

To calculate RWA, banks must perform this evaluation process for all asset categories and sum up the capital required based on the assigned risk weightings. That sum is the minimum level of capital needed for that bank.

The internal audit activity should review and understand the RWA measurement methodology, including the metrics, the factors required to measure RWA, the assets being measured, and how different assets apply RWA methodologies. Internal auditors may find studying the following items helpful in guiding their assessment: the applicable regulatory guidance, footnotes, and disclosures in the financial statements, balance sheet breakdown reports, and minutes from asset/liability committee meetings.

## Capital for Credit Risk

Capital for credit risk covers all assets in the bank's portfolio that have an element of credit risk, each weighted according to its respective riskiness. Banks must maintain a certain percentage of RWAs as capital to meet any losses due to default. To ascertain capital for credit risk, banks can use the standardized approach or an internal ratings-based (IRB) approach, which applies models such as the advanced internal rating-based (A-IRB) approach and the foundation internal rating-based (F-IRB) approach. Banks that use modeled approaches must have those models approved by their regulator.

### *Expected Loss and Return on Equity*

Each year a certain percentage of borrowers and counterparties will default. If the probability of default (PD) forecast is lower than the realized default rates, the bank will have additional write-offs. Amounts collected during the institution's collections and recovery processes may offset the write-offs. The bank must also forecast their expected loss given default (LGD).

Multiplying the PD and the LGD results in the total expected loss (EL) for the period.

$$PD * LGD = EL$$

If the realized loss is larger than the EL, the return on equity will be less than the amount targeted by management. If the realized loss is smaller than the EL, the return on equity will be more than the forecast by management. The EL is calculated either as a percentage using the above formula or as a dollar amount by multiplying PD, LGD, and the exposure at default (EAD). The dollar amount of EAD then illustrates the tangible value of an asset.

In its 2017 publication "High-level Summary of Basel III Reforms" the BCBS provides suggested minimum parameters for PD, LGD, and EAD in IRB approaches, along with expected implementation dates and transitional arrangements.[18]

### *Loss Given Default: Three Approaches*

The second part of the expected loss equation is loss given default (LGD). LGD tools assess the value and the quality of an asset the bank holds in exchange for providing a loan. Securities can

18. Basel Committee. *High-level Summary.*

be hard assets such as cars and machinery, mortgages, commodities, or any number of other options. The higher the value of the security, the lower the LGD and the lower the EL.

There are three approaches to determining LGD values per the Basel Framework:

1. The A-IRB or advanced approach, in which banks use internal models to determine their PD and LGD values.
2. The F-IRB, in which banks are allowed to model only a specific set of parameters and must use prescribed calibrations for certain asset classes.
3. The standardized approach, in which regulators prescribe risk weights for various asset classes.

### Audit Considerations

Internal auditors should know which approach an institution is using to measure credit risk. Further, if the institution is using A-IRB for any products, auditors should understand why and ensure the models have been regulator approved, validated, and tested appropriately.

Banks may choose which method they will use by asset class (e.g., A-IRB for mortgages and F-IRB for corporates). However, most banks will use either A-IRB or F-IRB rather than picking and choosing by asset class. Globally, supervisors favored the standardized approach throughout the initial phase of the Basel Framework implementation.

### *Current Expected Credit Losses*

In addition to the widely accepted Basel Framework capital requirement standards, two standards impacting credit risk are "Current Expected Credit Losses" issued in the United States by the Financial Accounting Standards Board and by International Financial Reporting Standard 9, published in Europe. Both standards affect how financial services firms must calculate estimated losses and their associated capital charges and reserves. The IIA's Practice Guide "Auditing Credit Risk Management" explains this topic in detail.

