Analyzing Banking Risk

A Framework for Assessing Corporate Governance and Risk Management

FOURTH EDITION

Hennie van Greuning
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Fourth Edition

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1 2 3 4 23 22 21 20

ISBN (paper): 978-1-4648-1446-4
ISBN (electronic): 978-1-4648-1518-8
DOI: 10.1596/978-1-4648-1446-4

Interior design: Kirsten Dennison.
Cover design: Bill Pragluski, Critical Stages, LLC.

Library of Congress Control Number: 2020932936

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Foreword to the Fourth Edition

This fourth edition of *Analyzing Banking Risk* remains faithful to the objectives of the previous editions. The publication aims to summarize and provide overviews of the regulatory and risk management initiatives that took place after the third edition. It includes expanded material on the Basel III changes, as well as new dimensions of operational risk management. Some new topics such as financial technology (fintech), cyber risk, and money laundering have been added. These changes are complex and will challenge banks' executive as well as nonexecutive resources.

Many models exist for analyzing risk of banks and other corporate entities. This publication aims to complement existing methodologies by establishing a comprehensive framework for the assessment of banks, not only by using financial data but also by considering corporate governance. It takes as axiomatic that each of the key players in the corporate governance process (such as shareholders, directors, executive managers, and internal and external auditors) is responsible for some component of financial and operational risk management.

The book uses basic tools and techniques of financial risk analysis principles to demonstrate how data can be converted into information through graphic highlights of risk trends and thereby alert senior management and boards when action may be required.

Given the recurring turmoil in the financial markets, this approach demonstrates the power of basic risk management principles in assisting the nonspecialist director, executive, or analyst to integrate various risk areas and ensures that the interrelationships among different risk categories are clearly portrayed. The proposed framework also accommodates the fact that some risks might be immaterial in less sophisticated environments.

This publication emphasizes risk management *principles* and aims at being useful to a wide body of readers. The target audience remains those responsible

for the analysis of banks and for the senior management of organizations directing their efforts. Because the publication provides an overview of the spectrum of corporate governance and risk management, it is not aimed at the narrow technical specialist who focuses on only one particular risk management area.

Washington, DC
March 2020

Acknowledgments

The authors are grateful to Alfonso Garcia Mora, Director of the Finance, Competitiveness, and Innovation (FCI) Global Practice, for his overall guidance and support, and to Irina Astrakhan, Practice Manager of FCI, who has encouraged the preparation of the fourth edition and assisted in obtaining financing from the Seoul Center for Financial Sector Development.

The publication would not have been possible without the generous support of the Ministry of Economy and Finance of Korea through the Seoul Center for Financial Sector Development partnership. We thank Sameer Goyal and Youjin Choi, the task team leaders for the Seoul Center's Financial Sector Advisory Services and Partnership project, for their support.

Colleagues from the banking regulatory environment and from banks' risk management teams also provided useful insights for which we are grateful. In addition, we used disclosure materials from the annual reports or Pillar 3 regulatory requirements of several listed banks, with appropriate source identification.

Certain chapters leaned heavily on materials of the Basel Committee on Banking Supervision; graphics used are acknowledged in every case. We attempted to summarize and provide overviews of highly complex material.

We wish to thank Frikkie Kleinhans, Jaco Grobler, Willem Punt, and Elize van der Linde of FirstRand Limited; and Michael Davis, Steve Piquito, Tony Johnson, and Dhiren Haripersad of Nedbank Limited for their willingness to assist in interpreting some of the complex capital adequacy materials.

The authors appreciate excellent comments received from the World Bank reviewers, Nagavalli Annamalai and Alexander Berg. Comments related to information technology and effects on operational risk were especially useful. Marinella Yadao assisted in updating charts used in the publication. Patricia Katayama and Mary Fisk skillfully guided our manuscript throughout the publishing process. Editor Mary Anderson contributed to the clarity

of the text. Kirsten Dennison provided informative graphics and an attractive and accessible interior design. Publications Professionals provided additional quality control through excellent proofreading services.

The authors remain grateful to Ken Lay, former vice president and treasurer of the World Bank. He actively supported the first three editions of this publication.

Despite the extent and quality of the input that we have received, we are solely responsible for the content of this publication.

Hennie van Greuning
Sonja Brajovic Bratanovic

Seoul Center for Financial Sector Development

The Seoul Center partnership between the Ministry of Economy and Finance (MOEF) of the Republic of Korea and World Bank Group (WBG) was established in 2011. The objective of the Seoul Center partnership is to "improve and develop financial and private sectors in the East Asia and Pacific (EAP) region by delivering better technical assistance and advisory services to EAP countries" with financing provided by a Korean trust fund. To achieve this objective, the Seoul Center, which is part of the Finance, Competitiveness, and Innovation Global Practice of the WBG, has provided more than 20 grants to support financial sector reforms in EAP countries and has also contributed toward select high-priority initiatives of the WBG (such as this publication).

The partnership provides demand-based customized technical assistance to strengthening financial sector legal, regulatory, and supervisory frameworks; financial integrity; resolution regimes; crisis preparedness; and financial safety nets. Other areas of support include improving access to financial services and strengthening financial infrastructure as well as fostering long-term finance. To enhance the support and enrich global and regional knowledge, the Seoul Center partners with more than 30 Korean financial institutions and stakeholders and has conducted more than 40 knowledge exchanges since starting operations in Korea in 2015. These partnerships help WBG clients learn from Korea's unique development experience and leverage these partners' knowledge, strong capacity, and technical expertise.

Ministry of Economy and Finance
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About the Authors

Hennie van Greuning retired as Senior Advisor in the World Bank Treasury in 2009, having joined the organization in 1994 from the South African Reserve Bank. His last position was as Registrar of Banks (head of banking supervision for the country) and previously as CFO/Financial Manager. Before that, he was a Partner with Deloitte, where he spent 10 years.

Since retiring from the World Bank, he has chaired audit, ethics, and risk committees and served on operational risk and asset-liability management committees of banks. He was on the boards of the FirstRand Banking Group and Bank Islam Brunei Darussalam.

His positions at the World Bank included that of Senior Financial Sector Specialist in the Financial Sector Development Department and Financial Sector Manager in the Europe and Central Asia region.

During his time in the World Bank Treasury unit, he led internal operational risk management initiatives, as well as for Treasury's client advisory services (international reserves management for central banks, international agencies, and sovereign wealth funds); he also consulted on securities accounting policies. He coordinated the World Bank, International Finance Corporation, and International Monetary Fund preparation programs for the Chartered Financial Analyst (CFA) qualification, and he was a frequent speaker on operational risk, IFRS, and financial risk management issues at international conferences. He occasionally continues to consult for the World Bank.

His World Bank publication *International Financial Reporting Standards: A Practical Guide* has appeared in six editions. He has coauthored four editions of *Analyzing Banking Risk* and one edition of *Risk Analysis for Islamic Banks* (2008), as well as *International Financial Statement Analysis* (CFA Institute 2008). His books have been translated into as many as 15 languages.

He majored in accounting at Stellenbosch University and completed a doctorate in economics at the University of Pretoria; he also holds a doctorate in accounting science (UNISA). He qualified as a Chartered Accountant in both South Africa and Canada and is a CFA Charterholder. He has completed an Executive Development Program at Harvard Business School. As part of the World Bank's outreach initiatives, he taught a banking risk course for The George Washington University master's degree program in finance for three years. From 1991 to 1994, he was a Special Professor in Banking Law at the University of Johannesburg (RAU).

Sonja Brajovic Bratanovic joined the World Bank in 1982, after a career in the National Bank of Yugoslavia (NBY), where she began in the Monetary Policy Department, then moved to the Banking Supervision Department, and then became head of the department responsible for the development and technical assistance programs for the central banks of republics (that became the central banks of the seven new countries in 1990s), as part of the NBY Governor's office. Before joining the World Bank, she worked in the Yugoslav Institution for Standardization and Protection of Intellectual Property as principal adviser for international cooperation and as Head of the Department for Standardization of Modern Technologies; she also represented Yugoslavia in the International Organization for Standardization (ISO) and helped to meet the requirements for Yugoslavia to join the General Agreements on Tariffs and Trade/World Trade Organization.

She began her work at the World Bank as section chief of the Financial Systems Division of the Information Resource Management Department, where she was responsible for development of the World Bank's information resource management strategy, as well as the design and development of complex database and information technology software systems. Later, she served as section chief in the Office of Senior Vice President of Finance, responsible for restructuring of the World Bank's cash and liabilities management functions. She was also section chief for the public sector management and private sector development programs in the Middle East and North Africa region.

She was a lead financial sector specialist for the Europe and Central Asia region, leading policy work including financial sector assessment programs, financial and enterprise sector adjustment operations, financial sector infrastructure studies and projects, banking sector studies, and assistance with bank restructuring and banking crisis management. Her work included the design, preparation, and supervision of World Bank operations, including access to finance projects, credit lines, and technical assistance operations.

Since retiring from the World Bank in 2008, she has continued as a consultant to the World Bank and to other international development organizations (such as the Organisation for Economic Co-operation and Development, the Millennium Challenge Corporation (United States), and the European Bank for Reconstruction and Development), in areas such as banking sector studies and financial crisis impact assessments, banking crisis management programs, development programs for financial sector infrastructure, banks' appraisal and bank restructuring program design, and preparation of credit line operations.

She has three postgraduate degrees: in modeling and general systems theory from the University of Belgrade; in computer science and networking from the University of California, Los Angeles; and in economic development and finance from Johns Hopkins University in Baltimore. Her most important publication work has been as coauthor of the four editions of *Analyzing Banking Risk,* published by the World Bank.

Abbreviations

A-IRB	Advanced IRB
ALCO	asset-liability management committee
ALM	asset-liability management
AML	anti-money laundering
AML/CFT	anti-money laundering and combating the financing of terrorism
API	application programming interface
ASF	available stable funding
ATM	automated teller machine
BAU	business as usual
BCBS	Basel Committee on Banking Supervision
BI	business indicator
BIS	Bank for International Settlements
bp	basis point
CAMELS	capital, asset quality, management, earnings, liquidity, and sensitivity to market risk (rating system)
CCF	credit conversion factor
CCR	counterparty credit risk
CDD	customer due diligence
CEBS	Committee of European Banking Supervisors
CFA	chartered financial analyst
CFT	combating the financing of terrorism
COSO	Committee of Sponsoring Organizations of the Treadway Commission
CP	core principle
CPMI	Committee on Payments and Market Infrastructures (BIS)
CRO	chief risk officer
CSRBB	credit spread risk in the banking book

CVA	credit valuation adjustment
DNFBP	Designated Non-Financial Business or Profession
DRC	default risk charge
DV01	dollar value of a basis point
EAD	exposure at default
EBA	European Banking Authority
EL	expected losses
ENISA	European Network and Information Security Agency (European Union Agency for Cybersecurity)
EPFI	Equator Principles Financial Institution
ERM	enterprise risk management
ES	expected shortfall
ETL	expected tail loss
EVE	economic value of equity
FATF	Financial Action Task Force
FINMA	Swiss Financial Market Supervisory Authority
fintech	financial technology
F-IRB	Foundation IRB
FMI	foreign market infrastructure
FRTB	Fundamental Review of the Trading Book
FSAP	financial sector assessment program
FSB	Financial Stability Board
FSI	Financial Stability Institute
FSOC	Financial Stability Oversight Council
FX	foreign exchange
G-7	Group of Seven
GAAP	generally accepted accounting principles
GDP	gross domestic product
GHOS	Governors and Heads of Supervision
G-SIFI	global systemically important financial institutions
HQLA	high-quality liquid assets
IAIS	International Association of Insurance Supervisors
IAS	International Accounting Standards (name changed to IFRS)
IASB	International Accounting Standards Board
ICAAP	internal capital adequacy assessment process
ICFR	internal control over financial reporting
ICT	information and computer technology
IFRS	International Financial Reporting Standards

IMA	internal model approach
IMF	International Monetary Fund
IOSCO	International Organization of Securities Commissions
IRB	internal ratings-based
IRC	incremental risk charge
IRRBB	interest rate risk in the banking book
ISA	International Standards of Auditing
ISO	International Organization for Standardization
IT	information technology
KPI	key performance indicator
KRI	key risk indicator
KYC	Know Your Customer
LCR	liquidity coverage ratio
LGD	loss given default
LIBID	London Interbank Bid Rate
LIBOR	London Interbank Offered Rate
LTV	loan-to-value
M	effective maturity
MAP	minimal acceptable performance
MIS	management information system
NGO	nongovernmental organization
NII	net interest income
NSFR	net stable funding ratio
OECD	Organisation for Economic Co-operation and Development
ORG	Operational Resilience Working Group
P&L	profit and loss
PD	probability of default
PVP	payment versus payment
regtech	regulatory technology
RMU	risk management unit
RRAO	residual risk add-on
RSF	required stable funding
SA	standardized approach
SAA	strategic asset allocation
SBM	sensitivities-based method
SFT	securities financing transaction
SMEs	small and medium enterprises
SMS	short message service

SOX	Sarbanes-Oxley Act
SREP	supervisory review evaluation process
suptech	supervisory technology
SWIFT	Society for Worldwide Interbank Financial Telecommunication
TF	terrorism financing
UCC	unconditionally cancellable commitments
UL	unexpected losses
VAR	value at risk

1

Framework for Risk Analysis

KEY MESSAGES

This publication discusses the assessment, analysis, and management of banking risks, focusing on the following aspects:

- Banks are exposed to financial, operational, and environmental risks.
- A series of key stakeholders (players) are accountable for corporate governance and various dimensions of financial risk management.
- The central components of risk management are the identification, quantification, and monitoring of the risk profile.
- The analysis of banks must consider the current status of a country's financial system.
- Financial sector development encompasses several steps to ensure that institutions operate in a stable and viable macropolicy environment with a solid legal, regulatory, and financial infrastructure.
- Analytical tools provided in this publication include examples of ratios and graphs that provide high-level management information.

1.1 Introduction: Banks in a Changing Environment

This publication provides a comprehensive overview of topics related to the assessment, analysis, and management of banking risks and offers a high-level corporate governance framework aimed at nonspecialist executives. The framework emphasizes the accountability of key players in the corporate governance process in managing different dimensions of financial risk.

Rapid innovation in financial markets and the internationalization of financial flows have changed the face of banking. The new practices are

almost unrecognizable compared with the banking practiced just a few decades ago. Technological progress and deregulation have provided both new opportunities for and increased competitive pressures among banks and nonbanks alike. Margins from traditional banking business began to diminish, and capital adequacy requirements have been increasing constantly. Banks have responded to these new challenges with vigor and imagination by entering new business areas focusing on superior information and knowledge management capabilities.

The growth in international financial markets and a greater diversity of financial instruments have given banks wider access to funds. At the same time, opportunities have arisen to design new products and provide more services. The pace of these changes does not appear to be slowing as banks constantly develop new instruments, products, and services. Traditional banking practice—based on the receipt of deposits and the granting of loans—is today only one part of a typical bank's business.

Today, the major sources of a bank's profitability are information-based activities, such as trading in financial markets and income generation through fees. Financial innovation has also led to the increased market orientation and marketability of bank assets, in particular through securitization and more advanced derivative products.

The introduction of prudential capital requirements, which initially led to a variety of new "off-balance-sheet" financial instruments, was originally considered a prime motivator for such innovation. Financial derivatives (such as guarantees and letters of credit) as well as derivative instruments (such as futures and options) were not always disclosed on the face of balance sheets as assets or liabilities, even though they exposed banks to major risks. Accounting regulators and the International Accounting Standards Board (IASB) have rectified some deficiencies in accounting practices by requiring that all financial instruments be shown on the balance sheets of entities trading in them.

The correlations between different types of risk, both within an individual bank and throughout the banking system, have therefore increased and become more complex. In addition, internationalization and deregulation have increased the possibilities for contagion—as evidenced by the spread of financial crises. In the late 1990s, financial crises spread from Thailand to the rest of Southeast Asia; from the Russian Federation to Eastern Europe; and from Argentina,

Brazil, and Ecuador to the rest of South America. The financial sector crisis originating in 2007 in the United States spread to the European Union and then to the rest of the world. The evolution of banking systems and markets has also raised important macroprudential concerns and monetary policy issues.

Moreover, some instruments are technically complicated and poorly understood—except by a small group of experts who have specialized in their valuation, modeling, and measurement—while many others pose complex problems in terms of technology, accounting, and operational risk management and control.

Although techniques for risk management and measurement have advanced, failures in accurate pricing of asset-backed products have shown that banking is still exposed to failures on a global scale. Despite the efforts of accounting regulators, adequate disclosure of the nature and extent of these risks to shareholders and boards of directors remains at an early, somewhat experimental stage.

These developments have complicated the functions of risk measurement, of risk management, and of integrated approaches to internal controls—but have also increased the need for them. For the individual bank, the new banking environment and increased market volatility have necessitated an integrated approach to asset-liability and risk management techniques. The quality of corporate governance of banks has become a much-debated topic. Hence, authorities have also dramatically changed their approaches to regulation and supervision.

1.2 Types of Bank Exposure to Risk

Banks are subjected to a wide array of risks in the course of their operations. In general, banking risks fall into three categories: financial, operational, and environmental (table 1.1).

Financial risks in turn comprise two types of risk: traditional and treasury. Traditional banking risks—including balance sheet and income statement structure, credit, and solvency risks—can result in loss for a bank if they are not properly managed. Treasury risks, based on financial arbitrage, can result in a profit if the arbitrage is correct or in a loss if it is incorrect. The main categories of treasury risk are liquidity, interest rate, currency, and market (including counterparty) risks.

Table 1.1 Banking Risk Categories

Financial risks	Operational and business risks	Environmental risks
Balance sheet structure	Internal fraud	Country and political risk
Earnings and income statement structure	External fraud	Macroeconomic policy
Capital adequacy	Employment practices and workplace safety	Financial infrastructure
Credit	Clients, products, and business services	Legal and regulatory infrastructure
Liquidity	Damage to physical assets	Banking crisis and contagion
Market	Business disruption and system failures (technology risk)	Reputational risk
Interest rate	Execution, delivery, and process management	Strategic risk
Currency	Outsourcing of key functions	Money laundering ("know your customer" rules)
	Business and market conduct	Cybercrime
	Information governance (data quality)	

Financial risks are also subject to complex interdependencies that may significantly increase a bank's overall risk profile. For example, a bank engaged in the foreign currency business is normally exposed to currency risk, but it will also be exposed to additional liquidity and interest rate risk if the bank carries open positions or mismatches in its forward book.

Operational risks relate to a bank's overall business processes and the potential impact thereon of compliance with bank policies and procedures, internal systems and technology, information security, measures against mismanagement and fraud, and business continuity concerns. Another aspect of operational risk encompasses the bank's strategic planning, governance and organizational structure, management of staff careers and internal resources, product and knowledge development, and customer acquisition approach.

Environmental risks are associated with a bank's business environment, including macroeconomic and policy concerns, legal and regulatory factors, and the overall financial sector infrastructure and payment systems of the jurisdictions in which it operates. Increasingly, money laundering and cybercrime dominate the attention of management. Environmental risks therefore include all types of exogenous risks that, if they were to materialize,

could jeopardize a bank's operations or undermine its ability to continue in business.

1.3 Corporate Governance Stakeholders

As discussed, the liberalization and volatility of financial markets, increased competition, and diversification expose banks to new risks and challenges, requiring continuous innovation in business and risk management to remain competitive. The increasing market orientation of banks has also necessitated changes in their approach to regulation and supervision.

The responsibility for maintenance of the banking system and markets is being redefined, in one country after another, as a partnership between the key stakeholders (players) who manage various dimensions of financial and operational risks. This approach reconfirms that the quality of bank management, and especially the risk management process, are the primary concerns in ensuring the safety and stability of both individual banks and the banking system as a whole. The corporate governance process involves several types of players:

- *Shareholders,* who appoint people in charge of day-to-day corporate governance. Larger shareholders must be approved by regulators to ensure full integrity of the bank's business and risk management.
- *Boards of directors* (independent, nonexecutive, and executive), which set business and risk management strategy, appoint management, and establish operational policies, with systematic control of the bank's financial condition and risk management practices.
- *Executive management,* which is responsible for day-to-day running of the bank within the framework set by performance targets and bank policies. Management should be "fit and proper," having the necessary competence and experience as well as high standards of ethical behavior.
- *Auditors,* including (a) internal auditors who perform an ongoing independent appraisal of the bank's compliance with its procedures, systems, and accounting practices; and (b) external auditors who annually review and evaluate the bank's financial condition and risk management standards.

Chapter 2 provides a detailed analysis of the corporate governance structure, the key stakeholders, and their relationships and responsibilities in the context of a bank's risk management.

1.4 Primary Components of Risk Management

The key risk management objective is to ensure that the bank maintains an appropriate balance between risk and reward. To achieve this overall strategic objective, risk appetite limits and targets are set considering the following:

- *Risk capacity,* which is the absolute maximum level of risk that the bank can technically assume given its available financial resources at a certain point. Risk capacity provides a reference for risk appetite and is not intended to be reached under any circumstances.
- *Risk limits,* which are are clearly defined risk boundaries for different risk types—also referred to as thresholds, tolerances, or triggers.

Risk management normally involves several steps for each type of financial risk and for the overall risk profile: identification of an objective function, setting of risk management targets, and measurement of performance. Also important is the identification and measurement of specific risk exposures in relation to the selected objective function, including assessment of the sensitivity of performance to both expected and unexpected changes in underlying factors. Decisions must also be made on the acceptable degree of risk exposure, the methods and instruments needed to hedge excessive exposure, and the choice and execution of hedging transactions. In addition, the responsibilities for various aspects of risk management must be assigned, the effectiveness of the risk management process assessed, and the competent and diligent execution of responsibilities ensured.