## Capital for Market Risk

Capital for market risk consists of the banking assets that are exposed to underlying market factors; that is, the potential that the value of a trading portfolio decreases due to changes in the value of market risk factors that contribute to the portfolio's end-value price. For example, market risks include exposure to currency and commodity prices, interest rates, and stock and security prices. Banks weigh the risks of such assets and must allocate capital as a percentage of RWA to ensure they can absorb any losses arising due to movements in market prices. Organizations measure capital requirements for market risks through either the standardized approach or internal models approach (IMA), described below.[19]

### *Standardized approach*

A key component of market risk is pricing. Banks divide their portfolios into two categories: the trading book and the banking book. The trading book consists of instruments the bank intends to actively trade, which are subject to market risk capital requirements. The banking book consists

19. Basel Committee. "MAR – Calculation of RWA."

of instruments the bank plans to hold until maturity, and these are subject to credit risk capital requirements.

Instruments in the trading book are priced to market daily. Organizations do not price instruments in the banking book until they reach maturity or are reclassified into the trading book. The BCBS has imposed strict limits on the movement of instruments between books and dictated proper treatment of additional capital charges in the event of a move.[20]

### *Internal Models Approach*

The Basel Framework calls for home and host country **banking supervisors** to work together to ensure consistency in the criteria used to approve or prohibit a bank's use of IMA. Supervisors assess a bank's overall risk management program, the skill of its staff, and its history in measuring risk exposures accurately. Supervisors approve on a trading-desk-by-trading-desk basis.

To use internal models, banks must satisfy the qualitative standards promulgated by various supervisors. For example, according to BCBS, the bank must have an independent risk control unit. This unit should produce and analyze daily reports on the output of the bank´s risk measurement model and must conduct regular backtesting and profit and loss attribution programs, among others.

The total IMA capital requirement is the aggregation of three components, as shown in **Figure 5**:

- Expected shortfall (ES).
- Default risk charge (DRC).
- Stressed capital add-on for non-modellable risks (SES).

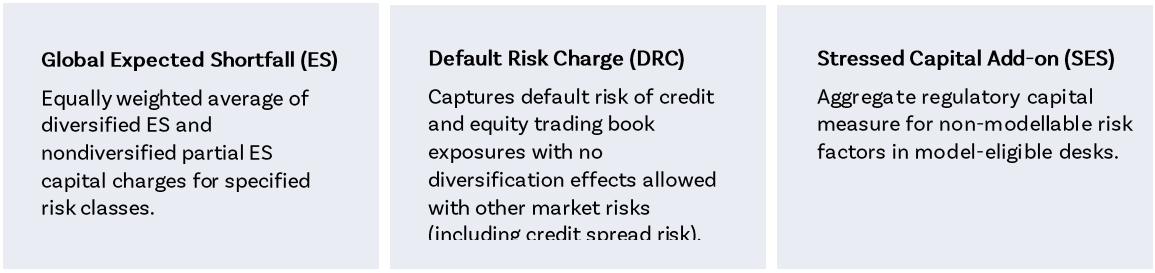
The DRC captures the default risk of credit and equity trading book exposures with no diversification effects allowed with other market risks. The SES is an aggregate regulatory capital measure for risk factors that cannot be modeled in model-eligible trading desks.

The total IMA capital requirement is an aggregation of ES, DRC, and SES. Securitization exposures in the trading book are not eligible for the IMA approach and must be capitalized using the standardized approach.

The IIA's Practice Guide "Auditing Market Risk in Financial Institutions" explains the components in greater detail.

20. Basel Committee. "RBC - Risk-based capital requirements."

Figure 5: The components of the Total IMA Capital Requirement




Source: Basel Committee: "Revised market risk framework."

## Operational Risk

Capital for operational risk must be maintained to offset operational losses due to exposure to internal or external events involving people, processes, and technology. The nature of some operational risk exposures (e.g., misconduct) is not conducive to measurement by models. However, the significant effect operational risk can have on an organization cannot be understated. With ever-expanding and evolving cybersecurity risks coupled with environmental, social, and governance (ESG) and business-as-usual (BAU) operational concerns, properly quantifying capital requirements to assist in managing these operational risks is critical.

BCBS stated that the 2007–2009 financial crisis highlighted two main shortcomings with the existing operational risk framework. First, capital requirements for operational risk proved insufficient to cover operational risk losses incurred by some banks. Second, the nature of these losses — covering events such as misconduct and inadequate systems and controls — highlighted the difficulty associated with using internal models to estimate capital requirements for operational risk. Therefore, BCBS streamlined the operational risk framework.

### Helpful Resource for Internal Auditors

The Federal Reserve Bank in the United States has published several guides about modeling operational risk and the validity of various approaches in the context of its stress testing guidance for the **Dodd-Frank Act**. The most comprehensive is the *Dodd-Frank Act Stress Test 2016: Supervisory Stress Test Methodology and Results*.

As the risk is always "in the tails" of the distributions, the FRB has been experimenting with ways to adequately capture that risk for banking institutions that may not have experienced an exponential loss related to operational risk. The FRB information on how operational risk models and scenarios have evolved due to stress testing requirements (basically, what is working and what is not) can be helpful to internal auditors examining operational risk models in any context.

### *Advanced Measurement Approach*

Banks' internal models are the basis for the advanced measurement approach for calculating operational risk capital requirements. This approach replaces the existing three standardized approaches with a single risk-sensitive standardized approach to be used by all banks.[21]

### *Standardized Approach*

Three components comprise the standardized approach:

- The business indicator (BI), a financial statement-based method for calculating operational risk.
- The business indicator component (BIC), calculated by multiplying the BI by a set of regulatory-determined marginal coefficients.
- The internal loss multiplier (ILM), a scaling factor based on a bank's average historical losses and the BIC.

Internal auditors should assure the board that the organization complies with applicable regulatory requirements related to the quality of loss data when accounting for potential losses due to operational risk occurrences.

Internal auditors should obtain evidence that the bank under review uses the approaches approved by relevant regulatory bodies to measure credit, market, and operational risks. Capital should be maintained in compliance with such guidelines. Capital policy documents, model documentation, asset/liability committee minutes, and the findings of previous regulatory examinations should specify such requirements.

## Leverage Ratio

The leverage ratio is a regulatory measure of indebtedness that attempts to guarantee the bank's solidity and financial strength. BCBS introduced leverage ratio guidelines in 2014 to address the buildup of excessive on- and off-balance sheet leverage by banks.[22] The guidelines constrain the disproportional growth of banks' balance sheets. To avoid an excessive leverage ratio, supervisors require banks to operate within the regulatory ratio limits of the total balance sheet to Tier 1 capital. Banks must measure the size of their balance sheets (inclusive of on- and off-balance sheet items) and compare them against the Tier 1 capital they hold.

In the Basel Framework, the leverage ratio is defined as the capital measure (numerator) divided by the exposure measure (denominator), with this ratio expressed as a percentage. The minimum ratio required is 3%, with a numerator (capital measure) as Tier 1 capital of the risk-based capital framework and the denominator (exposure measure) as the accounting value of the on-balance sheet exposures, derivative exposures, securities financing transactions, and off-balance sheet items.[23]

21. Basel Committee. "OPE – Calculation of RWA."
22. Basel Committee. "LEV – Leverage ratio."
23. Basel Committee. "LEV – Leverage ratio."

Supervisors have provided guidance to banks on the factors that must be used to convert off-balance sheet exposures based on their respective riskiness. Every month, banks must calculate their leverage ratio and report it to their local regulator. Organizations should establish a target for their leverage ratio and monitor it monthly.

The Basel III reform introduced a leverage ratio buffer for G-SIBs. The leverage ratio buffer for each G-SIB is 50% of its risk-based capital buffer. For example, a bank with a 2% risk-based buffer has a 1% leverage ratio buffer, which added to the minimum 3% leverage ratio required by the Basel Framework, means a G-SIB must maintain a leverage ratio of at least 4%.[24]

The internal audit activity may consider providing ongoing and independent monitoring of the institution's leverage ratio. The leverage ratio may be a key indicator that something has gone wrong with executing the strategies developed from the capital planning process. At a minimum, monitoring the leverage ratio may indicate the institution's performance against its capital plan.