Effective risk management, especially for larger banks and for banks operating in deregulated and competitive markets, requires a formal risk management process. In low- and middle-income economies—especially those in transition—unstable, economically volatile, and shallow market environments significantly expand the range and magnitude of exposure to financial risks. Such conditions render risk management even more complex and make the need for an effective risk management process even more acute. The main components of effective risk management that should be present in a bank and assessed by the analyst normally include the following:

- *An established line function at the highest level* of the bank's management hierarchy that is specifically responsible for managing risk and possibly also for coordinating the operational implementation of the policies and decisions of the asset-liability committee. The risk management function

should be on par with other major functions and be accorded the necessary visibility and leverage within the bank.

- *An established, explicit, and clear risk management strategy* and a related set of policies with corresponding operational targets. Various risk management strategies have originated from different approaches to interpreting interdependencies between risk factors and interpreting differences of opinion concerning the treatment of volatility in risk management.
- *An appropriate degree of formalization and coordination of strategic decision making* in the risk management process. All relevant business and functional processes should incorporate appropriate risk management concerns and parameters for decision making on the operational level. Parameters for the main financial risk factors (normally established according to the bank's risk management policies and often expressed as ratios or limits) can serve as indicators to business units of what constitutes acceptable risk. For example, a debt-to-equity ratio for a bank's borrowers expresses a level of credit risk. Maximum exposure to a single client is a risk parameter that indicates credit risk in a limited form.
- *Rigorous quantitative and qualitative analyses* within applicable risk parameters as a basis for business and portfolio decisions. This process, including analysis of a consolidated risk profile, is necessary because of the complex interdependencies of and need to balance various financial risk factors. Because the risk implications of a bank's financial position and changes to that position are not always obvious, details may be critically important.
- *Systematic gathering of complete, timely, and consistent data* relevant for risk management and provision of adequate data storage and manipulation capacity. Data should cover all functional and business processes as well as other areas such as macroeconomic and market trends that may be relevant to risk management.
- *Development of quantitative modeling tools* to simulate and analyze the effects of changes in economic, business, and market environments on a bank's risk profile and on the bank's liquidity, profitability, and net worth. Banks use computer models ranging from simple, personal computer-based tools to elaborate mainframe modeling systems. Such models can either be built in-house or acquired from other financial institutions with a similar profile, specialized consulting firms, or software vendors. The degree of sophistication and analytical capacity of such models may indicate early on the seriousness of the bank's efforts to manage risk.

1.5 Risk-Based Analysis of Banks

The environment in which banks find themselves not only presents major opportunities for banks but also entails complex, variable risks that challenge traditional approaches to bank management. Consequently, banks must quickly gain financial risk management capabilities to survive in a market-oriented environment, withstand competition by foreign banks, and support private sector-led economic growth.

An external evaluation of a bank's capacity to operate safely and productively in its business environment is normally performed once each year. All annual assessments are similar but have slightly different focuses depending on the purpose of the assessment:

- *Public sector supervisory (regulatory) authorities* assess whether the bank is viable, meets its regulatory requirements, and is sound and capable of fulfilling financial commitments to its depositors and other creditors. Supervisory authorities also verify whether the bank's operations are likely to jeopardize the safety of the banking system as a whole.
- *External auditors,* who should be retained by the bank's board of directors, assess in detail whether the bank's financial statements fairly present its financial position and the results of its operations. In addition, regulatory authorities in many countries require external auditors to assess whether management meets predetermined risk management standards and whether a bank's activities expose its capital to undue risks. Banks are normally required to undergo an external audit that involves at least year-end financial statements and that is considered satisfactory to supervisory authorities.

A bank's financial viability and institutional weaknesses are also evaluated through financial assessments, extended portfolio reviews, or limited assurance review engagements. Such evaluations often occur when a third party evaluates credit risk that the bank poses, for example, in the context of participation in a credit line operation of an international lending agency or receipt of a credit line or loan from a foreign bank; establishment of correspondent banking relationships or access to international markets; equity investment by an international lending agency, private investors, or foreign banks; or inclusion in a bank rehabilitation program.

The bank appraisal process normally includes an assessment of the institution's overall risk profile, financial condition, viability, and future prospects.

The appraisal comprises off- and on-site examinations to the extent considered necessary. If serious institutional weaknesses are found, supervisory authorities may recommend appropriate corrective actions. If the institution is not considered viable in its current condition, supervisory authorities may suggest actions to restore viability or lead to the bank's liquidation and closure. The bank review also assesses whether the institution's condition can be remedied with reasonable assistance or whether it presents a hazard to the banking sector as a whole.

To that end, a bank should be analyzed as both a single entity and on a consolidated basis, considering the exposures of subsidiaries and other related enterprises at home and abroad. A holistic perspective is necessary when assessing a bank on a consolidated basis, especially in the case of institutions that are spread over a number of jurisdictions or foreign markets. A broad framework accommodates variations in the features of specific financial risks in different environments.

A risk-based bank analysis should also indicate whether an individual institution's behavior is in line with peer group trends and industry norms, particularly when it comes to significant issues such as profitability, balance sheet structure, and capital adequacy. A thorough analysis can indicate the nature of and reasons for any deviations. A material change in an individual institution's risk profile could be the result of unique circumstances that have no impact on the banking sector as a whole, or it could be an early indicator of trends that might be followed by other banks.

The conclusions and recommendations of a bank appraisal are typically expressed in a letter to shareholders, in a memorandum of understanding, or as an institutional development program. The most common objective of the latter is to describe priorities for improvement, as identified in the analyst's review, that would yield the greatest benefit to the institution's financial performance. To the extent considered necessary, such recommendations are accompanied by supporting documentation, flowcharts, and other relevant information about current practices. The institutional development program often serves as the basis for discussions between the institution's management, government officials, and international lending agencies, which in turn launch implementation of recommended improvements and decide what technical assistance is needed.

The process of bank analysis also occurs within the context of monetary policy making. Central banks have a mission to maintain a stable currency

and economy. Three interrelated functions are critical to monetary stability: the implementation of monetary policy, the supervision of banks, and monitoring of the payments system. Banking supervision therefore cannot be divorced from the wider mission of monetary authorities. Although central banking policy focuses on the macroeconomic aspects of general equilibrium and price stability, micro considerations of individual banks' liquidity and solvency are key to attaining stability.

1.6 Understanding the Environment in Which Banks Operate

The compilation and analysis of risk management information from banks is a key task of bank supervisors and financial analysts. For bank management, financial analysts, bank supervisors, and monetary authorities, a risk-based analytical review of individual banks' financial data provides information on the banking sector as a whole, highlighting market trends and relationships.

This sectoral analysis is important because it allows norms to be established for the sector as a whole as well as for a peer group within the sector. The performance of individual banking institutions can then be evaluated on the basis of these norms. Deviations from expected trends and relationships may be analyzed further because they may disclose not only the risk faced by individual banks but also changes in the financial environment of the banking sector as a whole. By examining sector statistics, an analyst can gain an understanding of changes in the industry and of the impact of such changes on economic agents and sectors.

Because banks participate in both the domestic and international financial systems and play a key role in national economies, banking statistics can provide an insight into economic conditions. Financial innovation normally results in changes to measured economic variables, and as a result of this dynamism in the financial system, macroeconomists may find their monetary models no longer reflect reality.

The impact of banking activities on monetary statistics—such as money supply figures and credit extension to the domestic private sector—is also of concern to policy makers. Reviews of banks can serve as a structured mechanism to ensure that monetary authorities recognize and quantify nonintermediated funding and lending as well as other processes that are important to policy makers in the central bank. The advantage of a structured approach to evaluating banks is that banking sector behavior is considered systematically

and logically, making sector statistics readily available for macroeconomic monetary analysis. Bank supervisors are thereby able to meaningfully assist monetary authorities whose policies are influenced by developments in the banking sector.

1.7 Financial System Infrastructure

Bank analysis (or appraisal) in a competitive and volatile market environment is a complex process. The assessment of a bank's financial condition and viability normally centers around the analysis of particular aspects, including ownership structure, management competence, risk profile, financial statements, portfolio structure and quality, policies and practices, human resources, and information capacity. To interpret particular findings, estimate future potential, diagnose key issues, and formulate effective and practical courses of action, an analyst must also have thorough knowledge of the particular regulatory, market, and economic environment in which a bank operates. In sum, to do the job well, an analyst must have a holistic view of the financial system.

An environment that includes a poor legal framework, difficulties with the enforcement of financial contracts, or unstable macroeconomic conditions increases credit risk and makes risk management more difficult. For example, an unstable domestic currency that lacks external convertibility presents a high level of risk. A bank's overall business strategy and its specific policies and practices must both accommodate the economic and regulatory environment within which the bank operates and be attuned to market realities.

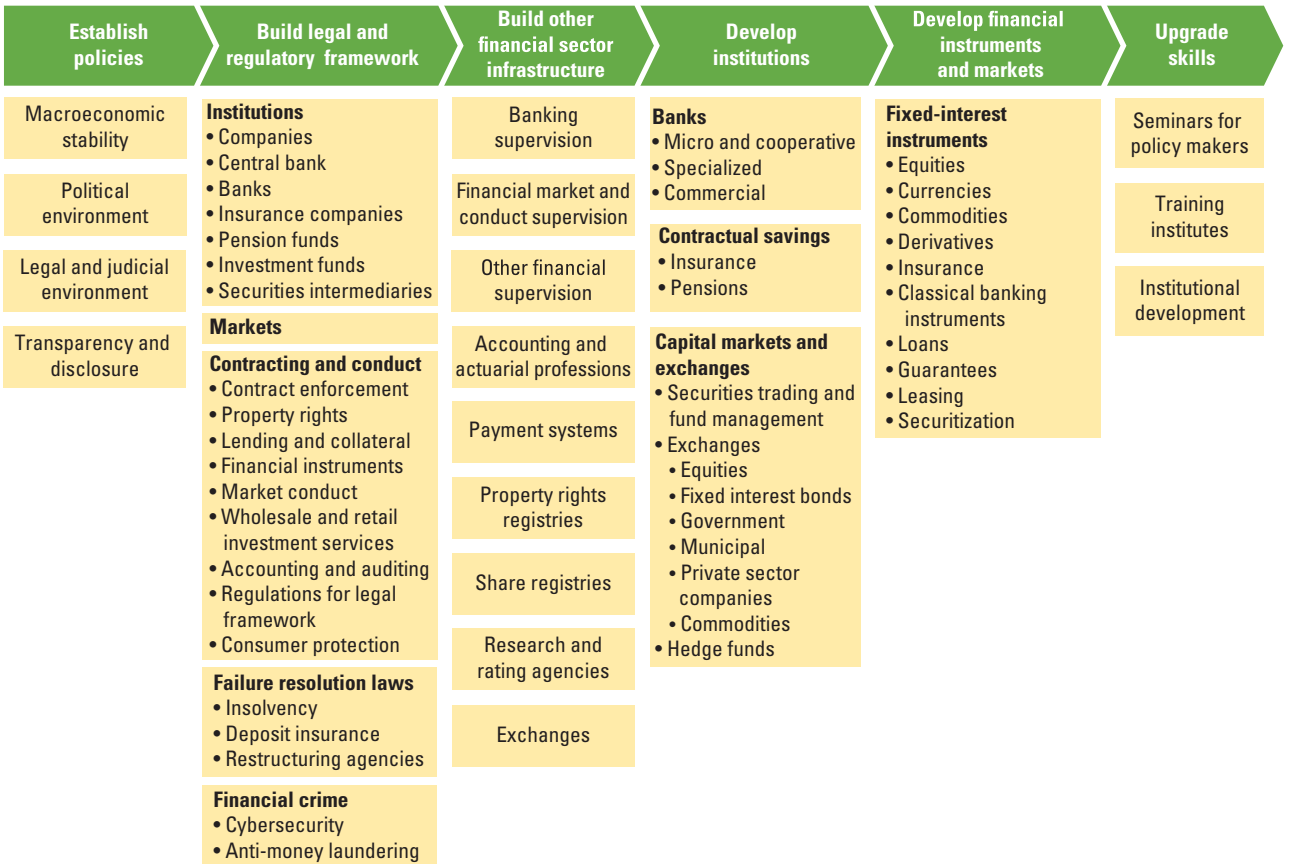
Figure 1.1 illustrates the building blocks of sustainable financial sector development and a context for assessing financial risk and risk management.

Establish Policies

Macroeconomic stability. An unstable macroeconomic environment, with uneven economic performance and volatile exchange rates and asset prices, is a principal cause of instability in the financial system. Such an environment makes the realistic valuation of a bank's assets and the accurate evaluation of financial risks difficult.

Political environment. The political environment is also important because it influences both the principles and the reality under which the financial sector functions. For example, under centrally planned financial systems, markets were greatly limited, and banks—as well as their clients—did not have autonomy.

Figure 1.1 A Framework for Financial Sector Development



Legal and judicial environment. The legal and judicial environments directly affect many aspects of a bank's operations, such as exercising contractual rights to obtain collateral or to liquidate nonpaying borrowers.

Transparency and disclosure. A transparent accountability framework establishes the foundation for a well-functioning business environment for banks and other institutions in the financial sector as well as for their clients.

Build Legal and Regulatory Framework

The legal and regulatory framework for institutions, markets, contracting and conduct, failure resolution, and financial crime spells out the rules of the game for financial institutions and markets. Before appraising a bank, an analyst should understand the conceptual basis for pertinent laws and regulations and assess whether the legal and regulatory framework is complete and consistent. The analyst should be thoroughly familiar with the framework not only because bank operations must comply with it but also because it provides a context for a bank's business (including the objectives and scope of allowed activities) and its risk profile. In addition, knowledge of laws and regulations can prompt measures and actions that can be taken in crisis situations.

Institutions. Key elements of the institutional legal framework of the banking system include the central bank law and the banking law. The former defines the central bank's level of autonomy, systemic and functional responsibilities (which often include prudential supervision), regulatory prerogatives, and enforcement powers. The banking law defines the type of financial intermediation to be performed by banks (for example, universal banking), the scope of banking business in the particular country, conditions of entry and exit from the banking system, and capital and other minimum requirements that must be met and maintained by banks. In addition, the banking law specifies the corporate organization and the relationship between banks and the central bank.

Another important element of the legal and regulatory framework involves prudential regulations issued by the regulatory authorities. The objectives underlying such regulations include maintenance of the safety and stability of the banking system, depositor protection, and the minimal engagement of public funds. The most important prudential regulations include bank licensing, corporate governance, closure and exit mechanisms, capital adequacy, and

financial risk management. Given the trend toward internationalization of banks and the financial markets, the consistency of banking and prudential regulations in various countries is also critical.

Financial risk management regulations (as elaborated from chapter 4 onward) aim to limit a bank's risk exposure, such as through foreign exchange and liquidity. Such measures ensure that a bank has sufficient capital to support its exposure to risk (also known as "capital adequacy requirements") and that it has adequate procedures or systems to assess and hedge against risks, such as asset classification and provisioning procedures as well as value-at-risk models for market price fluctuations.

A legal framework also encompasses other sections of the financial sector through laws pertaining to insurance companies, pension funds, capital market authorities, and the wholesale and retail investment services industry. To protect consumers, a body of laws also exists to regulate contracting and market conduct and behavior.

Failure resolution laws. Other relevant laws relate to failure resolution—for example, insolvency, deposit insurance, and restructuring agencies—and to the technical capacity of the judiciary. The mechanisms for failure resolution and the banking sector safety net are intended to enhance the stability of and confidence in the banking system; however, if they are poorly designed, they can undermine market discipline.

Elements of the banking safety net include the "lender of last resort" function and deposit insurance facilities. The specific form of a banking safety net has significant implications for risk management. For example, the existence of "lender of last resort" facilities—the main purpose of which is to provide temporary liquidity support to illiquid but solvent institutions—may weaken risk management incentives for banks, which tend to maintain less liquidity and lend more when these facilities are in place. Likewise, the existence of deposit insurance, especially where the cost is underwritten by the state, may engender situations of moral hazard, such as the automatic bailout of banks, regardless of the quality of corporate governance or the status of financial risk management.

Financial crime. One reality of a changing banking environment is the increased burden on banks to monitor financial crimes such as cybersecurity and money laundering. These aspects will be addressed in chapter 14 (operational risk management).

1.8 Build Other Financial Sector Infrastructure

Financial sector infrastructure strongly influences the quality of bank operations and risk management, such as through the channels shown below.

Payment systems. The payment system—a key element of financial sector infrastructure—may be organized and managed by the central bank, by members of the banking system, or as an arrangement between individual banks and the central bank. The specific organization of the payment system determines the mechanisms for payment transactions. An inefficient payment system can result in significant cost and settlement risk to the banks.

Accounting and actuarial professions. Infrastructure also encompasses various professions that are central to the financial sector, such as accounting and auditing, the actuarial profession, and investment advising. Adherence to international standards of accounting and auditing, coupled with a well-trained cadre of professionals in these fields, can make a significant difference to the fairness and transparency of financial statements. Fair, transparent statements greatly facilitate risk management, bank supervision, and consumer protection.

Property rights and share registries. Property registries are also a part of risk management infrastructure. Such registers define fixed and movable assets and marketable securities and effectively protect property rights. They also facilitate the registration and collection of collateral and subsequent credit risk management. Risk reference registers serve the same purpose through the collection and maintenance of information on the credit histories of individuals and firms, which are readily distributed to interested parties.

Research and rating agencies. In addition, ratings agencies help with risk management by systematically researching banks, companies, and markets and making findings available to both financial professionals and the general public. In many countries, the financial infrastructure may also include research institutes, financial advisory services, and similar establishments.

Exchanges. The core function of an exchange is to enable transparent trading of various financial instruments, including securities, derivatives, commodities, and other financial instruments. Exchanges are used by governments, investment funds, banks, various business entities, and individual investors. Key challenges involve the efficient dissemination of available instruments and the related prices as well as provisions to ensure good

order and fair trading. New options presented by information technology are increasingly used, and electronic exchanges are becoming a dominant financial trading option.

Develop Institutions

The institutionalization of the financial system includes forms and rules under which a particular financial institution can be incorporated and, on a broader scale, identifies its potential competitors. Increased competition in banking and finance and the trend toward homogenization of banking business have been major factors that influence changes in national banking systems.

Banks. The concept of universal banking and the reality of financial markets have, however, increasingly blurred the lines between various institutions. In the context of risk management, the structure and concentration of ownership are key. A banking system dominated by state-owned banks or financial institutions is prone to moral hazard situations, such as implicit guarantees, and tends to have competitive distortions in its markets. A high concentration of ownership or assets also increases risk by subjecting the system to political pressures, because some banks are considered by government entities to be "too big to fail" and may therefore be artificially supported. In exceptional cases where systemic risk is at stake, a supervisory authority may choose to support the too-big-to-fail approach. In addition, the absence of foreign ownership typically indicates closed and inefficient financial markets.

Contractual savings institutions. Contractual savings are long-term savings based on certain types of agreement, typically with a financial institution, including those based on defined contribution plans and defined benefit plans. Examples of contractual savings institutions include national provident funds, life insurance companies, and different types of pension funds. Personal pension plans—managed by different types of institutions (commercial and savings banks, life insurance companies, or pension fund administrators)—are another example of long-term contractual savings. Contractual savings institutions also provide investment and professional management services, with benefits for individual savers including economies of scale, risk diversification, and better stability.

Capital markets and exchanges. Capital markets refer to markets or exchanges where financial instruments (such as bonds, derivatives, and commodities) are bought and sold, as follows:

- *The primary market* deals with the issuance and sale of equity-backed securities to investors directly by the issuer. For example, companies, governments, or public sector institutions can raise funds by issuing bonds, and corporations can sell new stock through an initial public offering (also through investment bank or securities dealers).
- *The secondary market* is the part of the market where previously issued financial instruments (such as bonds, stocks, futures, and options) are bought and sold. Secondary markets range from illiquid to very liquid and from fragmented to centralized. The major stock exchanges are the most visible example of liquid secondary markets for stocks of publicly traded companies.
- *The third market* refers to trading of exchange-listed securities in the over-the-counter (OTC) market. Third market trading allows investors to trade blocks of securities directly rather than through an exchange, providing liquidity and anonymity to buyers.

Develop Financial Markets and Instruments

The financial instruments and markets category of figure 1.1 depicts the markets operating in the financial system, their modi operandi, and the terms of their operations. As mentioned earlier, modern banks have moved beyond traditional deposit and credit markets to establish a direct presence in practically all aspects of the financial system. Originally established as specialized institutions, banks have sought new customers in wider geographical areas and have come to offer increasingly similar types of accounts, credit, and financial services.

In addition to more intense competition among the different types of banks, the number and diversity of nonbank financial intermediaries have also increased. As a result, effective substitutes for banking products now exist, and a broader range of services is available. The threat that nonbanking institutions will expand into banking services has likely been another stimulus for banks to adopt market-oriented behavior. Secondary markets have also grown in importance, which has reduced market segmentation and created more uniform cost structures for different financial institutions.

Each type of market deals with specific financial products. Innovation has brought about a greater variety of financial instruments, the respective markets of which are continuously increasing. In financial risk management terms,

the understanding of the risk involved in key products offered by a bank and of the implications of specific markets—for example, in terms of liquidity or price stability—is key to being able to adequately appraise a bank.