## Recommendations for Disclosure

The objective of the Basel Framework's capital disclosure requirements is to improve transparency on

banks' capital positions, particularly in the quality of the capital held against the risks a bank incurs.

Basel Framework requirements include:

- Using a common template to report the breakdown of regulatory capital.
- Using a three-step process to ensure a complete reconciliation of all regulatory capital elements back to the institution's balance sheet.
- Using a common template to describe the main features of regulatory capital instruments used.
- Providing the full terms and conditions of regulatory capital instruments on websites.
- Using a common template during the transition period.[25]

### Audit Considerations

.In the case of public banks, the internal audit activity should review the financial statement disclosures/footnotes as constructed by the external auditors for completeness and accuracy as part of assurance activities

24. Basel Committee. "LEV – Leverage ratio."
25. Basel Committee. Consultative Document.

# Planning Engagements to Assess Capital Adequacy

When planning an internal audit engagement, internal auditors should identify whether the bank has a unified and cohesive governance structure in place, with a risk appetite framework, policies, processes, and tools to consistently manage the environment and mitigate the risks related to capital planning. Note that the recommended guidance provided focuses on considerations specific to capital adequacy. Mandatory guidance and the Code of Ethics as defined in the IPPF must be followed at all times, regardless of the internal audit engagement.

Because capital management is vital to the safety and soundness of the bank, the internal audit plan should provide assurance, over a reasonable period, to senior management and the board that the capital planning process is operating correctly and within regulatory guidelines. This period could be between one and three years, depending on the institution's size, business model, and risk profile.

## Gathering Information

The **chief audit executive** (CAE), or internal auditors assigned by the CAE, should be involved in various meetings throughout the bank regarding capital risks, capital risk management, and strategic planning. Information that pertains to capital planning may lead internal auditors to include the business line, product, or a specific model in the scope and objectives of internal audit engagements relevant to the capital planning process. This information will also help internal auditors identify risk information.

Once internal auditors have identified the departments, functions, and roles relevant to managing capital adequacy risk, they should gather appropriate documentation to support the

### Applying the IPPF

Standards 2200 through 2240 guide internal auditors through engagement planning, including these steps:

1. Understand the context and purpose of the engagement.
2. Gather information to understand the area or process under review.
3. Conduct a preliminary risk assessment of the area or process under review.
4. Form engagement objectives.
5. Establish engagement scope.
6. Allocate resources.
7. Document the engagement plan.
8. Develop and document work programs.

The IIA Practice Guide "Engagement Planning: Establishing Objectives and Scope" provides additional details.

preliminary risk assessment and plan the audit engagement. The following elements can help the bank achieve the objectives of its capital adequacy strategy:

- Charters, policies, and other mandate information for the governance entities responsible for establishing the capital adequacy strategy.
- Any documents or personnel that can assist in understanding the minimum capital required, a key driver of capital adequacy strategy.
- Documentation of all phases of the capital planning process, including how Tier 1 and Tier 2 capital is classified and how the accuracy of RWA calculations is verified.
- Results of modeling for credit, market, and operational risks.
- Documentation of the process for designing and running normal and stress scenarios.
- Reports containing the results of stress testing.

Other sources of information to be evaluated year-round as potential early warning indicators that the bank's capital processes are not performing within defined limits include:

1. Material changes in the capital adequacy ratio or leverage ratio.
2. Reports and examinations by supervisors and other internal and external assurance providers for any observations identified.
3. Significant losses in product lines or business lines that were not indicated in the capital plan.

Any areas of concern noted during preliminary planning should be reflected in the risk assessment and possibly the engagement objectives and scope.

## Conducting the Preliminary Risk Assessment

When planning individual engagements involving capital adequacy, internal auditors should consider the last time an end-to-end engagement was completed and should review past work papers, internal audit reports, and the organization-wide risk assessment. Auditors should also consider completion dates for the last targeted engagement.

### Note

More information on model risk management appears in The IIA Practice Guide "Auditing Model Risk Management."