Upgrade Skills

Finally, the availability and quality of banking skills is a central concern in the risk-based appraisal of banks. It is essential that banks have good personnel management and can systematically develop banking skills within their organizations. A good bank should be able to acquire the appropriate skills and develop a suitable work culture. It should also have a process to optimize the mix of staff skills and experience and to develop staff performance levels in concert with its business and institutional goals.

2

Corporate Governance

KEY MESSAGES

- Strong corporate governance is the foundation of good risk management.
- Corporate governance is defined by relationships between a bank's management, its board of directors, risk and other committees, its shareholders, and other stakeholders.
- Good corporate governance provides a disciplined structure through which a bank sets its objectives and the means of attaining them, as well as monitoring the performance to achieve those objectives.
- Ethics provides a basis for good governance. Governance without proper ethics lacks foundation. Governance without independence of board members also lacks foundation.
- Financial risk management is the responsibility of several key stakeholders or players in the corporate governance structure. Each key stakeholder is accountable for some dimension of risk management. The board of directors takes overall responsibility for risk oversight.
- The key stakeholders are regulators or supervisors, shareholders, directors, executive managers, internal auditors, external auditors, and the general public.
- Risk control is exercised through three lines of defense: management, the risk management function, and internal audit.
- Governance is affected by the relationships between participants in the governance system. To the extent that any key player does not, or is not expected to, fulfill its function in the risk management chain, other key stakeholders must compensate for the gap by enhancing their own roles. The bank supervisor may have to step into the vacuum created by the failure of certain stakeholders.

2.1 Corporate Governance Principles

Corporate governance relates to the manner in which the business of the bank is governed. It is defined by a set of relationships between the bank's management, its independent board, its shareholders, and other stakeholders. This includes setting corporate objectives and a bank's risk profile;

aligning corporate activities and behaviors with the expectation that management will operate the bank in a safe and sound manner; and running day-to-day operations within an established risk profile and in compliance with applicable laws and regulations while also protecting the interests of depositors and other stakeholders.

Effective, independent governance practices are among the key prerequisites to achieving and maintaining public trust and, more broadly, confidence in the banking system. Poor governance increases the likelihood of bank failures. Bank failures may impose significant public cost, affect deposit insurance schemes, and increase contagion risks.

Banks and banking may affect the welfare of a significant percentage of the world's population. Banks' corporate governance arrangements, therefore, can influence economic development. Sound corporate governance can create an enabling environment that rewards banking efficiency, mitigates financial risks, and increases systemic stability. Lenders and other providers of funds are more likely to extend financing when they feel comfortable with the corporate governance arrangements of the funds' recipient and with the clarity and enforceability of creditor rights. Good corporate governance also tends to lower the cost of capital because it conveys a sense of lower risk that translates into shareholders' readiness to accept lower returns. Good corporate governance has been shown to improve operational performance and reduce the risks of contagion from financial distress. Besides mitigating the internal risk of distress by positively affecting investors' perception of risk and their readiness to extend funding, good governance increases firms' robustness and resilience to external shocks.

Most major banking centers have adopted corporate governance guidelines, and the consensus appears to be that the key elements of a sound corporate governance framework in a bank include the following:

- *A well-articulated corporate and risk management strategy* against which the overall success and the contribution of individuals can be measured
- *Clear assignment and enforcement of responsibilities,* decision-making authority, and accountabilities appropriate for the bank's selected risk profile
- *Strong financial risk management functions* (independent of business lines), adequate internal control systems (including internal and external audit functions), and functional process design with the necessary checks and balances
- *Adequate corporate values, codes of conduct, and other standards of appropriate behavior* as well as effective systems to ensure compliance,

including special monitoring of the bank's risk exposures where conflicts of interest are expected to appear (for example, relationships with affiliated parties)

- *Financial and managerial incentives to act appropriately* offered to the board, management, and employees, including compensation, promotion, and penalties (that is, compensation consistent with the bank's objectives, performance, and ethical values)
- *Transparency and appropriate information flows* internally and to the public.

The remainder of this chapter discusses initiatives in setting the principles for a good governance process. It then discusses the roles and responsibilities of key stakeholders or players in a bank's corporate governance process. It reviews the roles of stakeholders directly involved in corporate governance and risk management, as well as the responsibilities of other parties who determine the regulatory and public policy environment within which a bank operates and who have a major influence on risk management. The activities of third parties, such as bank customers and market participants, are also mentioned.

2.2 Major Developments in Corporate Governance Principles

National authorities have been paying increasing attention to corporate governance (and the independence of various parties involved), as are institutions engaged in international trade, financial flows, and protecting the stability of international markets (for example, the Organisation for Economic Co-operation and Development [OECD], the Bank for International Settlements, the International Monetary Fund [IMF], and the World Bank). This attention can be attributed to several factors:

- *The growth of institutional investors* (such as pension funds, insurance companies, mutual funds, and highly leveraged institutions) and their role in the financial sector, especially in major industrial economies
- *Widely articulated concerns and criticism* that the monitoring and control of publicly held corporations is often defective, leading to suboptimal economic and social development
- *The shift away from a traditional view of corporate governance* as centered on "shareholder value" in favor of a corporate governance expected to effectively address concerns of a wide circle of stakeholders

- *The impact of increased globalization of financial markets*, a global trend toward deregulation of financial sectors, and liberalization of institutional investors' activities.

International organizations and country authorities have declared strong, independent governance to be a priority and have taken initiatives to define the key benchmarks for good governance and related topics. Since the initial publication of such declarations and initiatives (as discussed below), corporate governance issues have continued to attract considerable national and international attention in light of high-profile breakdowns in corporate governance, as evidenced in regional financial crises of 1997–98 and the global financial crisis of 2007–09. Consequently, improved versions of these documents have been published at regular intervals.

Annex 2A summarizes some of the key international and national initiatives that have set the stage or otherwise affected the regulatory framework and governance practices in both banks and nonbank financial institutions worldwide. It also discusses in further detail the international and national initiatives to improve various corporate governance aspects.

Basel Committee Guidance on Corporate Governance

The Basel Committee on Banking Supervision (BCBS, or Basel Committee) is the primary global standard setter for the prudential regulation of banks and provides a forum for regular cooperation on banking supervisory matters and improvements of banks' practices. It aims to encourage convergence toward common approaches and standards that would enhance financial stability of world markets.

Aware of the critical importance of bank governance, the BCBS originally published a guidance paper in 1999 (updated in 2015) to assist banking regulators and supervisors in promoting the adoption of sound corporate governance principles and practices (BCBS 1999, 2015). This guidance drew from corporate governance principles that the OECD had published earlier in 1999 to assist member countries in their efforts to evaluate and improve their corporate governance frameworks (OECD 1999).

The leading concept of the BCBS's governance principles (box 2.1) is that sound governance can be achieved regardless of the form used by a banking organization, provided that several essential functions are in place.

BOX 2.1 The Basel Committee's Corporate Governance Principles for Banking Organizations

Principle 1: Board's overall responsibilities. The board has overall responsibility for the bank, including approving and overseeing management's implementation of the bank's strategic objectives, governance framework, and corporate culture.

Principle 2: Board qualifications and composition. Board members should be and remain qualified, individually and collectively, for their positions. They should understand their oversight and corporate governance role and be able to exercise sound, objective judgment about the affairs of the bank.

Principle 3: Board's own structure and practices. The board should define appropriate governance structures and practices for its own work and put in place the means for such practices to be followed and periodically reviewed for ongoing effectiveness.

Principle 4: Senior management. Under the direction and oversight of the board, senior management should carry out and manage the bank's activities in a manner consistent with the business strategy, risk appetite, remuneration, and other policies approved by the board.

Principle 5: Governance of group structures. In a group structure, the board of the parent company has the overall responsibility for the group and for ensuring the establishment and operation of a clear governance framework appropriate to the structure, business, and risks of the group and its entities.[a] The board and senior management should know and understand the bank group's organizational structure and the risks that it poses.

Principle 6: Risk management function. Banks should have an effective independent risk management function, under the direction of a chief risk officer (CRO), with sufficient stature, independence, resources, and access to the board.

Principle 7: Risk identification, monitoring, and controlling. Risks should be identified, monitored, and controlled on an ongoing bankwide and individual entity basis. The sophistication of the bank's risk management and internal control infrastructure should keep pace with changes to the bank's risk profile, to the external risk landscape, and the industry practices.

Principle 8: Risk communication. An effective risk governance framework requires robust communication within the bank about risk, both across the organization and through reporting to the board and senior management.

BOX 2.1 The Basel Committee's Corporate Governance Principles for Banking Organizations *(Continued)*

Principle 9: Compliance. The bank's board of directors is responsible for overseeing the management of the bank's compliance risk. The board should establish a compliance function and approve the bank's policies and processes for identifying, assessing, monitoring and reporting, and advising on compliance risk.

Principle 10: Internal audit. The internal audit function should provide independent assurance to the board and should support board and senior management in promoting an effective governance process and the long-term soundness of the bank.

Principle 11: Compensation. The bank's remuneration structure should support sound corporate governance and risk management.

Principle 12: Disclosure and transparency. The governance of the bank should be adequately transparent to its shareholders, depositors, other relevant stakeholders and market participants.

Principle 13: The role of supervisors. Supervisors should provide guidance for and supervise corporate governance at banks, including through comprehensive evaluations and regular interaction with boards and senior management; should require improvement and remedial action as necessary; and should share information on corporate governance with other supervisors.

Source: BCBS 2015.

a. Banks that are part of a conglomerate should also consider the Joint Forum's *Principles for the Supervision of Financial Conglomerates* (Joint Forum 2012). For the purposes of the corporate governance principles herein, the terms "parent company" and "group" signify a financial group.

Four important forms of oversight should be included in the organizational structure of any bank to ensure appropriate checks and balances (BCBS 2015):

- Oversight by the board of directors or supervisory board
- Oversight by individuals not involved in the day-to-day running of the various business areas
- Direct line supervision of all business areas
- Independent risk management, compliance, and audit functions.

In addition, it is important that key personnel be "fit and proper" for their positions—a standard further discussed later in this chapter.

Supervisors have a keen interest in sound corporate governance, as it is an essential element in the safe and sound functioning of a bank and may affect the bank's risk profile if not implemented effectively. Because the functions of the board of directors and senior management regarding setting policies, implementing policies, and monitoring compliance are key elements in a bank's control functions, effective oversight of a bank's business and affairs by its board and senior management contributes to the maintenance of an efficient and cost-effective supervisory system.

The implementation of the governance principles set forth by the BCBS should be proportionate to the size, complexity, structure, economic significance, and risk profile of the bank and the group (if any) to which it belongs. The application of corporate governance standards in any jurisdiction will depend on relevant laws, regulations, codes, and supervisory expectations.

Bank Governance: Key Players and Partnerships

The players directly involved in corporate governance and risk management include

- Parties who determine the regulatory and public policy environment within which a bank operates;
- Parties who are directly responsible for bank business strategy, operation, and risk management; and
- Banking markets-related parties such as bank customers and market participants.

Tables 2.1 and 2.2 summarize the responsibilities and importance of these three categories.

Partnership in Corporate Governance of Banks

Governance is affected by the relationships between participants in the governance system. To the extent that any key player does not, or is not expected to, fulfill its function in the risk management chain, other key stakeholders must compensate for the gap by enhancing their own roles.

Table 2.1 Importance of Key Player Responsibilities in Corporate Governance

Key players	Responsibility	Importance	
		Policy level	Operational level
Systemic roles			
Legal and regulatory authorities	Set stage	Critical	n.a.
Bank supervisors	Monitor	Indirect (monitoring)	Indirect
Institutional roles			
Shareholders	Appoint key players	Indirect	Indirect
Board of directors	• Set business and risk management policies • Monitor effects • Approve any changes	Critical	Important
Executive management	• Implement policies and strategies • Manage day-to-day operations	Critical	Critical
Audit committee and internal audit	Test compliance with bank policies regarding corporate governance, risk management processes, and control systems	Indirect (compliance)	Critical
External roles			
External auditors	Evaluate and express opinion	Indirect (evaluation)	Very important
Outside stakeholders and public	Act responsibly	n.a.	Indirect

Note: n.a. = not applicable.

Given the number of aspects to be addressed and the wealth of information that has become available, it is clear that corporate governance can only be effective if supported by a "partnership" between the key stakeholders in the governance process. No single stakeholder can take responsibility for achieving the entire chain of processes required for good governance.

Table 2.2 portrays a *risk management partnership* in which each key player has a clearly defined accountability for a specific dimension of every risk area.

Table 2.2 Responsibilities of Key Players in Partnership for Corporate Governance and Risk Management of Banks

Key players	Financial and other risk management areas									
	Balance sheet structure	Income statement structure and profitability	Capital adequacy and stress tests	Credit risk	Liquidity risk	Market risk	Interest rate risk	Currency risk	Operational risk	Environmental risk
	Accountability (dimension of risk for which key player is responsible)									
Systemic key players										
Legal and regulatory authorities	Set regulatory framework, including risk exposure limits and other risk management parameters, that will optimize risk management in the banking sector									
Supervisory authorities	Monitor financial viability and effectiveness of risk management; check compliance with regulations									
Institutional key players										
Shareholders	Appoint "fit and proper" boards, management, and auditors									
Board of directors	Set risk management and other bank policies; assume ultimate responsibility for the entity									
Ethics committee	Establish clear tone at the top									
First line of defense: Executive management	Design processes and controls to implement board policies, including risk management, in day-to-day operations									
Second line of defense: Risk committee and risk management function	Evaluate the design of risk management processes and assess risk to which the institution is exposed									

continued

Table 2.2 Continued

Key players	Financial and other risk management areas									
	Balance sheet structure	Income statement structure and profitability	Capital adequacy and stress tests	Credit risk	Liquidity risk	Market risk	Interest rate risk	Currency risk	Operational risk	Environmental risk
	Accountability (dimension of risk for which key player is responsible)									
Institutional key players										
Third line of defense: Audit committee or internal audit	Evaluate the operating effectiveness of the control environment and adequacy of financial disclosure									
External auditors	Express opinion on the fairness of financial presentation									
Public and consumer key players										
Investors and depositors	Understand responsibility and insist on full disclosure; take responsibility for own decisions									
Ratings agencies	Insist on transparency and full disclosure and focus on ability to repay depositors and service debt									
Media	Inform the public (keep banks honest)									
Analysts	Analyze quantitative and nonquantitative risk-based information and advise clients									

2.3 Ethics: The Basis for Good Governance

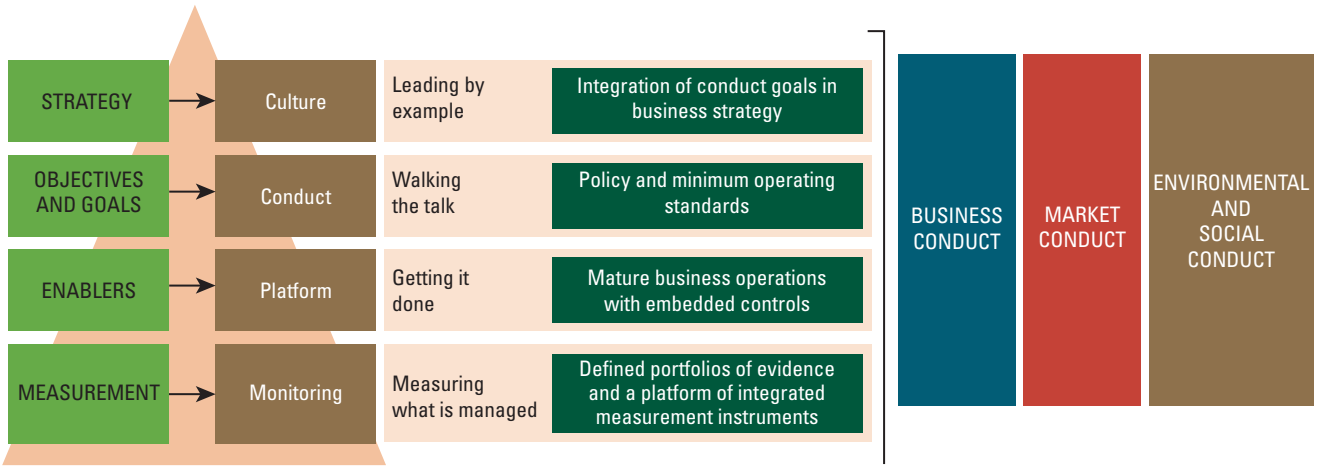
The importance of good ethics in banks and other financial services organizations cannot be overemphasized. As a qualitative concept, ethics has a significant influence on human behavior and thus on operational risk. The emphasis on ethics and integrity is not new. As far back as 1928, the Louisiana Bankers' Association adopted a code of ethics, defining why ethics is of key importance in the governance process ensuring trust and stability.

Recent international and national corporate governance initiatives specifically address the importance of ethical behavior—including initiatives of the Financial Stability Board (FSB), BCBS, OECD, and national agencies in the European Union, South Africa, United Kingdom, United States, and elsewhere. In 2015, the G-7 group of wealthy nations announced an effort to develop a common set of ethical standards that would apply to all bankers, regardless of the country in which they do business (Black and Buergin 2015). The key point in these efforts is that postcrisis regulation must get bankers to move beyond corporate "rules-based" behavior to what former IMF Managing Director Christine Lagarde has referred to as "values-based" behavior and a greater focus on promoting individual integrity (Lagarde 2015). However, the idea that bankers' ethical obligations might be harmonized across the world is a challenge given that, no matter how cosmopolitan one's view, different cultures might approach foundational questions of financial ethics in different ways.

In 2015, the BCBS, also an FSB member, issued its revised *Guidelines: Corporate Governance Principles for Banks*, principally to stress the importance of banks' adoption of ethical norms, primarily to reduce risk. The guidelines stressed that "a fundamental component of good governance is a corporate culture of reinforcing appropriate norms for responsible and ethical behavior . . . especially . . . risk awareness" and an adequate "culture of honesty and accountability to protect the interest of its customers and shareholders" (BCBS 2015).

The BCBS also concluded, "The board should set the 'tone at the top' and oversee management's role in fostering and maintaining a sound corporate and risk culture." An innovative way of integrating ethics, culture, and conduct encompasses several interdependent components (figure 2.1):

Figure 2.1 Ethics: Integrating Culture, Conduct, Business Platforms, and Compliance



Source: FirstRand 2016.

Note: The model was developed by Willem Punt, former chief ethics officer, FirstRand Bank, and approved by the FirstRand Social and Ethics Committee.

- *Culture:* Any organization's ethics is informed by how its leaders behave—in other words, the *tone at the top* sets the culture and ideals for the organization.
- *Conduct:* Conduct is the translation of those ideals into action—*walking the talk*. Conduct encompasses business conduct, market conduct, and social or environmental conduct.
- *Platform:* Where many organizations fail is that their business platforms (not only systems but also processes) cannot effectively ensure that their conduct ideals are automatically transformed into workflows.
- *Monitoring:* If the platforms could evolve into playing this role in future, monitoring compliance would become the outcome of an ethical culture and conduct.

To this end, regulatory compliance resources at banks are particularly important. Large banks "are expected to have in place the corporate governance structure and practices commensurate with their role in and potential impact on national and global financial stability," including a code of ethics to ensure that their employees knew that they were "expected to conduct themselves ethically," including "complying with applicable laws" (BCBS 2015).

Ethical standards should be institutionalized through appropriate strategic and managerial interventions and included when defining the procedures for compliance, corporate governance, and enterprise risk management. Professional organizations around the world have been publishing codes of ethical conduct since the early 1970s—a practice that gained momentum in the 1990s. (The CFA Institute, which offers the chartered financial analyst [CFA] designation, has made the ethics component a key element of its qualification.) Generally, the following aspects are emphasized by most professional organizations:

- *Professional competence,* including the knowledge, skills, and experience to do the job correctly
- *Professionalism,* a standard of professional behavior that is above scrutiny
- *Integrity standards,* including honesty and professional conduct in all circumstances
- *Independence and objectivity,* which involve maintaining fiduciary responsibility, seeking effective and objective solutions, and doing the job and providing advice based on that objectivity
- *Confidentiality,* particularly to keep information confidential
- *Conflicts-of-interest management,* ensuring that the work and decisions do not create conflict-of-interest situations and—most importantly—place clients' interests first.

2.4 Regulatory and Supervisory Authorities: Establishing a Risk-Based Framework

Regulation of banks in the past referred to the establishment and approval of banking law. *Supervision* of banks referred to the monitoring of bank financial conditions and risk management. However, nowadays these terms are used interchangeably. Countries use different organizational structures for regulation and supervision—sometimes separating regulation from supervision and housing the regulatory function in a ministry and the supervisory function in the central bank or an independent financial markets authority. In some instances, the term "regulators" also includes the supervision responsibility.

The primary role of bank regulators and supervisors is to facilitate the process of risk management and to enhance and monitor the statutory framework for risk management. Bank regulators and supervisors cannot prevent bank failures. However, by creating a sound, enabling environment, they have a crucial role to play in influencing the other key stakeholders.

Regulatory Authorities: Designing Conditions for Risk Management

A regulatory framework consists of more than just regulations designed to meet specific objectives. The regulatory environment embodies a general philosophy and principles that guide both the content and the implementation of specific regulations.

In general, regulators may take either a prescriptive or a market-oriented approach to their task. This choice is determined by the regulator's understanding of the philosophical underpinnings of the economy as a whole. In practice, regulations in most high-income countries combine both a prescriptive approach and a market-oriented approach, leaning one way or another depending on individual circumstances.

A *prescriptive regulatory approach* usually limits the scope of activities of financial institutions; it often results in regulations for all risks known to the regulators. The danger of such an approach is that regulations quickly become outdated and cannot address the risks stemming from financial innovation.