To assess risks, internal auditors should account for the financial, operational, and regulatory impacts of capital adequacy risks and the nonfinancial effects, such as damage to the organization's reputation or relationships with customers or vendors. For example, an error in data in an upstream model may have material impacts on downstream models. Some risks may seem insignificant on their own but should be considered in the context of the bank's capital strategy. Factors to consider when assessing likelihood include past risk occurrences, risk impact data from proxy sources, and the complexity and number of people involved in the process.

## Establishing the Engagement Scope

Assessments of the capital planning process should enable internal auditors to determine whether the end-to-end process is functioning within the expectations of supervisors and the board and as described in approved policies and procedures. An assessment may result from a single end-to-end engagement or may be the culmination of multiple annual reviews that assess specific segments of the capital risk management process in a multi-year audit cycle.

For example, in year one, internal auditors may choose to review the governance process related to the risk appetite framework and strategic planning to assure that board oversight is appropriate and that reporting is complete and timely. In year two, internal auditors could focus on operational risk and stress testing. In year three, an engagement could focus on credit and market risk. Regulatory reporting would be examined in each of the three years.

Additionally, internal auditors may target engagements to specific business lines, regions, or product lines. A targeted approach could include stand-alone assessments of capital planning, the risk appetite framework, stress testing, and the leverage ratio. In the stand-alone assessments, internal auditors may test and report on the phases of the capital planning process that consume most of the time and resources.

## Allocating Resources

In conformance with Standard 1210-Proficiency, internal auditors must possess the knowledge, skills, and other competencies needed to perform their individual responsibilities. In addition, the Code of Ethics requires internal auditors apply the knowledge, skills, and experience needed in the performance of internal audit services. The CAE should periodically assess the skills of internal auditors to ensure that the internal audit activity has the appropriate skills to evaluate the organization's capital adequacy. Competencies needed to examine and validate models may include:

- The ability to run sample data through models independently to determine whether the results are consistent with those reported by management.
- The ability to understand the technical change control process used to create and revise the models.
- The ability to determine whether the source code values are updating automatically and accurately or linking to the appropriate sources (rather than hard coded into the models).
- The ability to evaluate the model validation process, including documentation, validation methods, and competency of personnel (either internal or external) performing the validations.
- The ability to determine error rates and instability in data feeds.

Details on planning and scoping internal audit engagements appear in The IIA Practice Guide "Engagement Planning: Establishing Objectives and Scope."

## Performing the Engagement

When constructing engagement work programs, internal auditors should be careful to establish realistic timelines for testing.

Internal auditors may not always have access to the most up-to-date data while executing their capital planning internal audit engagement. They also may not have timely access to the personnel needed to validate controls present in the capital planning process. The CAE should mitigate these risks proactively by ensuring either the internal audit activity has or obtains the competencies to perform the required analyses (per Standard 1210) or that a plan is in place to rely on the work of others.

## Communicating the Results of the Engagement

After completing the engagement work, internal auditors must communicate their results (per Standard 2400-Communicating Results). They may give an opinion on the effectiveness and efficiency of the governance, risk management, and controls involved in capital planning. This opinion may conclude on the efficiency and effectiveness of the bank's model risk management program, the stress scenarios applied to the models (if not provided/required by the regulator), and the accuracy of the stress tests and scenarios in relation to the economic environment faced by the bank. Because capital planning is so vital to the safety and soundness of the bank, the CAE should follow standard reporting procedures for all capital adequacy audits and report directly to the board.