In contrast, bank regulators that subscribe to a *market-oriented regulatory approach* believe that markets, by definition, function effectively, are capable of managing the related financial risks, and should therefore be allowed to operate as freely as possible. With a market-oriented approach, the regulator's

role is focused on facilitating the improvement of risk management. The regulator and the regulated entity should agree on common objectives to ensure an efficient and effective process. In other words, when designing regulations, the regulator should consider the views of market participants to avoid impractical or ineffective regulations.

In the new millennium, the shift toward a market-oriented approach accelerated, although the 2007–09 global financial crisis tempered some of these advances. Market-oriented regulations address a broad spectrum of risks and provide principles on how to assess and manage risk without unnecessarily detailed rules and recommendations. In addition, because it is based on principles rather than rules, a market-oriented approach can adapt to changing market conditions. Regulators should therefore concentrate on creating an environment that optimizes the quality and effectiveness of risk management and should oversee the risk management process exercised by the boards and management personnel of individual banking institutions.

At the system level, regulators' efforts are typically focused on maintaining public confidence in the banking sector and on creating an equitable market for financial institutions and providers of financial services. Regulators also aim to establish a free-market attitude toward bank supervision and professional supervisory functions, as well as to facilitate public understanding of the bank management's responsibility in the risk management process.

In terms of financial risk management, regulators' responsibilities center around

- *Improving quality at entry* through strict licensing and minimum capital requirements and capital adequacy rules;
- *Toughening fiduciary responsibilities and standards* regarding bank owners, directors, and management personnel;
- *Providing guidelines* on risk management and related policies;
- *Setting statutory guidelines* with respect to risk positions; and
- *Evaluating compliance and overall risk management* in a bank or banking system.

Most regulators also conduct research on the latest developments in the field of risk management.

Because regulators are best positioned to act in the interest of depositors, they should maintain a flexible legal framework and move swiftly and decisively when banking problems are identified. For example, the legal framework in the United States establishes several grounds for

intervention by regulatory authorities. These include critical undercapitalization or expected losses great enough to deplete capital, insufficient assets or the inability to meet obligations, substantial dissipation of assets, unsafe and unsound conditions, concealment of books and records, misuse of managerial position, and violation of the law.

Once consensus has been reached that a problem exists that bank management cannot effectively address, the typical recourse has been the removal of responsible managers and directors; fines; and, where fraud is involved, criminal prosecution. Unfortunately, situations also arise in which regulators fail to identify problems at an early stage, sometimes as a result of unfavorable laws. Other factors include the highly technical nature of financial machinations, undue political influence, or even corruption because of the large profits or losses at stake. Fraud may also span institutions supervised by multiple regulatory authorities.

Supervisory Authorities: Monitoring Risk Management

Bank supervision is sometimes applied incorrectly as a legal or administrative function focused largely on regulations related to the business of banking. Such regulations are often prescriptive in nature and impose onerous requirements on banks, which seek to circumvent them by developing innovative products.

Once regulators and supervisors understand that they cannot bear sole responsibility for preventing bank failures, they need to identify clearly what they are capable of achieving and then focus on that specific mission. This process has already taken place in most high-income countries. More and more, the role of a bank's supervisory authority is moving away from monitoring compliance with banking laws and old-style prudential regulations. A more appropriate mission statement today would be as follows: "To create a regulatory and legal environment in which the quality and effectiveness of bank risk management can be optimized to contribute to a sound and reliable banking system."

Because transactions of large banks are extremely complex and therefore hard to trace and evaluate, supervisors depend to a substantial degree on internal risk management and internal control systems. The traditional approach to regulation and supervision has at times caused distortions in financial markets by providing negative incentives for the evasion of regulations rather than encouraging the adequate management of financial risk. In some jurisdictions, this realization has laid the groundwork for an extensive process of consultation

between regulators and banks seeking to establish the legal framework for a shift to a market-oriented, risk-based approach to bank supervision. To establish such a framework, the responsibilities of the different stakeholders in the risk management process have to be clearly delineated.

The task of bank supervision becomes monitoring, evaluating, and, when necessary, strengthening the risk management process that is undertaken by banks. However, the supervisory authority is only one of the many contributors to a stable banking system. Other stakeholders also are responsible for managing risk, and prudential regulations increasingly stress the accountability of top-level management. Many countries—recognizing the high cost of voluminous reporting requirements without corresponding benefits—are moving toward a system of reporting that encourages and enables supervisors to rely more extensively on external auditors in the ordinary course of business, subject to having a clear understanding of their role in the risk management chain.

The Basel II and III capital standards discussed in chapter 6 have introduced three pillars whereby the market discipline is evaluated by external parties (such as rating agencies and external auditors). The move toward shared responsibilities started in the 1990s, with New Zealand being one of the first examples of the new philosophy.

However, regulators should not imply that they take responsibility for banks' risk management actions, said Don Brash during his tenure as governor of the Reserve Bank of New Zealand (Brash 1997):

> A further concern we have with on-site examinations or the off-site collection of detailed private information on banks, at least in the New Zealand context, is the risk that these approaches can blur the lines of responsibility for the management of banks. If the banking supervisor has responsibility for regular on-site examinations, it presumably follows that the supervisor also has responsibility for encouraging or requiring a bank to modify its risk positions or make other adjustments to its balance sheet where the supervisor has concerns in relation to the bank's risk profile. *This has the potential to erode the incentives for the directors and management of banks to take ultimate responsibility for the management of banking risks, effectively passing some of this responsibility to the banking supervisor.* It also has the potential to create public perceptions that the responsibility for the banking risks is effectively shared between a bank's directors and the banking supervisors. In turn, this makes it very difficult indeed for a government to eschew responsibility for rescuing a bank in difficulty. . . . I acknowledge that any system of banking supervision creates a risk for the taxpayer in the event that a bank gets into difficulty. However, in order to minimize these risks, the Reserve Bank of New Zealand prefers to keep the spotlight clearly focused on the directors and management of a bank, rather than risk a further blurring of their accountability.

A related, and important, development has been the toughening of public information disclosure requirements to help the public monitor banking activities as well. The new approach to banking regulation and supervision also corresponds, in its essential elements, to the traditional style of regulation and supervision of nonbank financial intermediaries, thereby helping to make the regulatory environment for financial institutions more consistent and homogenous. Arguably, these changes have occurred in reaction to and as an inevitable consequence of the increasing lack of distinctions between banks and nonbanking financial intermediaries.

The *Core Principles for Effective Banking Supervision* are the de facto minimum standard for sound prudential regulation and supervision of banks and banking systems. Originally issued by the BCBS in 1997 and updated in 2006 and 2012, they are used by countries as a benchmark for assessing the quality of their supervisory systems and for identifying future work to achieve a baseline level of sound supervisory practices. More details on risk-based approaches to bank supervision are discussed in chapter 17.

2.5 The Shareholders: Appointing the Right Policy Makers

Shareholders play a key role in the promotion of corporate governance. By electing the supervisory board and approving the board of directors, the audit committee, and external auditors, shareholders are in a position to determine a bank's business strategy and direction. Banks are different from other companies: the responsibilities of management and the board are not only to shareholders but also to depositors, who provide leverage to owners' capital. Depositors are different from normal trade creditors because the entire intermediation function in the economy, including payments and clearance (and therefore the stability of the financial system), is at stake.

Banking and company laws, as well as regulators, recognize the importance of shareholders and directors. In the modern market-oriented approach to bank regulation, the emphasis on the fiduciary responsibility of shareholders has increased significantly. This is reflected in several trends, including more stringent bank licensing requirements and the standards that a bank's founder and larger shareholders must meet to be considered "fit and proper" (as further discussed in section 2.7). Broader actions may also be taken against shareholders who fail to properly discharge their responsibilities to ensure the appointment of "fit and proper" persons for the corporate governance process.

Bank licensing procedures normally require the identification of major shareholders and mandate a minimum number of shareholders (which varies among jurisdictions).

Explicit approval of the supervisory authority is required for a person to become a bank's founder or "larger" shareholder, which normally implies owning a certain percentage of the bank's shares (typically 5–10 percent). Such approval is based on the shareholder's ability to meet a certain set of predefined criteria. These criteria are designed to reassure the public that shareholders are able and willing to effectively exercise their fiduciary responsibilities, can provide additional capital to the bank in times of need, and do not see the bank as a provider of funds for their business or related businesses. The central bank normally approves all changes in a bank's shareholding structure. The central banks in most jurisdictions also review and approve a bank's charter and the key bylaws that determine the specific relationship of a bank with its shareholders.

Shareholders should play a key role in overseeing a bank's affairs. They are normally expected to select a competent board of directors whose members are experienced and qualified to set sound policies and objectives. The board of directors must also be able to adopt a suitable business strategy for the bank, supervise the bank's affairs and its financial position, maintain reasonable capitalization, and prevent self-serving practices among themselves and throughout the bank as a whole.

In reality, shareholders may not be able to exercise the oversight function in large banks with dispersed ownership structures. Although the founders of a bank must meet certain standards, as a bank becomes larger and shares more widely held, shareholding may become so diffused that individual shareholders have no effective voice in the bank's management and have little recourse but to sell their shares if they don't like the way the bank is being managed. In such cases, effective supervisory oversight and an effective board of directors become critical.

Assessing the Role of Shareholders

Determining a bank's ownership, control structure, and the status of its capital are key elements of bank assessment. This process should include a review of the ownership register, which should identify by name all shareholders holding more than 2 percent of a bank's capital. The likelihood of a bank engaging in imprudent practices is higher if it is owned by the state than if it is owned by the private sector. An ownership review should therefore also include an

Table 2.3 Bank Shareholder Information, by Category

Shareholder category	Number of shareholders	Shares held		Percentage of shares
		Number	Unit size	
Private companies				
Private individuals				
Public sector and government companies				
Shareholders who own shares in the bank as well as in a company that owns a significant number of shares in the bank				
Shareholders who (directly or through intermediaries) control more than 2 percent of the bank's shares				

assessment of the percentage of *direct* or *indirect* shareholding by the state, by the corporate sector, and by management and employees. It should also state any special rights or exemptions attached to shares. The majority shareholders and therefore the effective owners of the bank can be determined by using a tailored version of table 2.3.

Voting Rights and Special Interests

Other important information concerns the main focus of the larger shareholder businesses and of the people who control them. The bank's corporate charter, any other documents of incorporation, and corporate bylaws should be reviewed to determine the exact nature of the relationship between shareholders and the bank.

Special attention should be paid to any situations where more than 75 percent of the votes of shareholders and directors is required to pass a motion (special resolution), because this could create unwarranted special protection (as opposed to legitimate protection of minority interests). A key question to ask is whether resolutions require more than a simple majority of votes to be accepted, and if so, under what circumstances. In addition, the existence of provisions that either limit voting rights or allow voting rights to individual shareholders or classes of shareholders that are disproportionate to their shareholding should be considered, as well as whether other options exist to acquire more capital.

Another issue is whether shareholders are carrying out their fiduciary responsibilities effectively and whether they have taken advantage of their ownership positions in the bank. This happens when shareholders do not exercise their voting rights.

In practical terms, this can be ascertained by reviewing selected aspects, including the frequency of shareholder meetings, the number of shareholders who are normally present, and the percentage of total shares they represent. The level of direct involvement, if any, that the shareholders have with the bank, the supervisory board (directors), and the management board (executives) should also be considered. Such an assessment should include a review of the current composition of the management and supervisory boards; their remaining terms of office; and connections between board members, shareholders, and bank customers. A review should be conducted of the bank's level of exposure to shareholders having more than 1 percent of holdings who are bank customers, including an examination of amounts, terms, conditions, and funding extended to shareholders through instruments such as loans and deposits.

2.6 The Board of Directors: Bearing Ultimate Responsibility for a Bank's Affairs

The board of directors is responsible for reviewing and guiding corporate strategy, major plans of action, risk policy, and annual budgets and business plans; monitoring corporate performance; and overseeing major capital expenditures, acquisitions and disposals, information technology (IT), and stakeholder relations—all while still retaining full and effective control over the bank.

In other words, ultimate responsibility for the way in which a bank's business is conducted lies with the board of directors. The board sets the strategic direction, appoints management, establishes operational policies, and, most importantly, takes responsibility for ensuring the soundness of a bank. The board is answerable to depositors and shareholders for the lawful, informed, efficient, and able administration of the institution. The members of the board usually delegate the day-to-day management of banking to officers and employees, but board members are responsible for the consequences of unsound or imprudent policies and practices concerning lending, investing, protecting against internal fraud, and any other banking activity.

A board of directors attracts significant interest from regulators because a risk-based approach to bank supervision emphasizes the board's fiduciary

responsibilities and seeks to ensure that its directors are qualified and able to effectively carry out such responsibilities. Laws and regulations typically govern the election, required number, qualifications, liability, and removal of board members and officers, as well as disclosure requirements for directors' outside business interests. Other laws and regulations address restrictions, prohibitions, purchases from and sales to board members, commissions and gifts for procuring loans, embezzlement, abstraction, willful misapplication, false entries, penalty for political contributions, and other matters.

Importance of independent board members. Board members are normally categorized into three groups:

- *Nonexecutive board members who are independent* should have no material interest in the bank. Such board members do not represent any specific major shareholder and are therefore assumed to exercise independent judgment. Independent directors should make up the majority of the board. In many jurisdictions, the audit and risk committees of publicly traded banks must be entirely constituted of independent nonexecutives, although banking legislation tends to be somewhat more flexible in requiring independent chairpersons and a nonexecutive majority on such committees.
- *Nonexecutive board members who are deemed nonindependent* are often executives of a major shareholder and are elected to the board to ensure that such shareholders' interests are safeguarded. This does not mean that nonindependent directors do not exercise sound judgment. That they have a broader market or group view is often what makes them invaluable as board colleagues.
- *Executive board members* usually hold senior positions in the bank, often as chief executive officer or chief financial officer. It is important to have more than one executive on a board to ensure that the board receives an accurate and unbiased assessment from executives.

Tenure of board members. Stock exchanges are increasingly requiring that board members retire after nine years to ensure that they remain independent, although nine years should not be deemed a magical number. Board members can serve for much longer and remain independent thinkers. Issues raised in practice relate more to the difficulty of seeing board materials as fresh after a certain number of years—seasoned board members might therefore fall into a trap of thinking that there is nothing new, exactly when care and diligence is required as a result of subtle market changes.

Independence of chairpersons. Independent chairpersons are crucial. A board with a strong nonexecutive chairperson is more likely to be able to provide objective inputs than a board whose chairperson is also the chief executive. Where the chairperson is a major shareholder, a former senior executive of the bank, or someone who acts in concert with a major shareholder, it can be difficult for the entire board to act independently, because decision making could become informal and take place outside of formal board meetings.

Composition of the board (structure and knowledge). The composition of a board of directors is crucial. In failed banks, board members either lack banking knowledge or were uninformed and passive regarding governance of the bank's affairs. A strong managing director and a weak board are a recipe for disaster. Further, where a board is too large, it becomes a talking shop, with each director being afforded the courtesy of a speaking turn rather than engaging in constructive debate.

A banking institution needs a board that is both strong and knowledgeable. It is essential that the board encourages open discussion and, even more important, tolerates conflict well because conflict indicates that both sides of the coin are being considered. Therefore, shareholders considering the appointment of a board member should review qualifications, career and experience, sector expertise, relations with shareholders, and integrity. A board must be strong, independent, and actively involved in its bank's affairs. Both the bank directors and the executive management must adhere to high ethical standards and be "fit and proper" to serve. Although the bank's directors will not necessarily be experts on banking, they should have the skills, knowledge, and experience that enable them to perform their duties effectively.

The required number of board members varies among jurisdictions, but the standard requirement is that most of the board members should not be executives of the bank. In banking systems that use the supervisory board model, it is typical that all directors are nonexecutives. Despite the strengths of this approach, the lack of involvement in policy setting by wholly nonexecutive boards is a major disadvantage. Boards with only one executive member typically view the bank in the way that the managing director does. If a board of directors instead includes more than one executive member, board members will have a broader perspective and will be able to look at the company through the eyes of more than one senior executive.

Duties of the board. One of the most important duties of the board is to ensure that the management team has the necessary skills, knowledge, experience, and sense of judgment to manage the bank's affairs in a sound and responsible manner. The management team should be directly accountable to the board, and this relationship should be supported by robust structures. During good times, a board sets tone and direction. It oversees and supports management efforts, tests and probes recommendations before approving them, and makes sure that adequate controls and systems are in place to identify and address concerns before they become major problems. During bad times, an active, involved board can help a bank survive if it can evaluate problems, take corrective actions, and, when necessary, keep the institution on track until effective management can be reestablished and the bank's problems resolved.

An effective board should have a sound understanding of the nature of the bank's business activities and associated risks. It should take reasonable steps to ensure that management has established strong systems to monitor and control those risks. (The board's risk management responsibilities are summarized in box 2.2.) Even if members of the board are not experts in banking risks and risk management systems, they should ensure that such expertise is available and that the risk management system undergoes appropriate reviews by qualified professionals. The board should in a timely manner take the necessary actions to ensure a capitalization of the bank that reasonably matches its economic and business environment and business and risk profile.

The board should ensure that the bank has adequate audit arrangements and risk management committees in place and that risk management systems are properly applied at all times. Directors need not be experts in these risk management and audit mechanisms, but they should consult experts within and, if necessary, outside the bank to ascertain that such arrangements are robust and are being properly implemented.

The board should also ensure compliance with banking laws and regulations applicable to a bank's business. It should take all reasonable steps to ensure that the information in the bank's disclosure statements is transparent and accurate and that adequate procedures are in place, including external audits or other reviews where appropriate, to ensure that the disclosed information is not false or misleading.

BOX 2.2 Financial Risk Management Responsibilities of a Bank's Board of Directors

Legal principles in banking laws and regulations leave no room for doubt that the board of directors is the primary player in the risk management process. Following are the board's primary responsibilities:

- Formulate a clear policy and risk appetite for each risk management area, ensuring effective linkage between risk appetite and strategy
- Design or approve structures that include clear delegation of authority and responsibility at each level
- Review and approve policies that clearly quantify acceptable risk, specifying the quantity and quality of capital required for the safe operation of the bank
- Ensure that senior management establishes and maintains an adequate, effective, and efficient internal control system and, accordingly, supports the internal audit function in discharging its duties effectively
- Periodically review controls to ensure that they remain appropriate and periodically assess the long-term capital maintenance program
- Obtain explanations where positions exceed positions limits, reviews of credit granted to directors and other related parties, significant credit exposures, and adequacy of provisions made
- Ensure that the internal audit function includes a review of adherence to policies and procedures
- Formally delegate to management the authority to formulate and implement strategies (however, critically appraising and ultimately approving the strategic plan)
- Specify content and frequency of reports
- Ensure sound staffing and remuneration practices and a positive working environment
- Annually evaluate the performance of the chief executive officer
- Elect a committee, primarily made up of nonexecutive directors, to determine the remuneration of executive directors.

Assessment of the board. A bank appraisal always includes an assessment of the structure and effectiveness of the board. A major objective of the appraisal is to determine whether the board is staffed with competent and experienced directors who are able and willing to effectively carry out their responsibilities, who fully understand their duties, and who have developed adequate objectives and policies. The appraisal should include review of the minutes of board meetings and, for each functional area, a complete set of reports provided regularly to the relevant director. The follow-up actions undertaken by the directors can be assessed to determine whether the board is effectively fulfilling its responsibility to supervise the bank's affairs and stay informed of its condition.

A particularly important part of the appraisal is the review of the bank's compliance with laws and regulations and assessment of whether conflicts of interest or self-serving practices exist. A self-serving board is a dangerous board, and when decisions involve a conflict of interest, the director in question should fully disclose the nature of the conflict and abstain from voting on the matter. Such transactions should be scrutinized carefully for the potential of self-serving behavior.

Other self-serving practices of which supervisors and analysts should be aware include the use of a bank's credit potential by directors, officers, or shareholders to obtain loans or to transact other business. The issuance of unwarranted loans to a bank's directors or to their business interests is a serious matter from the standpoints of both credit and management. Losses that develop from such unwarranted loans are bad enough, but the weakening effect on the bank's general credit culture is likely to be even worse. Attention should also be paid to the possibility of gratuities being given to directors for the purpose of obtaining their approval of financing arrangements or of the use of particular services.

2.7 First Line of Defense: Management and Staff, Responsible for Bank Operations and Implementation of Risk Management Policies

A banking system's financial soundness and performance ultimately depend on the boards of directors and on the senior management of member banks, as confirmed by many regulatory authorities. From the global system perspective, senior management is the *first line of defense* in ensuring a good business perspective and financial condition of a bank and, ultimately, of the banking

system and markets. The strategic positioning of a bank; the nature of a bank's risk profile; and the adequacy of the systems for identifying, monitoring, and managing the profile reflect the quality of both the management team and the directors' oversight of the bank.

For these reasons, the most effective strategy to promote a sound financial system is to strengthen the accountability of directors and management and to enhance the incentives for them to operate banks prudently. The role of senior management is therefore a fundamental component of a risk-based approach to regulation and supervision. Regulators increasingly aim to strengthen the participation and accountability of senior management for the maintenance of a bank's safety and soundness.

The quality and experience of the individuals in a senior management team are important. In a financial institution, the risk management process does not start at the strategy meeting, in the planning process, or in any other committee; it starts when a prospective employee is screened for appointment to the organization or for promotion to a senior position.

Regulators take several different approaches to ensuring that management is "fit and proper"—most establishing standards that a manager must meet (box 2.3). Jurisdictions with such standards often require the central bank to confirm the experience, technical capacity, and professional integrity of senior management before newly appointed managers can assume their duties. However, some jurisdictions do not, as a matter of policy, get involved in the appointment of senior management unless a bank is deemed unsafe because of incompetent management.