# Appendix A. Relevant IIA Standards and Guidance

The following IIA resources were referenced throughout this practice guide. For more information about applying the *International Standards for the Professional Practice of Internal Auditing*, please refer to The IIA's Implementation Guides.

| Related IIA Standards |
| --- |
| Standard 1210 – Proficiency |
| Standard 2200 – Engagement Planning |
| Standard 2201 – Planning Considerations |
| Standard 2210 – Engagement Objectives |
| Standard 2220 – Engagement Scope |
| Standard 2240 – Engagement Work Program |
| Standard 2330 – Documenting Information |
| Standard 2400 – Communicating Results |

| Related IIA Guidance |
| --- |
| Practice Guide "Auditing Credit Risk Management," 2020. |
| Practice Guide "Auditing Liquidity Risk: An Overview," 2018. |
| Practice Guide "Auditing Market Risk in Financial Institutions," 2020. |
| Practice Guide "Auditing Model Risk Model Risk Management," 2018. |
| Practice Guide "Engagement Planning: Establishing Objectives and Scope," 2017. |
| The IIA, *The IIA's Three Lines Model: An Update of the Three Lines of Defense*, 2020. |

# Appendix B. Glossary

Definitions of terms marked with an asterisk are taken from the "Glossary" contained in The IIA's publication, "*International Professional Practices Framework*®, 2017 edition" (also known as the Red Book), published by the Internal Audit Foundation.

**banking supervisors** — Regulatory agencies tasked with examining banking organizations to ensure they are operating in a safe and sound manner and following laws and regulations.

**capital** — According to Basel III, consists of the sum of Tier 1 capital (going-concern capital) and Tier 2 Capital (gone-concern capital). For each category, there is a single set of criteria that instruments are required to meet. Those requirements are described in Basel documentation.

**capital adequacy** — Having sufficient capital to run an institution's business while still absorbing the risk and volatility of its credit, market, and operational threats.

**capital adequacy ratio** — A measurement of a bank's available capital expressed as a percentage of a bank's risk-weighted credit exposures. It also is known as the capital-to-risk weighted assets ratio and measures both Tier 1 and Tier 2 capital.

**capital at risk (CaR)** — The amount of capital available to cover risks.

**chief audit executive*** — Describes the role of a person in a senior position responsible for effectively managing the internal audit activity in accordance with the internal audit charter and the mandatory elements of the *International Professional Practices Framework*. The chief audit executive or others reporting to the chief audit executive will have appropriate professional certifications and qualifications. The specific job title and/or responsibilities of the chief audit executive may vary across organizations.

**Dodd-Frank Act** — U.S. Dodd-Frank Wall Street Reform and Consumer Protection Act. Financial reform legislation passed by the Obama administration as a response to the financial crisis of 2007–2009.

**earnings at risk (EaR)** — The amount of change in net income due to changes in interest rates over a specified period. The EaR calculation includes balance sheet items that are considered sensitive to changes in interest rates and generate income or expense cash flows.[26]

**global systemically important banks (G-SIBs)** — A bank whose systemic risk profile is deemed to be of such importance that the bank's failure would trigger a wider financial crisis and threaten the global economy. The Basel Committee has developed a formula for

26. Investopedia, "Dictionary."

determining which banks are G-SIBs, deploying criteria including size, interconnectedness and complexity.[27]

**leverage ratio** — According to Basel III, the capital measure (the numerator) divided by the exposure measure (the denominator), with this ratio expressed as a percentage: leverage ratio = capital measure/exposure measure.

**liquidity** — The ability of a bank to fund increases in assets and meet obligations as they come due without incurring unacceptable losses.[28] **Liquidity** refers to a bank having assets that it can quickly convert to cash in amounts sufficient to satisfy current and expected financial obligations, including all customer demands for printed and minted money.

**risk appetite*** — The level of risk that an organization is willing to accept.

**risk appetite framework** — The overall approach including the policies, processes, limits, controls, and systems through which risk appetite is established, communicated, and monitored. It includes a risk appetite statement, risk limits, and an outline of the roles and responsibilities of those overseeing the implementation and monitoring of the risk appetite framework. The risk appetite framework should consider material risks to the bank and its reputation vis-à-vis policyholders, depositors, investors, and customers. The risk appetite framework aligns with the institution's strategy.[29]

**risk appetite statement** — The written articulation of the aggregate level and types of risk that a bank will accept or avoid to achieve its business objectives. It includes quantitative measures expressed relative to earnings, capital, risk measures, liquidity, and other relevant measures as appropriate. It should also include qualitative statements to address reputation and conduct risks as well as money laundering and unethical practices.[30]

**risk-based capital** — The amount of capital supervisors deem necessary for an institution to maintain its overall business operations.

**risk capacity** — Maximum acceptable risk exposure before breaching capital and liquidity needs.

**risk limits** — The allocation of a financial institution's aggregate risk appetite statement to business line, legal entity levels, specific risk categories, concentrations, and as appropriate, other levels. Risk limits should be specific and sensitive to the shape of actual portfolios, measurable, frequency-based, reportable, and based on forward-looking assumptions.[31]

**risk management*** — A process to identify, assess, manage, and control potential events or situations to provide reasonable assurance regarding the achievement of the organization's objectives.

**risk tolerance** — The acceptable variation in outcomes related to specific performance measures linked to objectives the entity seeks to achieve.[32]

27. Risk.net, "Risk Glossary."
28. Basel Committee. Principles for Sound Liquidity.
29. Basel Committee. Principles for Sound Liquidity.
30. Financial Stability Board, "Principles for An Effective Risk Appetite Framework."
31. Financial Stability Board. "Principles for An Effective Risk Appetite Framework."
32. Beasley, Hancock, and Branson. Strengthening Enterprise Risk Management.

**risk-weighted asset** — Used to determine the minimum amount of capital that must be held by banks and other financial institutions to reduce the risk of insolvency. The capital requirement is based on a risk assessment for each type of bank asset.

# Appendix C. Total Loss-Absorbing Capacity (TLAC) Standard for Global Systemically Important Banks

In November 2015, the Financial Stability Board (FSB) issued the final total loss-absorbing capacity (TLAC) standard for global systemically important banks (G-SIBs). The TLAC standard ensures that:

- G-SIBs will have sufficient loss-absorbing and recapitalization capacity available in resolution for authorities to implement an orderly resolution that minimizes impacts on financial stability, maintains the continuity of critical functions, and avoids exposing public funds to loss.
- G-SIBs will be required to meet the TLAC requirement alongside the minimum regulatory requirements set out in the Basel III framework. Specifically, they will be required to meet a minimum TLAC requirement of at least 16% of the resolution group's risk-weighted assets (TLAC RWA Minimum) from Jan. 1, 2019, and at least 18% from Jan. 1, 2022. Minimum TLAC must also be at least 6% of the Basel III leverage ratio denominator (TLAC Leverage Ratio Exposure [LRE] Minimum) as from Jan. 1, 2019, and at least 6.75% from Jan. 1, 2022.
- G-SIBs headquartered in emerging market economies will be required to meet the 16% RWA and 6% LRE Minimum TLAC requirement no later than Jan. 1, 2025, and the 18% RWA and 6.75% LRE Minimum TLAC requirement no later than Jan. 1, 2028. This conformance period will be accelerated if corporate debt markets in these economies reach 55% of the emerging market economy's GDP in the next five years.[33]

Experts from the FSB, Basel Committee on Banking Supervision, and Bank for International Settlements (BIS) published the findings of the impact assessment studies alongside the final TLAC standard in the following reports:

- Overview report summarizing the findings of the TLAC impact assessment studies.
- Quantitative Impact Study report conducted by the BCBS.
- Economic Impact Assessment report performed by a group of experts chaired by the BIS.
- Historical Losses and Recapitalisation Needs findings report.

The impact assessment studies found that the micro- and macroeconomic costs of TLAC are relatively contained. The estimated costs for G-SIBs to meet the minimum TLAC requirement translate into increases in lending rates for the average borrower that range from 2.2 to 3.2 basis points, while the median long-run annual output costs are estimated at 2 to 2.8 basis points of GDP. The benefits of TLAC arise from the reduced likelihood and cost of crises and exceed these costs, with even the most conservative assumptions yielding estimated benefits of between 15 and 20 basis points of annual GDP.[34]

33. Financial Stability Board. "FSB issues final Total Loss."
34. Financial Stability Board. "FSB issues final Total Loss."

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