Although the board and management need to support each other, each has its own distinct role and responsibilities to fulfill. The chief executive officer and the management team should run the bank's day-to-day activities in compliance with board policies, laws, and regulations, and they should be supported by a sound system of internal controls. Although the board should leave day-to-day operations to management, the board should retain overall control. The dictation of a board's actions by management indicates that the board is not fulfilling its responsibilities, ultimately to the detriment of the institution.

Responsibilities of Management

Management should provide directors with the information they need to meet their responsibilities and should respond quickly and fully to board requests. In addition, management should use its expertise to generate new and innovative

BOX 2.3 "Fit and Proper" Standards for Bank Directors and Management

- No previous convictions for any crime involving fraud, dishonesty, or violence
- No violation of any law that, in the opinion of the regulator, is designed to protect the public against financial loss from the dishonesty or incompetence of, or malpractice by, the person concerned—a standard that applies when the person is involved in the provision of banking, insurance, investment, and financial services or in the management of juristic persons
- No indication that a director was the effective cause of a particular company's inability to pay its debts
- No involvement in any business practice that was deceitful, prejudicial, or that cast doubt on the manager's competence and soundness of judgment
- Whether any previous application by the person concerned to conduct business has been refused, or whether any license to conduct business has been withdrawn or revoked
- While filling the role of a director or an executive officer of an institution, no instance of the institution being censured, warned, disciplined, or the subject of a court order by any regulatory authority, locally or overseas
- No instance of the person concerned being associated with an institution that has been refused a license or has had its license to conduct business revoked
- No dismissal, debarment, or disciplinary proceedings by any professional or occupational organization, as initiated by an employer or professional body
- No nonpayment of any debt judged due and payable, locally or elsewhere
- No declaration of insolvency
- No convictions of any offenses, excluding traffic violations, political offenses, or offenses committed when the person in question was under the age of 18 years
- No litigation involving the person in question related to the formation or management of any corporate body
- No related-party transactions with the institution concerned

ideas and recommendations for consideration by the board. A bank should also have adequate policies in place to increase the accountability of and provide incentives for its managers to maintain a well-informed overview of business activities and corresponding risks.

The duties and responsibilities of a bank's senior management include appointment to middle-level management positions of people with adequate professional skills, experience, and integrity; establishment of adequate performance incentives and personnel management systems; and staff training. Management should also ensure that the bank has an adequate management information system and that the information is transparent, timely, accurate, and complete.

The key managerial responsibility is to ensure that all major bank functions are carried out in accordance with clearly formulated policies and procedures and that the bank has adequate systems in place to effectively monitor and manage risks. Managerial responsibilities for financial risk management are summarized in box 2.4.

Management's role in identifying, appraising, pricing, and managing financial risk is well defined by most regulators, who have stated that any corporation that uses new financial instruments had to ensure that all levels of management acquire knowledge and understanding of inherent risks and adapt internal accounting systems to ensure adequate control. Risk management should be an integral part of the day-to-day activities of each and every line manager in a bank, so that risk management systems are properly applied and procedures are duly followed. Management should also ensure that the bank has adequate internal controls, including appropriate audit arrangements, because risk management failures often result not from unanticipated or extraordinary risks but from an ineffective decision-making process and weak controls.

Recent changes in international banking have made the management process considerably more demanding. Financial innovation transfers price or market risk from one agent to another, but it does not eliminate the risk itself. The pace of innovation, the growth of off-balance-sheet transactions, and the unbundling of different types of risk have made the analysis of financial statements and the management of a bank's financial position more complex. Management increasingly faces important questions about how best to account for, monitor, and manage risk exposure and how to integrate off-balance-sheet activities into other exposures.

BOX 2.4 Management's Responsibilities Regarding Financial Risk

- Implement strategic plans and policies after approval by the board
- Develop and recommend strategic plans and risk management policies for board approval
- Establish an institutional culture promoting high ethical and integrity standards
- Ensure development of manuals containing policies, procedures, and standards for the bank's key functions and risks
- Implement an effective internal control system, including continuous assessment of all material and operational risks that could adversely affect the achievement of the bank's objectives
- Ensure the implementation of effective controls that enforce adherence to established risk limits and ensure immediate reporting of noncompliance to management
- Ensure that the internal auditors systematically review and assess the adequacy of controls and compliance with limits and procedures
- Develop and implement management reporting systems that adequately address and reflect business risks

Risk Assessment of Management

It is also important that the quality of management be appraised. The assessment of senior management personnel should include the following:

- Integrity (fit and proper qualities) to manage a bank
- Adequate technical capacity and experience
- Systems in place to monitor and control the bank's material risks
- Evaluation of whether systems are properly applied
- Use of appropriate actions when necessary
- Proper managerial guidance and adequate decisions on all key aspects of the bank's business
- Compliance with all conditions prescribed by regulatory authorities
- Establishment of policies that mandate the disclosure of conflicts of interest.

2.8 Second Line of Defense: Chief Risk Officer and Risk Committee, Responsible for Risk Management Oversight

The three key elements of effective risk management include an independent board, a firmwide risk management function, and the auditor's independent assessment of risk governance.

The 2007–09 global financial crisis highlighted that many boards had directors with little financial industry experience and limited understanding of the rapidly increasing complexity of the institutions they were leading. Too often, directors dedicated too little time to understanding the firm's business model and were too deferential to senior management. In addition, many boards paid insufficient attention to risk management or to setting up effective structures, such as a dedicated risk committee, to facilitate meaningful analysis of the firm's risk exposures and to constructively challenge management's proposals and decisions.

Where board risk committees did exist, the committees' staffs were often short on both the necessary experience and independence from management. The information provided to the board was often voluminous and not easily understood, which hampered the ability of board members and directors to fulfill their responsibilities. Moreover, many banks lacked a formal process to independently assess the adequacy of their risk governance frameworks. Without the appropriate checks and balances provided by the board, a well-organized risk management function, and independent assessment functions, a culture of excessive risk taking and leverage was allowed to permeate. Further, with the risk management function lacking the authority, stature, and independence to direct the firm's risk taking, the ability to address any weaknesses in risk governance identified by internal control assessment and testing processes was obstructed.

Regulatory authorities reacted by requiring bank boards to appoint a chief risk officer (CRO) and establish *risk committees*, reporting directly to the board. The CRO must be able to act independently and have direct access to the independent board member chairing the risk committee, whose responsibilities normally include the following:

- Support and conduct oversight of the CRO
- Oversee the risk management infrastructure
- Address risk and strategy simultaneously, including consideration of risk appetite

- Monitor risks and oversee risk exposures, which includes evaluating the design of risk processes
- Advise the board on risk strategy
- Review and discuss with management the bank's compliance with laws and regulations, including major legal and regulatory initiatives
- Evaluate significant risk exposures of the company and assess management's actions to mitigate the exposures in a timely manner (including one-off initiatives and ongoing activities such as business continuity planning and disaster recovery planning and testing)
- Coordinate risk committee activities with the audit committee in instances where there is any overlap with audit activities (for example, an internal or external audit issue relating to risk management policy or practice)
- Approve risk and compliance management policies, frameworks, strategies, and processes
- Monitor containment of risk exposures within the risk appetite framework
- Report assessment of the adequacy and effectiveness of the risk appetite, risk management, internal capital adequacy and assessment process (ICAAP), and compliance processes to the board
- Monitor implementation of risk and compliance management strategy, risk appetite limits, and effectiveness of risk and compliance management
- Initiate and monitor corrective action, where appropriate
- Monitor that the group acts appropriately to manage its regulatory and supervisory risks and complies with applicable laws, rules, codes, and standards in a way that supports the group toward being an ethical and good corporate citizen
- Approve regulatory capital models and risk and capital targets, limits, and thresholds
- Monitor capital adequacy (solvency) and ensure that a sound capital management process exists
- Receive reporting that alerts the committee to other possible areas of developing risks.

Risk Appetite and Risk Limits

Developing and conveying the bank's risk appetite is essential to reinforcing a strong risk culture and ensuring its alignment with the bank's strategic,

capital, and financial plans and compensation practices. The risk governance framework should outline actions to be taken when stated risk limits are breached, including disciplinary actions for excessive risk taking, escalation procedures, and board of directors notification. The bank's risk appetite—the level of risk the bank can accept in pursuit of its objectives before action is deemed necessary to reduce risk—should be clearly conveyed and easily understood by all relevant parties: the board of directors, senior management, bank employees, and bank supervisors.

To achieve such a wide range of risk reporting, the CRO would require adequate resources and should be an exceptionally well-qualified person of sufficient stature to act independently and with authority. CROs generally structure their reporting to risk committees to include most of these items:

- Risk appetite monitoring (table 2.4)
- Strategy and business planning
- Accountabilities for governance and risk management framework
- Business, product, and services development
- Infrastructure design and capacity determination
- Resource management
- Business performance risk
- Legal risk
- Tax risk
- Regulatory risk
- Process maturity
- Information governance, including data maturity
- Reputational risk
- Risk arising from the outsourcing of material tasks or functions
- Technological risk.

Table 2.4 Components of Risk Appetite Monitoring and Reporting

Risk appetite category	Appetite limit monitoring (adherence to board limits)	Risk mitigation techniques
Balance sheet structure	• Growth of balance sheet, per category • Contingent liabilities	• Management action plans to ensure adherence to limits set by board • Specific approval of board members when a hard limit has been exceeded
Income statement	• Return on equity: within target range • Return on assets: above minimum target • Cost-to-income ratio	
Capital adequacy	• Capital adequacy percentage • Common equity percentages • Stress testing results: percentage of capital exposed per different scenarios (budget, market stress, and market disruption)	
Credit risk • Products financed • Counterparty credit risk • Country risk	• Percentage of customers in different rating categories • Overdue accounts • Impairments • Provisions made • Loan loss reserves • Related party exposures • Secured versus unsecured credit	
Liquidity risk	• Net stable funding ratio • Liquidity coverage ratio • Amount of high-quality liquid assets held	
Market risk	• Geographical concentration • Value at risk • Expected shortfall	
Currency risk	• Percentage of capital exposed: net open foreign position limit • Off-balance-sheet currency risks	
Interest rate risk	• Banking book: PV01 (present value of a 1 basis point move) • Balance sheet: percentage overall income exposed if interest rates move a given percentage	
Operational risk	• Operational risk losses • Operational risk - near misses	
Securitization risk	• Securitization or resecuritization structure risk	

Stress Testing

When the BCBS introduced the concept of stress testing in 2009, it emphasized that stress testing is expected to be a critical tool used by banks as part of their internal risk management and capital planning (BCBS 2009). Stress tests and scenario analyses aim to assess the (unanticipated) losses that a bank may incur under certain stress scenarios and the impact that may have on its

business plans, risk management strategies, liquidity planning, or capital adequacy. A stress test is also used as a tool to analyze how a bank would cope with an economic crisis.

The test involves the simulation of various unfavorable financial conditions to determine whether a bank has enough capital to handle whatever scenario comes its way. The results are then studied from quantitative and qualitative perspectives to predict whether the bank will pass or fail. To be effective, stress tests must be flexible, well defined, comprehensive, actionable, accurate, and reconcilable to a data source. The results serve as a basis for assessment of risk management priorities.

Stress testing also serves as a key component of the supervisory assessment process to identify vulnerabilities and assess the capital adequacy of banks. Banks have taken this regulatory requirement and used it for business planning, growth policy, dividend policy, and setting of risk appetite as well as limits or threshold setting.

2.9 Third Line of Defense: Audit Committee and Internal Auditors, Responsible for Internal Control Oversight

Although the board of directors is ultimately responsible for risk management, the *audit committee* can be regarded as an extension of the board's risk management function. An audit committee is primarily responsible for ensuring an effective internal control framework and the preparation and presentation of financial statements to conform with International Financial Reporting Standards (IFRS). It oversees the third line of defense and is a valuable tool to help management with the identification and handling of risk areas in complex organizations. The audit committee must be chaired by an independent board member, and the chief audit executive should have a direct reporting line to the audit committee chair.

The value of audit committees is still controversial. Some groups consider audit committees to be a straw that boards cling to in an attempt to address risk management issues. It is logical that a board facing risk management problems will rush to the historical source of information about problems in the company, namely the auditors. The proponents of this view often point out that the auditors are simply checklist experts, while risk management has never been such a simple pursuit and should not be delegated to any committee, department, or team.

Responsibilities of the Audit Committee and Internal Auditors

Monitoring and directing the internal audit function is an integral part of the audit committee's overall responsibilities. Both the board and management must have a tool to help ensure that policies are being followed and risks are being managed. Under a market-oriented approach, an audit extends beyond matters directly related to administrative controls and accounting. It comprises all methods and measures adopted within the business to safeguard the business's assets and manage its risks, check the accuracy and reliability of accounting and management information, promote operational efficiency, and encourage adherence to management policies. In short, the internal audit can be described as an independent appraisal function and, because it is established within an organization to examine and evaluate its activities, as a valuable service to the organization.

The most important duties of internal auditors are to provide assurance regarding corporate governance, control systems, and risk management processes. Internal auditors should also review annual financial statements before their submission to the board of directors, ensuring that appropriate accounting policies and practices are used in the development of financial statements. The review of financial statements must be detailed enough to allow internal auditors to be able to report on a range of aspects, including the fairness of balance sheet and income statement presentation. The internal auditors also consider compliance with regulatory and legislative requirements, identify all significant discrepancies and disclosure problems, highlight differences between the annual report and management accounts, and point to major fluctuations.

Internal auditors and audit committees therefore make an important contribution to the risk management process. In general terms, risk management responsibilities include monitoring the institution's financial risk profile and reviewing management procedures. The requirements of an effective and competent internal audit function—and by extension, the audit committee—are as follows, according to the June 2012 Basel Principles, *The Internal Audit Function in Banks* (BCBS 2012b):

- Assess the effectiveness and efficiency of the internal control, risk management, and governance systems and processes created by the business units and support functions, and provide assurance on these systems and processes
- Provide an independent assurance to the board of directors and senior management on the quality and effectiveness of a bank's internal control, risk management, and governance systems and processes

- Be independent of the audited activities, which requires the internal audit function to have sufficient standing and authority within the bank
- Act with integrity
- Articulate its purpose, standing, and authority in an internal audit charter
- Ensure that every activity of a banking group (including outsourced activities and those of interest to the regulators) and every entity of the bank falls within the overall scope of the internal audit function
- Communicate regularly with bank supervisors to discuss the risk areas identified by both parties, understand the risk mitigation measures taken by the bank, understand the weaknesses identified, and monitor the bank's responses to these weaknesses.

Some jurisdictions have added certain of the following responsibilities:

- Review the quality, independence, and cost-effectiveness of the statutory audit and nonaudit fees
- Review the appointment of the external auditors for recommendation to the board
- Oversee internal and external audits, including review and approval of internal and external audits
- Review significant audit findings and monitor progress reports on corrective actions
- Rectify reported internal control shortcomings
- Ensure the assessment adequacy and effectiveness of processes, practices, and systems reporting to the board
- Ensure that a combined model is applied, providing a coordinated approach to assurance activities
- Oversee financial risks and internal financial controls, including the integrity, accuracy, and completeness of the annual integrated report (both financial and nonfinancial reporting)
- Receive reports on fraud and IT risks as these relate to financial reporting
- Provide independent oversight of the integrity of the annual financial statements and other external reports issued by the bank.

Internal auditors are also expected to evaluate the external audit function and to ensure follow-up by management of problems identified in auditors' reports. One should, however, appreciate the difficulty of meeting the expectations of the public and regulatory entities. In reality, the ability of internal auditors and committees to satisfy all these requirements is limited. This issue

Table 2.5 Root Cause Analysis of Internal Control Events

***What* happened?**	***Why* did event occur?** **Use event as a trigger and vehicle for broader discussion: that is, what does the occurrence really mean?** **What are the risk drivers (used when designing KPI or KRIs)?**					***Impact* on business and environment or the *whole* bank**	***Action* needed and already taken (consider process reengineering), including accountability and target date**
Identify • Control failure • Economic event • Key process affected by control failure, and so on	*People** • Insufficient numbers • Quality not good (line function, oversight, or governance) • Appropriate deployment in critical areas • Fraudulent behavior • Other (underlying causes of why people do not succeed)	*Process flows and design* • Is process designed to handle all situations (appropriate quality, efficiency, and so on) • Critical availability when required (else leading to inability to process, failure of process)	*Secondary and other processes* Which processes will probably fail if the primary process failed?	*System and technology* • Inadequate capacity • Incorrect output • Critical application not available • Failure of system	*External dependencies* • Counterparts • Regulators: noncompliance, suppliers • Geographic environment • Competitor action • Fraud	*Identify impact on* • Other processes affected • Money • Reputation • Legal and regulatory • Information governance (data quality, record management, client data privacy)	

Note: KPI = key performance indicator; KRIs = key risk indicators.

* A "people" problem is actually often inappropriate processes, overburdening of systems, or an external environmental constraint.

has also received attention by organizations such as the Committee of Sponsoring Organizations of the Treadway Commission (COSO), which is trying to design an effective framework and better methodologies to make the internal audit process more effective (as further discussed in annex 2A).

Root Cause Analysis and Internal Audit

At a minimum, internal auditors should analyze their findings to explain not only *what* caused the control incident or event but also *why* it occurred: Was it a people, process, or technology failure—or was it caused by an external event? This root cause analysis should include several areas (table 2.5) to ensure actionable findings (for example, knowing why "people failed").

2.10 External Auditors: A Reassessment of the Traditional Approach of Auditing Banks

The primary objectives of an audit are to enable the auditor to express an opinion on whether the bank's financial statements fairly reflect its financial condition and to state the results of its operations for a given period. The external audit report is normally addressed to shareholders, but it is used by many other parties, such as supervisors, financial professionals, depositors, and creditors.

The traditional approach to an external audit, under the requirements of the International Standards of Auditing (ISA), typically includes a review of internal control systems. This assessment determines the nature and extent of substantive testing, provides an analytic review or trend analysis, and undertakes a certain amount of detailed testing. Apart from the audit of the income statement, certain line items on the balance sheet are audited through the use of separate programs (for example, fixed assets, cash, investments, or debtors). External auditors have traditionally looked for fraud and mismanagement in the lending function. Audits rarely include a detailed credit analysis of borrowers because bank supervisors have traditionally performed this function.

A risk-based approach to financial regulation also requires a reassessment of the conventional approach to external audits. External auditors, as an integral part of the risk management partnership, have a specific role to fulfill. If market discipline is to be used to promote banking system stability, markets must first be provided with information and the capacity to hold directors and management accountable for the sound operation of a bank. External auditors

play a key role in improving the market's ability to determine which banks to do business with.

External auditors are expected to

- Evaluate risks inherent in the banks they are auditing
- Analyze and evaluate information presented to them to ensure that such information makes sense
- Understand the essence of transactions
- Review management's adherence to board policies and procedures
- Review the information supplied to the board, shareholders, and regulators
- Review adherence to statutory requirements
- Report to the board, shareholders, and regulators on the fair presentation of information submitted to them.

It is clear that the philosophy of and approach to external auditing are crucial to the success or failure of a coordinated strategy of risk management. The work of the external auditor is, of course, an added protection for the financial institution as well as the investor community. It is therefore important that the profession shift from a mere balance sheet audit to an evaluation of the risks inherent in the financial services industry. When such an approach has been fully adopted by all auditors of financial institutions, the risk management process will be significantly enhanced, and all users of financial services will benefit.

The role of the accounting and auditing profession has also gained importance as part of the bank supervision process. Management letters and long-form reports submitted by auditors can provide supervisors with valuable insights into various aspects of a bank's operations. This is especially important in situations when auditors become aware of facts that may endanger the stability of a particular bank or of the banking system. In many countries, especially those where supervisory resources are scarce, supervisors may try to avoid repeating the work that external auditors have already performed for client banks. In such situations, auditors have a broader mandate prescribed by law, but at a minimum it is important to establish adequate liaison mechanisms.

2.11 Combined Assurance

Combined assurance refers to the integration and alignment of the risk management and assurance processes within an organization to optimize risk

governance over the entire risk landscape. It is a mechanism to help assurance providers work together more closely and thereby ensure the right amount of assurance, in the right areas, from people with the best and most relevant skills, as cost-effectively as possible.

Combined assurance is simply about internal communication in a bank. Too often, operational risk staff, ethics committees, and risk committees would report events that have the same underlying causes as items reported by internal or external auditors. When the respective units are acting in silos, these events are usually addressed without linking the systemic issues that are causing the events to occur—in other words, they are addressed by taking care of the symptoms without fixing the underlying cause.

2.12 The Role of the Public: Depositors, Rating Agencies, the Media, and Analysts

Perhaps the greatest disservice that public authorities covering the financial sector have done to investors—particularly in jurisdictions where explicit deposit insurance does not exist—is to create the illusion that regulators can guarantee the safety of the public's deposits. When all is said and done, investors must understand that no management or regulatory protection takes away their own responsibility for their investment decisions. Investors and depositors retain responsibility for applying sound principles in the diversification of risk and in the assessment of a financial institution. In those situations where consumers cannot protect themselves, a limited deposit insurance scheme for banks and simplified contractual disclosure for insurance companies and other portfolio managers may be considered.

The only way in which the public can be protected is if it understands who is taking the risk: the individuals as investors acting through agents (investment managers and brokers) or the financial intermediaries pooling their funds and acting as principals (banks). When this distinction is clearly established and the public more clearly understands the risks that investment entails, the principal role of financial intermediaries will be to ensure that consumers are protected. This will be particularly true if the "fit and proper" requirement described earlier is applied to all providers of financial services.

Investors can be assisted in their risk assessment if the concept of "public" is broadened to include the financial media and analysts, such as stockbrokers, other advisers, and rating agencies. In addition, the market's ability to provide a basis for informed decisions must be improved through full disclosure of the

financial statements of banks as well as by informed and competent analysis in the media. Investors' interests can be safeguarded in more than one way, but disclosure of what is actually happening is essential.

As a general principle, much of the justification for banking regulation rests on alleged imperfections in information disclosure. A policy of adequate information provision would help to mitigate this underlying problem and possibly allow for the removal of many of the quantitative constraints that are prevalent in banking today. Emphasis on transparency and accountability of management would also reduce the compliance cost and regulatory distortions that are often associated with conventional approaches to banking regulation.

Probably the most promising solution to these problems is legally mandated public disclosure. Louis Brandeis, an associate justice of the U.S. Supreme Court, observed, "Publicity is justly commended as a remedy for social and industrial diseases. Sunlight is said to be the best of disinfectants; electric light the most efficient policeman" (Brandeis 1914). This quaint-sounding aphorism still holds true. Brandeis made another crucial point: to be effective, disclosure must be made to the public. One of the most important benefits of mandating public disclosure is that the very awareness that information must be publicly disclosed affects the conduct of financial institutions. Boards of directors and management know that even the most highly technical information, after having been assimilated by the financial press and competitors, will filter through to the public. In the United States and other countries with strict information disclosure requirements, the threat of private litigation engendered by public disclosure increases the incentive to management and boards to avoid problems.

Another form of public disclosure occurs when entities such as Standard & Poor's, Moody's Investors Service, and AM Best publish their ratings of companies. Ideally, these private ratings agencies balance the needs for public disclosure and confidentiality. (Because the agencies receive a great deal of information from the companies themselves—information subsequently made public only in the form of their ratings—the agencies must respect the institutions' desire to keep some things confidential.) Through published ratings, the agencies have the ability to act more quickly and have a more subtle effect than regulators commonly do. If ratings agencies can build a reputation for reliability among financial analysts, senior management in banking institutions, and the broader public, they can also provide an additional form of risk management for banks. Sadly, they do not appear to have fulfilled this mandate and have failed to identify financial sector problems until it was too late.

Market discipline could therefore be encouraged as an effective means of reducing the burden on regulators regarding large, sophisticated investors. The role of financial analysts in assisting the public with risk management should not be underestimated. Financial analysts provide investment advice to clients and are therefore accustomed to presenting financial data from the perspective of investment risk. Investors who buy bank-negotiable certificates of deposit and other wholesale money market instruments should bear risk along with the creditors of bank holding companies. Faced with the possibility of losing their investments, such investors will police banks to protect their interests. Although all regulation can be left to the market, a policy of sharing resources between authorities and the private sector is bound to be more effective than one of the parties acting alone.

Nonetheless, ratings of institutions are sometimes downgraded only when problems have already extensively developed and when substantial, sometimes fatal, damage has been done. The question remains whether the market at large could have recognized deterioration or excessive risk taking early enough if more information had been available. It will likely take a long time to develop techniques for the evaluation of risk and to standardize them in a way to be adequately captured in published data. Market stakeholders are therefore limited in their ability to see credit problems as they develop. The experience of the 1980s, when each major credit problem caused surprise in the market, is likely to remain the general pattern for the foreseeable future.

If market analysts cannot identify and properly evaluate credit and other problems until substantial harm has already been done, market discipline will be insufficient to protect the overall safety of the banking system or of deposit-insurance funds. In fact, the belated imposition of market pressure may complicate the supervisors' task in dealing with problems. Consequently, the need for mechanisms to protect small, less sophisticated investors will continue to exist.

2.13 Conclusion

This chapter has demonstrated that corporate governance cannot be performed by a single party. It requires a partnership of systemic key players such as regulators, institutional key players such as independent board members with a strong ethical foundation, and an involved general public.

Annex 2A: Corporate Governance: International Initiatives

For the past 20 years, many international organizations and country authorities have also declared governance as a priority and have taken the initiative to define key benchmarks for good governance and related topics. Annex 2A summarizes some of the initiatives that have set the stage or affected the regulatory framework and governance practices, both in banks and nonbank financial institutions worldwide, including the following:

- *OECD Principles of Corporate Governance*
- *The Equator Principles*, based on the framework provided by the World Bank Group's International Finance Corporation (IFC)
- *COSO principles* for internal control and financial reporting
- *Country-level initiatives*, including the Sarbanes-Oxley Act (SOX) in the United States, the Cadbury Code in the United Kingdom, and the King Reports in South Africa.

OECD Principles

Aware of the contribution that good corporate governance makes to economic growth, investment, and financial market stability, OECD-member countries made governance a priority topic in 1998. The first set of OECD principles, developed in 1999, has since become an international benchmark for policy makers, investors, corporations, and other stakeholders worldwide. The OECD principles define corporate governance as involving "a set of relationships between a company's management, its board, its shareholders, and other stakeholders. Corporate governance also provides the structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance are determined. Good corporate governance should provide proper incentives for the board and management to pursue objectives that are in the interests of the company and its shareholders and should facilitate effective monitoring, thereby encouraging firms to use resources more efficiently" (OECD 1999).

A new set of OECD principles was announced in 2004 and again revised in 2015 (OECD 2004, 2015). The principles have also been an important input for the bank governance principles developed by the BCBS of the Bank for International Settlement.

Table 2A.1 OECD Principles of Corporate Governance, 2015

Principle	Description
Principle I Ensuring the basis for an effective corporate governance framework	The corporate governance framework should promote transparent and efficient markets; be consistent with the rule of law; and clearly articulate the division of responsibilities among different supervisory, regulatory, and enforcement authorities.
Principle II Right and equitable treatment of shareholders and key ownership functions	The corporate governance framework should protect and facilitate the exercise of shareholders' rights.
Principle III Institutional investors, stock markets, and other intermediaries	Institutional investors acting in a fiduciary capacity should disclose their corporate governance and voting policies with respect to their investments, including the procedures that they have in place for deciding on the use of their voting rights.
Principle IV Role of stakeholders in corporate governance	The corporate governance framework should recognize the rights of stakeholders established by law or through mutual agreements and encourage active cooperation between corporations and stakeholders in creating wealth, jobs, and the sustainability of financially sound enterprises.
Principle V Disclosure and transparency	The corporate governance framework should ensure that timely and accurate disclosure is made on all material matters regarding the corporation, including the financial situation, performance, ownership, and governance of the company.
Principle VI Responsibilities of the board	The corporate governance framework should ensure the strategic guidance of the company, the effective monitoring of management by the board, and the board's accountability to the company and the shareholders

Source: OECD 2015.

Note: OECD = Organisation for Economic Co-operation and Development.

The Equator Principles and Social Responsibility

As of April 2018, 92 financial institutions in 37 countries had officially adopted the Equator Principles—a risk management framework for determining, assessing, and managing environmental and social risks in project finance. It is primarily intended to provide key standards for the design, due diligence, and monitoring and support for responsible risk decision making in international project finance (Equator Principles 2019). The Equator Principles, formally launched June 4, 2003, in Washington, DC, were based on existing

environmental and social policy frameworks established by the IFC. The signatories (referred to as Equator Principles Financial Institutions [EPFIs]) commit to implementing the Equator Principles in their internal environmental and social policies, procedures, and standards for financing projects and will not provide project-related finance or corporate loans where the client will not, or cannot, comply with the Equator Principles.

The Equator Principles have greatly increased the attention and focus on social and community standards and responsibility, including robust standards for indigenous peoples, labor standards, and consultation with locally affected communities within the project finance market. They have also promoted convergence around common environmental and social standards. Multilateral development banks (including the European Bank for Reconstruction and Development) and export credit agencies through the OECD Common Approaches are increasingly drawing on the same standards as the Equator Principles.

The Equator Principles have also helped spur the development of other environmental and social management practices in the financial sector and banking industry and have provided a platform for engagement with a broad range of interested stakeholders, including nongovernmental organizations (NGOs), clients, and industry bodies.

COSO Frameworks

The Committee of Sponsoring Organizations of the Treadway Commission (COSO) was convened by the U.S. Congress in response to well-publicized financial irregularities in the late 1980s. COSO formulated an internal control framework and an enterprise risk management (ERM) framework designed to help organizations reduce the risk of asset loss, ensure the reliability of financial statements and compliance with laws and regulations, and promote efficiency. Both frameworks focus on the improvement of organizational thought leadership. Many public sector and professional bodies recognize the COSO frameworks as constituting a standard for the evaluation of internal control and the enterprise risk environment.

Internal Control Integrated Framework

Under the COSO integrated framework for internal control of financial reporting, the effectiveness of an internal control system is measured by its capacity to provide reasonable assurance to management and to the board of directors of their bank's achievement of its objectives in three categories (COSO 2013): (a) effectiveness and efficiency of *operations*, (b) reliability of

financial *reporting*, and (c) *compliance* with applicable laws and regulations. The emphasis on behavior in the COSO model is a recognition of reality: namely, that policies specify what management wants to happen, but what *actually* happens—and which rules are obeyed, bent, or ignored—is determined by corporate culture.

The COSO internal control model consists of five interrelated components that are inherent in the way management runs the organization. The components are linked and serve as criteria for determining whether or not the system is effective. They include control environment, risk assessment, control activities, information and communication, and monitoring activities.

Enterprise Risk Management Framework

When COSO updated its ERM framework in 2017 (box 2A.1), it was aware that certain misconceptions may exist regarding ERM. It clarified that ERM should not be seen as a function or a department by stating the following (COSO 2017):

- ERM is the culture, capabilities, and practices that organizations integrate with strategy setting and apply when they carry out that strategy, with a purpose of managing risk in creating, preserving, and realizing value.
- ERM is more than a risk listing. It requires more than taking an inventory of all the risks within the organization. It is broader and includes practices that management puts in place to actively manage risk.
- ERM addresses more than internal control. It also addresses other topics such as strategy setting, governance, communicating with stakeholders, and measuring performance. Its principles apply at all levels of the organization and across all functions.
- ERM is not a checklist. It is a set of principles on which processes can be built or integrated for a particular organization, and it is a system of monitoring, learning, and improving performance.

United States: The Sarbanes-Oxley Act

This legislation was the response to a series of corporate scandals that erupted in the United States in the early 2000s. Section 302 of the Sarbanes-Oxley Act (SOX) requires that management certify the following:[1]

- They have viewed their company's financial report.
- To the best of their knowledge, the report contains no untrue statement of a material fact and does not omit any material fact that would cause any statements to be misleading.

- To the best of their knowledge, the financial statements and other financial information in the report fairly present, in all material aspects, the company's financial position, results of operations, and cash flows.
- They accept responsibility for establishing and maintaining disclosure controls and procedures, and the report contains an evaluation of the effectiveness of these measures.

BOX 2A.1 Principles of the COSO Enterprise Risk Management (ERM) Framework

1. *Governance and culture:* Governance sets the organization's tone, reinforcing the importance of, and establishing oversight responsibilities for, enterprise risk management. Culture pertains to ethical values, desired behaviors, and understanding of risk in the entity.
2. *Strategy and objective setting:* Enterprise risk management, strategy, and objective setting work together in the strategic-planning process. A risk appetite is established and aligned with strategy; business objectives put strategy into practice while serving as a basis for identifying, assessing, and responding to risk.
3. *Performance:* Risks that may impact the achievement of strategy and business objectives need to be identified and assessed. Risks are prioritized by severity in the context of risk appetite. The organization then selects risk responses and takes a portfolio view of the amount of risk it has assumed. The results of this process are reported to key risk stakeholders.
4. *Review and revision:* By reviewing entity performance, an organization can consider how well the enterprise risk management components are functioning over time and in light of substantial changes, and what revisions are needed.
5. *Information, communication, and reporting:* Enterprise risk management requires a continual process of obtaining and sharing necessary information, from both internal and external sources, which flows up, down, and across the organization.

Source: COSO 2017.

- Any major deficiencies or material weaknesses in controls and any control-related fraud have been disclosed to the audit committee and external auditor.
- The report discloses significant changes affecting internal controls that have occurred since the last report and whether corrective actions have been taken.

The most contentious aspect of SOX is section 404, which is also the costliest to comply with. It requires that management and the external auditor report on the adequacy of the company's internal control over financial reporting (ICFR) as part of each annual reporting cycle. The report must affirm "the responsibility of management for establishing and maintaining an adequate internal control structure and procedures for financial reporting." The report must also "contain an assessment, as of the end of the most recent fiscal year, of the effectiveness of internal control structure and financial reporting procedures." More specifically, the chief executive officer and the chief financial officer must personally report on the adequacy and effectiveness of internal controls over financial reporting, including

- The internal control framework used by management;
- Management's assessment of the effectiveness of internal controls;
- Disclosure of any material weaknesses found by the auditor;
- The result of the external audit required to independently evaluate management's assessment (a requirement of the Securities and Exchange Commission); and
- A statement of any material weaknesses to be included in the company's annual report.

To do this, managers are generally adopting an internal control framework such as that described in COSO (2013). The cost of compliance with this and related legislation (such as the Dodd-Frank Wall Street Reform and Consumer Protection Act)[2] has been significant.

United Kingdom: The Cadbury Code

The Cadbury Code (issued in 1992 by the United Kingdom's Committee on the Financial Aspects of Corporate Governance chaired by Adrian Cadbury) emphasizes the principles of openness, integrity, and accountability. Openness is described as the basis for the confidence necessary between business and all those who have a stake in its success. Open disclosure of information contributes to the efficient working of the market economy, prompts boards to take effective action, and allows shareholders and others to scrutinize companies more thoroughly.

South Africa: King Reports

South Africa's series of King Reports documents initiatives to improve corporate governance in a smaller OECD partner country. Unlike its counterparts in other countries at the time, the 1994 King Report on Corporate Governance went beyond the financial and regulatory aspects of corporate governance; it advocated an integrated approach to good governance in the interests of a wide range of stakeholders and the fundamental principles of good financial, social, ethical, and environmental practice. This approach built on the 1990 South African banking legislation that assigned accountabilities to the key corporate governance stakeholders.

In adopting a participative corporate governance system of enterprise with integrity, the 1994 King Report emphasized the need for companies to recognize that they no longer act independently from the societies in which they operate. The King Report moved away from a single focus on the entity's bottom line by embracing economic, environmental, and social aspects of an entity's activities. It also distinguished *accountability* from *responsibility*. The King Report has been updated several times, and the current King IV report has been effective since April 2017 (IoDSA 2017). The latest update renews the focus on ethical and good governance, emphasizing

- Sustainable development;
- Integrated thinking;
- Corporate citizenship;
- Stakeholder inclusivity; and
- Company's role and responsibility in society.

Notes

1. Sarbanes-Oxley Act of 2002, Pub. L. No. 107–204, 116 Stat. 745 (2002).
2. Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, Pub. L. 111–203, 124 Stat. 1376 (2010).

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3

Risk Analysis: Tools and Techniques

KEY MESSAGES

- Good governance and effective controls are the overarching elements of risk management.
- The key aspects of risk management are the identification, assessment and quantification, and monitoring of a bank's risk profile.
- Risk-based financial analysis requires a framework for transparent disclosure.
- Analytical techniques facilitate an understanding of interrelationships between risk areas within the bank and among different banks.
- Trend analysis provides information regarding the volatility and movement of an individual bank's financial indicators over different time periods. Ratios are often interrelated, and when analyzed in combination, they provide another useful aspect for risk analysis.
- The percentage composition of the balance sheet, income statement, and various account groupings enables comparison between time periods and also between different banking institutions at a given point in time.
- Computation of ratios and trends provides an answer only to "what happened."
- Analysis of the results should be performed to identify the "root cause" (why events occurred), the impact of those events, and what action management should take to rectify a situation or continue a desired trend.

3.1 Risk-Based Analysis of Banks

The objective of financial statements prepared according to International Financial Reporting Standards (IFRS) and generally accepted accounting principles (GAAP) is to provide information that is generally useful in making economic and business decisions. However, even financial statements prepared to meet the applicable national or international norms may lack

some information that may be needed to perform all aspects of financial risk analysis, because financial statements largely portray the effects of past events and do not necessarily provide nonfinancial information. Nonetheless, IFRS statements do contain data about an entity's past performance (income and cash flows) as well as its current financial condition (assets and liabilities) that are useful in assessing risks and future prospects. The financial analyst must be capable of using the financial statements in conjunction with other information to reach valid investment conclusions.

Off-site financial statement analysis (analytic review) normally consists of a review of financial conditions and specific aspects related to risk exposure and risk management. On-site review normally covers a much larger number of topics and is also concerned with qualitative aspects, including quality of corporate governance, physical infrastructure, availability of necessary information, and sound management. The practices of bank supervisors and the analytical methods used by financial analysts continue to evolve. This evolution is necessary to meet the challenges of innovation and new developments and to accommodate the convergence of international supervisory standards and practices, which are continually updated by the Basel Committee on Banking Supervision (BCBS).

Traditional banking analysis is based on a range of quantitative supervisory tools for assessing a bank's condition, including ratios. Ratios are normally related to liquidity, the adequacy of capital, quality of the investment portfolio, profitability, leverage, extent of insider and connected lending, size of exposures, and open foreign exchange positions. Although these measurements are generally useful, they are not in themselves an adequate indication of a bank's risk profile, the stability of its financial condition, or its prospects.

Although the central technique for analyzing financial risk remains a detailed review of a bank's balance sheet, risk-based bank analysis includes other important qualitative factors and places financial ratios within a broad framework of risk assessment and management and the changes or trends in various types of financial risks. It also underscores the relevant institutional aspects, such as the quality and style of corporate governance and management; the adequacy, completeness, and consistency of a bank's policies and procedures; the effectiveness and completeness of internal controls; and the timeliness and accuracy of management information systems and information support.

As stated in chapter 1, a bank should be analyzed as both a single entity and on a consolidated basis, where appropriate, considering the exposures of

subsidiaries and other related enterprises at home and abroad. A holistic perspective is necessary when assessing a bank on a consolidated basis, especially if the institution is spread over a number of jurisdictions or foreign markets. A broad view accommodates variations in the features of specific financial risks that are present in different environments.

A risk-based analysis indicates whether an individual institution's behavior is in line with peer group trends and industry norms, particularly when it comes to significant aspects such as profitability, structure of the balance sheet, and capital adequacy. A thorough analysis can indicate the nature of and reasons for any deviations. A material change in an individual institution's risk profile could be the result of unique circumstances that have no impact on the banking sector as a whole, or it could be an early indicator of trends.

The picture reflected by financial ratios also depends largely on the timeliness, completeness, and accuracy of data used to compute them. For this reason, the issue of usefulness and transparency is critical, as is accountability, which has become an important topic because of both the growing importance of risk management for modern financial institutions and the emerging philosophy of supervision.

An analyst should evaluate financial information based on the following:

- *Financial institution's goals.* Actual ratios can be compared with company objectives to determine whether the objectives are being attained.
- *Banking industry norms (cross-sectional analysis).* A company can be compared with others in the industry by relating its financial ratios to industry norms or a subset of the companies in an industry. An analyst must be careful when using industry norms in the assessment process because
  - Not all ratios are important to all entities;
  - Companies may have several lines of business, which distorts aggregate financial ratios and makes it preferable to examine industry-specific ratios by lines of business;
  - Differences in accounting methods can distort financial ratios; and
  - Differences in corporate strategies can affect certain financial ratios.
- *Economic conditions.* Financial ratios tend to improve when the economy is strong and to weaken during recessions. Therefore, financial ratios should be examined in light of the phase of the business cycle in which the economy is traversing.

3.2 Understanding the Purpose of the Analysis

Financial analysis applies analytical tools to financial statements and other financial data to interpret trends and relationships in a consistent and disciplined manner. In essence, the analyst converts data into information and thereby enables the screening and forecasting of information. The entity's financial statements are primary sources of data.

Integrating the various analytical components and techniques discussed in this chapter will distinguish a well-reasoned analysis from a mere compilation of various pieces of information, computations, tables, and graphs. The challenge is for the analyst to develop a storyline, providing context (country, macroeconomy, sector, accounting, auditing, and industry regulation, as well as any material limitations on the entity being analyzed); a description of corporate governance; and an account of financial and operational risk and then relating the different areas of analysis by identifying how issues affect one another.

Before starting, the analyst should attempt to answer at least the following questions:

- What is the purpose of the analysis?
- What level of detail will be needed?
- What factors or relationships (context) will influence the analysis?
- What data are available?
- How will data be processed?
- What methodologies will be used to interpret the data?
- How will conclusions and recommendations be communicated?

An effective storyline—supporting final conclusions and recommendations—is normally enhanced through the use of data spanning 5–10 years as well as graphs, common-size financial statements, and company and cross-sectional industry trends.

The experienced analyst will distinguish between a computation-based approach and an analytic approach. With certain modifications, this process is similar to the approach used by risk-oriented financial supervisors and regulators.

3.3 Root Cause Analysis: Beyond "What Happened"

In many cases, analysis is simply the calculation of a series of ratios and verification of compliance with preset covenants or regulations, without a serious analysis and interpretation of the implications of the calculations—in

other words, establishing "what happened" without asking even more important questions: "Why?" and "What is the impact?" Once the analyst is sure that the overall approach and reasoning are sound, the analytic review should focus on the following issues (as also set forth in chapter 2, table 2.5):

- *What happened,* established through computation or questionnaires
- *Why it happened,* established through analysis
- *The impact* of the event or trend, established through interpretation of analysis
- *Action* to be taken, based upon
  - The response and strategy of management, established through evaluation of the quality of corporate governance;
  - The analyst's recommendations, established through interpretation and the forecasting results of the analysis; and
  - The vulnerabilities that should be highlighted, included in the analyst's recommendations.

3.4 Analytical Tools

Many tools can assist with bank analysis, including questionnaires and Excel models that could easily be adapted to any banking environment. These often consist of a series of spreadsheet-based data-input tables that enable an analyst to collect and manipulate data systematically. This chapter does not discuss detailed steps regarding the use and content of such tools; rather, it provides a conceptual framework to explain their rationale.

Questionnaires and Data-Input Tables

Bank officials with sufficient authority and experience should complete any questionnaires and data tables used by analysts. Questions should be designed to capture management's perspective on and understanding of the bank's risk management process. The background and financial information requested in the questionnaire will provide an overview of the bank and enable assessment of the quality and comprehensiveness of bank policies, management and control processes, and financial and management information.

Questions fall into the following categories:

- Institutional development needs
- Overview of the financial sector and regulation

- Overview of the bank (history and group and organizational structure)
- Accounting systems, management information, and internal controls
- Information technology
- Corporate governance, covering key players and accountabilities
- Financial risk management, including asset-liability management, profitability, credit risk, and the other major types of financial risk.

To facilitate the gathering and provisioning of data, an analytical model should contain a series of data-input tables for collecting financial data. The data can then be used to create either ratios or graphs (as shown in examples below and in section 3.4). Data tables are normally related to the major areas of financial risk management. The balance sheet and income statements serve as anchor schedules, with detail provided by all the other schedules. The output of an analytical model (tables and graphs) can assist executives in the high-level interpretation and analysis of a bank's financial risk management process and its financial condition.

Automated Processing of Data

The framework described above envisages the automatic production of tables, ratios, and graphs based on computerized manipulation of input data. This allows the analyst to focus on interpretation and analysis—as opposed to mere processing of data—to measure a bank's performance and to judge the effectiveness of its risk management process. Combined with the qualitative information obtained from the questionnaire, these statistical tables and graphs make up the raw material needed to carry out an informed analysis, as required in off-site (or macro-level) reports.

The ratios cover the areas of risk management in varying degrees of detail, starting with balance sheet and income statement schedules. The graphs provide a visual representation of some of the analytical results and a quick snapshot of both the bank's current situation (such as financial structure and the composition of investment portfolios) and comparisons over time.

Calculation of Ratios

A ratio is a mathematical expression of one quantity relative to another. There are many relationships between financial accounts and between expected relationships from one point in time to another. Ratios are a useful way of expressing relationships in the following areas of risk:

- *Activity (operational efficiency):* the extent to which an entity uses its assets efficiently, as measured by turnover of current assets and liabilities and long-term assets
- *Liquidity:* the entity's ability to repay its short-term liabilities, measured by evaluating components of current assets and current liabilities
- *Profitability:* the relation between profit margins and sales, average capital, and average common equity
- *Debt and leverage:* the risk and return characteristics as measured by the volatility of sales and services and the extent of the use of borrowed money
- *Solvency:* the financial risk resulting from the impact of the use of ratios of debt to equity and of cash flow to expense coverage
- *Earnings, share price, and growth:* the rate at which an entity can grow as determined by its earnings, share price, and retention of profits
- *Other:* groupings of ratios representing the preferences of individual analysts in addition to ratios required by prudential regulators such as banking supervisors, insurance regulators, and securities market bodies.

Financial Analysis

Financial analysis can help the analyst make forward-looking projections. Financial ratios aid those projections by providing

- *Insights into the microeconomic relationships* within a firm, which help analysts to project earnings and free cash flow (necessary to determine entity value and creditworthiness);
- *Insights into a firm's financial flexibility*—its ability to obtain the cash required to meet financial obligations or to acquire assets, even if unexpected circumstances should develop; and
- *A means of evaluating management's ability.*

Although ratios are extremely useful tools, they must be used with caution. They do not provide complete answers about a business's bottom-line performance. In the short run, many tricks can be used to make ratios look good in relation to industry standards. An assessment of the operations and management of an entity should therefore be performed to provide a check on ratios.

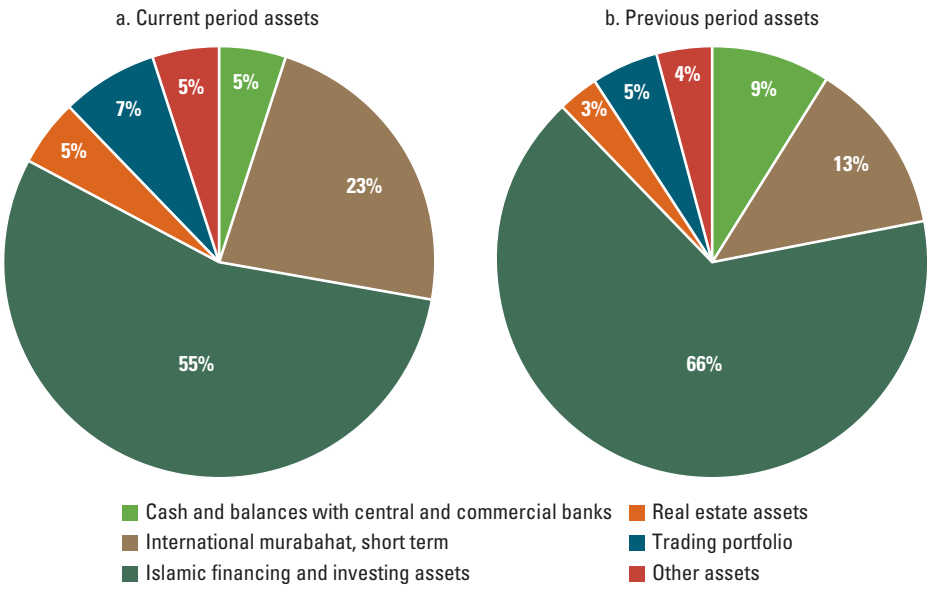
Graphs and Charts

Graphs are powerful tools for analyzing trends and structures. They facilitate comparison of performance and structures over time and show trend lines and changes in significant aspects of bank operations and performance. In addition, they provide senior management with a high-level overview of trends in a bank's risk.

Graphs can illustrate asset and liability structures; sources of income; profitability; capital adequacy; composition of investment portfolios; major types of credit risk exposures; and exposure to interest rate, liquidity, market, and currency risks. Graphs may be useful during off-site surveillance. In this context, they can serve as a starting point to help with on-site examinations and to present the bank's financial condition and risk management aspects succinctly to senior management. They also help external auditors to illustrate points in their presentation to management and other industry professionals to judge a bank's condition and prospects.

Figure 3.1 shows the asset composition of an Islamic bank experiencing significant growth in the proportion of trading securities and a worrying

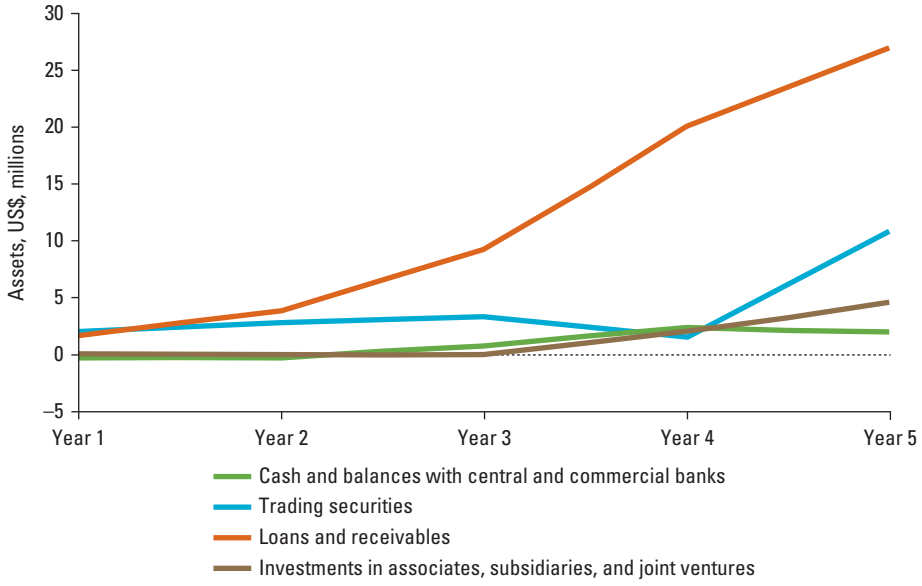
Figure 3.1 Sample Composition of an Islamic Bank's Assets, by Period



Source: Van Greuning and Iqbal 2008.

Note: "Murabahat" refers to an Islamic financing structure in which the seller provides financing that covers the cost and profit-rate margin of an asset (to ensure that interest is not charged).

Figure 3.2 Sample Trends in a Bank's Asset Growth over a Five-Year Period



Source: Van Greuning and Iqbal 2008.

decline in cash. Although not illustrated in the figure, the analyst should compare pie charts for several previous years to determine whether the structural change represented in the current chart is representative of a general trend in the business.

In the same manner, a simple line graph can illustrate the growth trends in key financial variables (figure 3.2). The rapid rise in loans and advances is clearly illustrated alongside the alarming reduction in cash, creating more concern regarding the entity's liquidity: the increase in trading securities and other investments could have caused the reduction in liquidity (depending on how these increases in working capital were financed).

3.5 Analytical Techniques

Data can be interpreted in many ways. Common analytical techniques include ratio analysis, common-size analysis, cross-sectional analysis, trend analysis, and regression analysis.

Ratio Analysis

Ratios are a basic tool for financial analysts and are essential to examine the effectiveness of a bank's risk management process. They are normally the initial points that provide clues for further analysis. Changes in ratios over time offer a dynamic view of bank performance.

Financial ratios mean little when seen in isolation. Their meaning can be interpreted only in the context of other information. It is good practice to compare a bank's financial ratios with those of its major competitors. Typically, the analyst should be wary of banks whose financial ratios are far above or below industry norms. In some cases, evaluating a bank's past performance provides a basis for forward-looking analyses. Such an evaluation may suggest that its performance is likely to continue at similar levels or that an upward or downward trend is likely to occur. However, for a bank making a major acquisition or divestiture, for a new financial institution, or for a bank operating in a volatile environment, past performance may be less relevant to future performance.

Common-Size Analysis: Balance Sheet Structure

An analytical technique of great value is common-size analysis, which is achieved by converting all financial statement items to a percentage of a given financial statement item, such as total assets or total revenue.

The structure of the balance sheet may vary significantly depending on the bank's business orientation, market environment, customer mix, or economic environment. The composition of the balance sheet is normally a result of risk management decisions.

The analyst should be able to assess the risk profile of the business simply by analyzing the relative share of various assets and changes in their proportionate share over time (table 3.1). For example, if any item were to increase rapidly, one would question whether the bank's risk management systems are adequate to handle the increased volume of transactions. In addition, a structural change could disclose a shift to another area of risk. These issues can be raised by an analyst before a detailed review of the management of either credit or market risk. When linked to the amount of net income yielded by each category of assets, this analysis increases in importance, enabling a challenging assessment of risk versus reward.

Analysis of the income statement. Common-size analysis can be used effectively on the income statement as well. The emphasis in the income statement would be on the sources of revenue and their sustainability. A question

Table 3.1 Balance Sheet Structure: Sample Common-Size Analysis for Two Periods

percent

Balance sheet composition	Year 1	Year 2
Assets		
Cash and balances with central and commercial banks	9.3	5.5
Trading securities	13.2	23.3
Loans and receivables	65.8	54.7
Real estate assets	3.0	4.8
Investments in associates, subsidiaries, and joint ventures	4.9	7.1
Other assets	3.8	4.7
TOTAL ASSETS	**100**	**100**
Liabilities and capital		
Customers' deposits	77.7	74.1
Due to banks and other financial institutions	9.5	7.2
Other liabilities	3.8	4.9
Sundry creditors	0.1	0.1
Total equity	8.9	13.7
TOTAL LIABILITIES AND CAPITAL	**100**	**100**

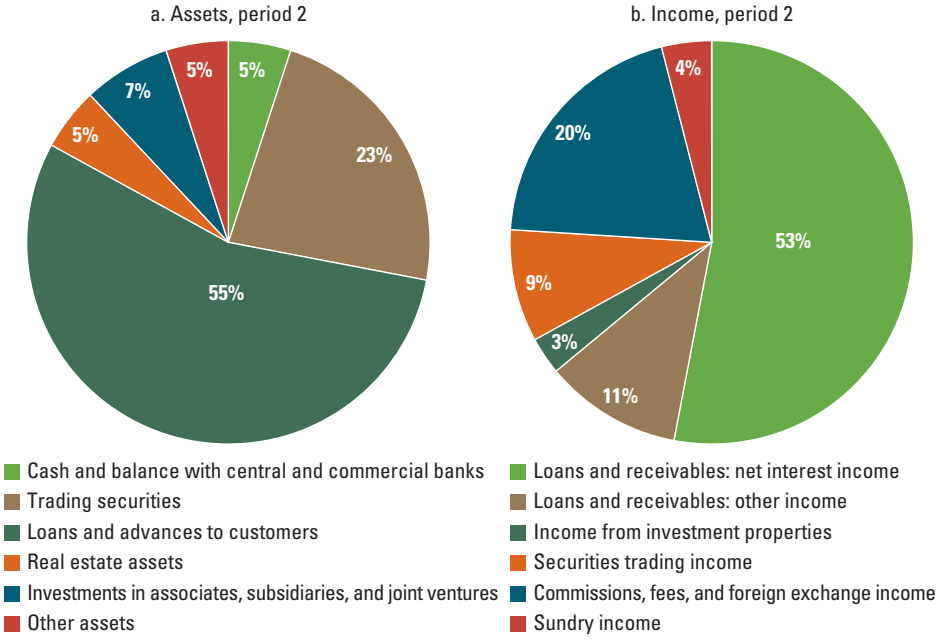
worth asking pertains to the proportion of income earned in relation to the amount of energy invested through the deployment of assets (figure 3.3). When analyzing the income structure of a business, analysts should appropriately consider and acquire an understanding of the following aspects:

- Trends in and the composition and accuracy of reported earnings
- Quality, composition, and level of income and expense components
- Dividend payout and earnings retention
- Major sources of income and the most profitable business areas
- Any income or expenditure recognition policies that distort earnings
- Effect of intergroup transactions, especially those related to the transfer of earnings and asset-liability valuations.

Cross-Sectional Analysis

Ratios are not meaningful on their own, which is why financial analysts prefer trend analysis (the monitoring of a ratio or group of ratios over time)

Figure 3.3 Sample Common-Size Analysis of Income Statement: Assets Deployed versus Income Earned



Source: Van Greuning and Iqbal 2008.

and comparative analysis (the comparison of a specific ratio for a group of companies in a sector or for different sectors, as shown in table 3.2). This comparison becomes a useful tool in establishing benchmarks for performance and structure.

Cross-sectional analysis of common-size financial statements makes it easier to compare an entity to other entities in the same sector, even though the entities might be of different sizes and operate in different currencies. If the examples given in table 3.1 or table 3.2 referred to two different banks, rather than simply to the same bank over more than one year, then the conclusions would compare the relative levels of liquidity and structure of assets between the two banks.

However, the analyst must be realistic when comparing entities, because size does influence business results, and entities are seldom exactly the same. Differences in currency are eliminated in the percentage presentation, but the analyst must keep in mind the macroeconomic environment that influences variables such as competition and inflation across currency and national boundaries.

Table 3.2 Sample Cross-Sectional Analysis of Two Bank Balance Sheet Structures

percent

Balance sheet composition	Bank 1	Bank 2
Assets		
Cash and balances with central and commercial banks	9.3	5.5
Trading securities	13.2	23.3
Loans and receivables	65.8	54.7
Real estate assets	3.0	4.8
Investments in associates, subsidiaries, and joint ventures	4.9	7.1
Other assets	3.8	4.7
TOTAL ASSETS	**100**	**100**
Liabilities and capital		
Customers' deposits	77.7	74.1
Due to banks and other financial institutions	9.5	7.2
Other liabilities	3.8	4.9
Sundry creditors	0.1	0.1
Total equity	8.9	13.7
TOTAL LIABILITIES AND CAPITAL	**100**	**100**

Cross-sectional analysis is not the solution to all problems, because different accounting policies and methods will influence the allocation of transactions to specific line items on the financial statements.

Trend Analysis

The trend of an amount or a ratio, which shows whether it is improving or deteriorating, is as important as its current absolute level. Trend analysis provides important information regarding historical performance and growth and, given a sufficiently long history of accurate seasonal information, can be of great assistance as a planning tool for management.

In table 3.3, the last two columns of the trend analysis incorporate both currency and percentage changes for the past two years. A small percentage change could hide a significant currency change and vice versa, prompting the analyst to investigate the reasons despite one of the changes being relatively small. In addition, past trends are not necessarily an accurate predictor of future behavior, especially if the economic environment changes. These caveats should be borne in mind when using past trends in forecasting.

Table 3.3 Sample Balance Sheet Growth, Year-on-Year Fluctuations

percent

Balance sheet composition	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Assets						
Cash and balances with central and commercial banks	Base year	–16	7	66	74	–12
Trading securities	Base year	49	14	8	–25	165
Loans and receivables	Base year	21	21	43	62	25
Real estate assets	Base year	53	–10	8	–5	137
Investments in associates, subsidiaries, and joint ventures	Base year	n.a.	n.a.	n.a.	n.a.	119
Other assets	Base year	77	40	107	–17	82
TOTAL ASSETS	Base year	28	16	34	40	50
Liabilities and capital						
Customers' deposits	Base year	29	17	25	34	43
Due to banks and other financial institutions	Base year	12	32	334	194	13
Other liabilities	Base year	14	11	49	27	94
Sundry creditors	Base year	22	26	11	166	82
Total equity	Base year	28	8	75	29	130
TOTAL LIABILITIES AND CAPITAL	Base year	28	16	34	40	50

Note: n.a. = not applicable.

Variations of trend analysis. Changes in currency and percentages focus the analysis on material items. A variation of growth in terms of common-size financial statements would be to combine currency and percentage changes. Even when a percentage change seems insignificant, the magnitude of the amount of currency involved might be significant and vice versa. Such combined analysis is therefore a further refinement of the analysis and interpretation of annual changes.

Annual growth (year-to-year). A bank, like any other business that is well positioned and successful in its market, is expected to grow. An analysis of balance sheets can be performed to determine growth rates and the type of structural changes that have occurred in a bank. Such an analysis indicates the general type of banking business undertaken and requires an understanding of the structure of its balance sheet and the nature of its assets and liabilities.

Even when growth overall is not significant, individual components of the balance sheet normally shift in reaction to changes in the competitive market or in the economic or regulatory environment. As the balance sheet structure changes, inherent risks also change. The structure of a balance sheet should

therefore form part of an assessment of the adequacy and effectiveness of policies and procedures for managing risk exposures. In normal situations, the growth of a bank's assets is determined by an increase in the earnings base and access to stable external funding or investment, at a cost that is acceptable to it.

Banks and businesses that grow too quickly tend to take unjustified risks, and their administrative and management information systems often cannot keep up with the rate of expansion. Banks that grow too slowly can likewise take risks that are unusual or poorly understood by them. Even well-managed banks can run into risk management problems arising from excessive growth, especially concerning management of their working capital.

Cumulative growth from a base year. The analysis that can be performed using this technique is not significantly different from looking at year-to-year growth. Reviewing the cumulative effects of change over time, compared with a base year, dramatizes change and the need for remedial action when change outstrips the ability of risk management and administrative systems to keep up with growth or the enterprise's ability to finance its expansion.

Regression Analysis

Regression analysis uses statistical techniques to identify relationships (or correlations) between variables. Examples of such a relationship could be sales and medium-term trade finance over time or hotel occupancies relative to hotel revenues. In addition to analyzing trends over time, regression analysis enables analytic review as well as identification of items or ratios that are not behaving as they should, given the statistical relationships between ratios and variables.

3.6 The Importance of High-Quality Data—and of Risk Data Aggregation

Analyzing data in the process of risk appraisal is meaningless if the data itself are suspect. In January 2013, the BCBS published the *Principles for Effective Risk Data Aggregation and Risk Reporting* (BCBS 2013), aiming to strengthen banks' risk data aggregation capabilities and internal risk reporting practices (as further discussed in chapter 14). The *Principles* covered are the following:

- Overarching governance and infrastructure;
- Risk data aggregation capabilities;
- Risk reporting practices; and
- Supervisory review, tools, and cooperation.

The BCBS principles are intended to enhance the infrastructure for reporting key information, improve the decision-making process throughout a bank by enhancing information management, and speed up information availability and hence decision making.

Risk data aggregation is described as defining, gathering, and processing risk data according to a bank's risk reporting requirements to enable the bank to measure its performance against its risk tolerance or appetite.

Complying with these principles has not been easy. Executing the large-scale data and information technology projects to correct the risk data architecture across large banking groups with many different franchises or divisions required massive coordination, significant funding, and superb project management skills. The technical specialists capable of executing such projects in most cases were already burdened implementing other significant regulatory requirements—in addition to implementing banks' own strategic plans.

References

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4

Balance Sheet Structure

KEY MESSAGES

- Balance sheet structure lies at the heart of the asset-liability management process.
- The structure or composition of a bank's balance sheet assets and liabilities is among the key factors that determine the institution's profile and level of risk.
- Growth in the balance sheet and resulting changes in the relative proportion of assets or liabilities affect the risk management process.
- Changes in the relative structure of assets and liabilities should be a conscious decision of a bank's policy makers: the board of directors.
- Monitoring key components of the balance sheet may alert the analyst to negative trends in relationships between asset growth and capital retention capability.
- It is also important to monitor the growth of low, nonearning, and off-balance-sheet items.

4.1 Introduction: Composition of the Balance Sheet

The goal of financial management is to maximize the value of a bank, as determined by its profitability and risk level. Because risk is inherent in banking and is unavoidable, the task of financial management is to manage risk such that the different types of risk are kept at acceptable levels and profitability is sustained. Doing so requires the continual identification, quantification, and monitoring of risk exposures, which in turn demands sound policies, adequate organization, efficient processes, skilled analysts, and elaborate computerized information systems.

In addition, risk management requires the capacity to anticipate changes and to act so that a bank's business can be structured and restructured to profit from the changes—or at least to minimize losses. Supervisory authorities should not prescribe how business is conducted; they should instead maintain prudent oversight of a bank by evaluating the risk composition of its assets and by insisting that an adequate capital and reserves are available to safeguard solvency.

Until the 1970s, the business of banking primarily consisted of the extension of credit—in other words, a simple intermediation of deposits that had been raised at a relatively low cost—and bank managers faced fairly simple decisions concerning loan volumes, pricing, and investments. The key managerial challenges of the past were controlling asset quality and resulting loan losses as well as managing overhead expenditures. With the background of recession, volatile interest rates, and inflation during the late 1970s and early 1980s, the management of both assets and liabilities has become necessary to maintain satisfactory margin performance. The complexity of balance sheet management continued to increase as a result of deregulation in the 1980s, with growing competition for funds becoming a primary management concern.

The era of deregulation and increased competition continued in the 1990s, including involvement by financial institutions other than banks. This environment underscored the need for competitive pricing and, in practical terms, for an increase in and engagement of liabilities to maximize spreads and control exposure to related risks. Because of the inverse relationship of these two goals, a balancing act between maximizing the spreads and controlling risk exposures has become a focal point in the financial management, regulation, and supervision of banks. The financial crises since the late 1990s, and the spillover between financial markets, brought the reversal of the deregulation trend.

This chapter highlights the importance of the structure and composition of liabilities and assets as well as the related income statement items. In addition, it illustrates how a bank's risk managers and analysts can analyze the structure of balance sheets and income statements as well as individual balance sheet items with specific risk aspects (for example, liquidity in the case of deposit liabilities or market risk in the case of traded securities). In this process, the interaction between various types of risk must be understood to ensure that they are not evaluated in isolation.

Asset-liability management, which includes raising and using funds, lies at the financial heart of a bank. The asset-liability management process comprises strategic planning and implementation as well as control processes that affect the volume, mix, maturity, interest rate sensitivity, quality, and liquidity of a bank's assets and liabilities. The primary goal of asset-liability management is to produce a high-quality, stable, large, and growing flow of net interest income. This goal is accomplished by achieving the optimum combination and level of assets, liabilities, and financial risk. Asset-liability management is further discussed in chapter 12.

Figure 4.1 Composition of Bank Assets and Liabilities

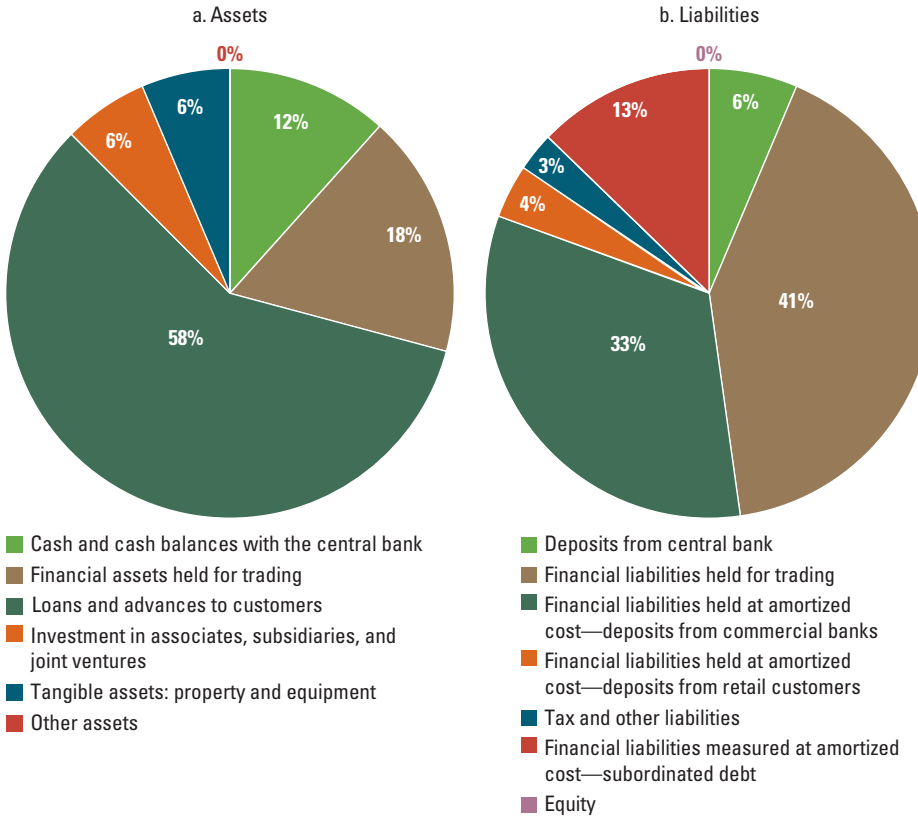


Figure 4.1 illustrates the composition of a bank's assets and liabilities. An evaluation of the balance sheet structure requires understanding not only the bank but also its business and competitive environment; the overall regulatory, economic, and policy environment; and the customer mix. The structure of a typical balance sheet, with deposits from customers on the liability side and loans and advances to customers on the asset side, is also reviewed in this chapter. This pattern reflects the nature of banks as intermediaries, with ratios of capital to liabilities so low that their leverage would be unacceptable to any business outside the financial services industry.

4.2 Bank Assets

The analyst should be able to assess the bank's risk profile simply by analyzing the relative share of various elements in the asset structure and changes in their

proportionate share over time. For example, if the business loan portfolio drops significantly while mortgage lending increases, such a change would reflect a shift from one risk profile to another. Likewise, an increase or decrease in trading securities would indicate a change in the institution's market risk exposure.

The analyst must question whether the bank's risk management systems are adequate to handle the changed risk profile and increased risks. Such an assessment is possible at a macro level before any detailed review of credit, liquidity, or market risk management. When linked to the amount of net income yielded by each category of assets, this analysis increases in importance, necessitating a challenging assessment of risk versus reward.

A bank's balance sheet (statement of financial position) is normally prepared on a liquidity basis rather than on the noncurrent versus current asset basis typical of other enterprises. Of paramount importance to the financial analyst is an assessment of a bank's liquidity as evidenced in its balance sheet and statement of cash flows. Banks need liquid assets sufficient to accommodate expected and unexpected balance sheet fluctuations. In environments where markets are not developed and the liquidity of different claims still depends almost exclusively on their maturity rather than on the ability to sell them, banks tend to keep a relatively high level of liquid assets that bear little or no interest. In such environments, liquid assets typically account for at least 10 percent—or, in extreme situations, as much as 20 percent—of total assets.

Increasing market orientation, the growth of financial markets, and the greater diversity of financial instruments worldwide entail greater short-term flexibility in liquidity management, which in turn reduces the need to hold large amounts of liquid assets. In banking environments with developed financial markets, liquid assets typically account for only about 5 percent of total assets. An appraisal of whether the level of liquid assets is satisfactory must be based on a thorough understanding of money market dynamics in the respective country, because certain assets that appear liquid in good times may not be liquid in more difficult periods. Table 4.1 offers a sample spreadsheet that can be used to assess structural change in the liquidity of a bank's assets.

Cash and Balances with the Central Bank

Cash and balances with the central bank represent the holdings of highly liquid assets, such as bank notes or gold coin, as well as deposits with the central bank. A percentage of deposits is normally required to be held to meet the central bank's reserve requirements and serve as a monetary policy tool. Flat-rate reserve requirements are used to control the amount of money that

Table 4.1 Structure of Assets

percent

Assets	Period 1	Period 2
Cash and cash balances with the central bank		
Financial assets at fair value through profit or loss		
Financial assets at fair value through other comprehensive income (FVOCI)		
Financial assets at amortized cost		
Loans and advances to customers		
Tangible assets (property and equipment)		
Investments in associates, subsidiaries, and joint ventures		
Other assets		
Intangible assets		
Tax assets		
Noncurrent assets and disposal groups classified as held for sale		
TOTAL ASSETS	100	100

a bank can extend as credit. However, when reserve requirements are high, particularly with low or no interest payments, the cost to banks increases. This creates incentives for banks to devise instruments that are not subject to reserve requirements, encourages intermediation through new channels, and may give a competitive advantage to institutions that are not subject to reserve requirements. Such practices tend to reduce the effectiveness and the importance of reserve requirements as a monetary policy tool.

Regulators have tried to make reserve requirements more difficult to circumvent and to reduce the incentives for avoidance. For example, changes in reserve requirements that have been introduced by regulators include a reduction of the level, type, and volatility of reserve holdings. Regulators have also introduced an increase in the various types of compensation made to banks for maintaining reserves.

Financial Assets Held for Trading

These assets represent a bank's investments and proprietary trading books in securities, foreign currencies, equities, and commodities. Although similar securities are involved, the investment portfolio must be distinguished from the proprietary trading portfolio. Proprietary trading is aimed at exploiting market opportunities with leveraged funding (for example, through the use of repurchase agreements), whereas the investment portfolio is held and traded as a buffer or stable liquidity portfolio.

Investment and trading assets are valued in terms of International Financial Reporting Standard (IFRS) 9 and can be classified as "financial assets at fair value through profit or loss (FVTPL)," "fair value through other comprehensive income (FVOCI)," or "amortized cost."[1] (See chapter 5 for the treatment of income on such assets and chapter 16 regarding IFRS disclosure.)

In many low- to middle-income countries, banks have been or are obligated to purchase government bonds or other designated claims, usually to ensure that a minimum amount of high-quality liquidity is available to meet unexpected deposit demands. Frequently, the main purpose of such liquid asset requirements is to ensure a predictable flow of finance to designated recipients. Government is the most frequent beneficiary, often with an implicit subsidy. Such obligatory investments may diminish the availability and increase the cost of credit extended to the economy (and the private sector) and, because of the increased cost of credit, may also increase risk.

In high-income countries and financial markets, an increase in bank investment and trading portfolios generally reflects a bank's growing orientation to nontraditional operations. In such cases, an investment portfolio comprises different types of securities instruments. In risk management terms, such an orientation would mean that a bank has replaced credit risk with market and counterparty risk.

Loans and Advances to Customers

Loans and advances to customers are normally the most significant component of a bank's assets. These include loans for general working capital (overdrafts), investment lending, asset-backed installment and mortgage loans, financing of debtors (accounts receivable and credit card accounts), and tradable debt such as acceptances and commercial paper. Loans and advances are extended in domestic and foreign currency and are provided by banks as financing for public or private sector investments.

In the past decade, innovation has increased the marketability of bank assets through the introduction of sales of assets such as mortgages, automobile loans, and export credits used as backing for marketable securities (a practice known as securitization and prevalent in the United Kingdom and the United States).

An analysis of this trend may highlight investment or spending activity in various sectors of the economy, while an analysis of a foreign currency loan portfolio may indicate expectations regarding exchange rate and interest rate developments. Further, evaluation of trade credits may reveal important trends in the economy's competitiveness and terms of trade.

Tangible Assets (Property and Equipment)

Tangible assets such as property represent the bank's infrastructure resources and typically include the bank's premises, other fixed property, computer equipment, vehicles, furniture, and fixtures. In certain circumstances, banks may have a relatively high proportion of fixed assets such as houses, land, or commercial space. These holdings would be the result of collections on collateral, which, under most regulations, banks are required to dispose of within a set period. They may also reflect a bank's deliberate decision to invest in real estate if the market is fairly liquid and prices are increasing.

In some low- and middle-income countries, investments in fixed assets reach such high proportions that central banks may begin to feel obliged to limit or otherwise regulate property-related assets. A bank should not be in the business of investing in real estate assets, and therefore a preponderance of these assets would affect the assessment of the bank. In wealthier countries, real estate assets not acquired in the normal course of banking business would be booked in a subsidiary at the holding company level to protect depositors from associated risks.

Investments in Associates, Subsidiaries, and Joint Ventures

Other investments could comprise longer-term, equity-type investments such as equities and recapitalization or nontrading bonds held in the bank's long-term investment portfolio. They include investments in subsidiaries, associates, and other listed and unlisted entities.

The percentage of a portfolio that is devoted to this type of instrument varies among countries, although not necessarily as a result of a bank's own asset-liability management decisions. Such assets are also valued in terms of International Accounting Standard (IAS) 39 and will normally be classified as "available-for-sale" or "held-to-maturity" securities.[2]

For equity investments, the balance sheet should be reviewed on a consolidated basis to ensure a proper understanding of the effect of such investments on the structure of the bank's own balance sheet and to properly assess the bank's asset quality.

Other Assets

Other assets typically include prepaid amounts and other sundry items. These vary as to the predictability of income associated with a particular asset,

the existence of markets for such assets, the possibility of selling the assets, and the reliability of the assessments of the asset's useful life. The treatment of assets in evaluating capital adequacy can be controversial. For example, such assets may include suspense accounts, which have to be analyzed and verified to ensure that the asset is indeed real and recoverable.

4.3 Bank Liabilities

As explained in section 4.2, the asset and liabilities structure and the relative share of various types of liabilities is a good indication of the risk profile and the types of risk to which a bank is exposed.

An increase in the level of nonretail deposits funding (such as repurchase agreements or certificates of deposit) could expose the bank to greater volatility in satisfying its funding requirements, requiring increasingly sophisticated liquidity risk management. Funding instruments such as repurchase agreements also expose a bank to market risk in addition to liquidity risk.

The business of banking is traditionally based on the concept of low margins and high leverage. Consequently, a special feature of a bank's balance sheet is its low capital-to-liabilities ratio, which would normally be unacceptable to any other business outside the financial services industry. The acceptable level of risk associated with such a structure is measured and prescribed according to risk-based capital requirements, which are in turn linked to the composition of a bank's assets. As discussed in chapter 6, capital adequacy requirements have been subject to international efforts to establish rules, with guidance by the Basel Committee on Banking Supervision (BCBS). Since 1988, when the first capital adequacy standard, Basel I, was announced, there have been two updates: (a) in 2004, by a more complex Basel II; and (b) ongoing from 2011 to 2019 by the significantly more prescriptive and complex Basel III in response to the 2007–09 global financial crisis.[3]

Although the types of liabilities present in a bank's balance sheet are nearly universal, their exact composition varies greatly, depending on a particular bank's business and market orientation as well as by the prices and supply characteristics of different types of liabilities at any given time. The funding structure of a bank directly affects its cost of operation and therefore determines a bank's profit potential and risk level. The structure of a bank's liabilities also reflects the bank's specific asset-liability and risk management policies. Table 4.2 illustrates a typical liability structure (as later illustrated for multiple periods in figure 4.4).

Table 4.2 Structure of Liabilities

percent

Liabilities	Period 1	Period 2
Central bank funding		
Financial liabilities held for trading		
Short trading positions		
Derivative financial instruments		
Financial liabilities designated at fair value through profit or loss		
Financial liabilities measured at amortized cost		
Deposits from banks and other credit institutions		
Deposits from customers		
Foreign borrowings		
Provisions		
Tax liabilities		
Other liabilities		
Capital and reserves attributable to ordinary equity holders		
Core equity, Tier 1 (equity shares, retained earnings, nonredeemable noncumulative preference shares)		
Additional Tier 1 capital (minority capital, perpetual capital instruments)		
Tier 2 capital (asset revaluation reserves, general loss reserve provisions)		
TOTAL EQUITY AND LIABILITIES	100	100

Central Bank Funding

Borrowings from the central bank may appear among the bank's liabilities, most frequently if changes have occurred in the volume of required reserves as a result of fluctuations in deposits. These shifts occur when a bank has not correctly forecast its daily reserve position and has been forced to borrow to make up the difference or to help banks to meet temporary requirements for funds. Longer-term credit from the central bank indicates an unusual situation that may have resulted from national or regional difficulties or from problems related to the particular bank in question.

Historically, central bank financing was often directed toward a special purpose determined by government policies—for example, in the areas of agriculture or housing—but this type of activity is typical for lower-income countries and is becoming less frequent.

Financial Liabilities Held for Trading

Instead of resorting to direct borrowing, a bank may sell and simultaneously agree to repurchase securities at a specific time or after certain conditions have been met. Repurchase structures are often used to fund a bank's trading portfolio and to enhance returns on such portfolios.

The proprietary trading portfolio is therefore aimed at exploiting market opportunities with leveraged funding such as repurchase agreements, whereas the investment portfolio is held and traded as a buffer or stable liquidity portfolio—and funded with more stable deposits.

Repurchase agreements may expose banks to interest rate or market risks because they involve underlying securities—and even a credit risk if the buyer cannot follow through on its commitments. The level of securities sold under repurchase agreements has (in the past) also served as a barometer of the level of disintermediation in the system as well as of the demand for wholesale funds.

Financial Liabilities Measured at Amortized Cost

Deposits from other banks and financial institutions and deposits from customers constitute financial liabilities that are measured at amortized cost.

Deposits from banks and other credit institutions (interbank funding). These include all deposits, loans, and advances that are extended between banks and are normally regarded as volatile sources of funding. An analysis of interbank balances may point to structural peculiarities in the banking system—for example, when funding for a group of banks is provided by one of its members.

Given the volatility of such funding sources, however, if a bank is an extensive borrower, its activities should be analyzed in relation to any other aspects of its operations that influence borrowing. The acceptable reasons for reliance on interbank funding include temporary or seasonal loan or cash requirements and the matching of large, unanticipated withdrawals of customer deposits. Money centers or large regional banks engaged in money market transactions tend to borrow continuously. Otherwise, heavy reliance on interbank funding indicates that a bank carries a high degree of funding risk and is overextended in relation to its normal deposit volume.

Deposits from customers. Usually the largest proportion of a bank's total liabilities, deposits from customers—the amount due to other customers and depositors—represent money accepted from the general public, such as demand and savings, fixed and notice, and foreign currency deposits. The structure

and stability of the deposit base is critical. Broader trends also come into play. An analysis of private sector deposits (including funding from repurchase agreements and certificates of deposit) highlights economic trends related to the level of spending and its effect on inflation. Furthermore, growth in the money supply is calculated using total deposits in the banking system. A change in the level of deposits in the banking system is therefore one of the variables that influences monetary policy.

Within the deposit structure, some items are inherently riskier than others. For example, large corporate deposits are less stable than household deposits, not only because of their higher degree of concentration but also because they are more actively managed. A large proportion of nonretail or nonstandard deposits can be unstable and tends to indicate that the bank may be paying higher rates of interest than its competitors or that depositors may be attracted by liberal credit accommodations. Cash collateral and various types of loan escrow accounts may also be counted as deposits, although these funds can be used only for their stated purpose. In recent years, money laundering has attracted high interest, with new regulations focusing on nonstandard deposits and imposing policies and procedures requiring customer due diligence checks, accounts controls, and transaction information.

Competition for funds is a normal part of any banking market, and depositors—both households and corporations—often aim to minimize idle funds. A bank should therefore have a policy on deposit attraction and maintenance and procedures for regularly analyzing the volatility and the character of the deposit structure so that funds can be productively used even when the probability of withdrawal exists. Analysis of the deposit structure should determine the percentage of hard-core, stable, seasonal, and volatile deposits.

Foreign Borrowings

International borrowing may occur in the same form as domestic funding, except that it normally exposes a bank to additional currency risk. Direct forms of international borrowing include loans from foreign banks, export promotion agencies in various countries, or international lending agencies, as well as vostro accounts. Indirect forms include notes, acceptances, import drafts, and trade bills sold with the bank's endorsement; guarantees; and notes or trade bills rediscounted with central banks in various countries. The existence of foreign funding is generally a good indicator of international confidence in a country and its economy.

4.4 Equity and Other Items

Equity

The equity of a bank represents the buffer available to protect creditors against losses that may be incurred by managing risks imprudently. Table 4.3 illustrates the presentation and disclosure of equity in IFRS terms. According to international norms, banks normally have tiers of capital components, in addition to regulatory add-ons such as a capital conservation buffer, countercyclical capital instruments, and a leverage ratio. These items are further discussed in chapter 6.

Table 4.3 Components of a Bank's Equity

Equity	Period 01	Period 02
Tier 1 capital		
Common shares		
Retained earnings		
Disclosed reserves		
Additional Tier 1 capital		
Perpetual capital instruments		
Minority capital		
Tier 2 capital		
Subordinated term debt		
General provisions		
Loss reserves		
Capital conservation buffer		
Countercyclical capital instruments		
Leverage ratio		
TOTAL LIABILITIES, MINORITY INTEREST, AND EQUITY	**100%**	**100%**

Off-Balance-Sheet Items

Financial innovation has also led to a variety of new off-balance-sheet financial instruments. The costs associated with monetary policy regulations, such as minimum reserve and capital adequacy requirements, have frequently been circumvented by the use of off-balance-sheet instruments. Credit substitutes (such as guarantees and letters of credit) and derivative instruments (such as futures and options) do not count as assets or liabilities, even though they expose the bank to certain risks and hence carry a capital requirement.

It is a challenge to manage risks in relation to such off-balance-sheet items. Consequently, it is important that management information accurately reflect

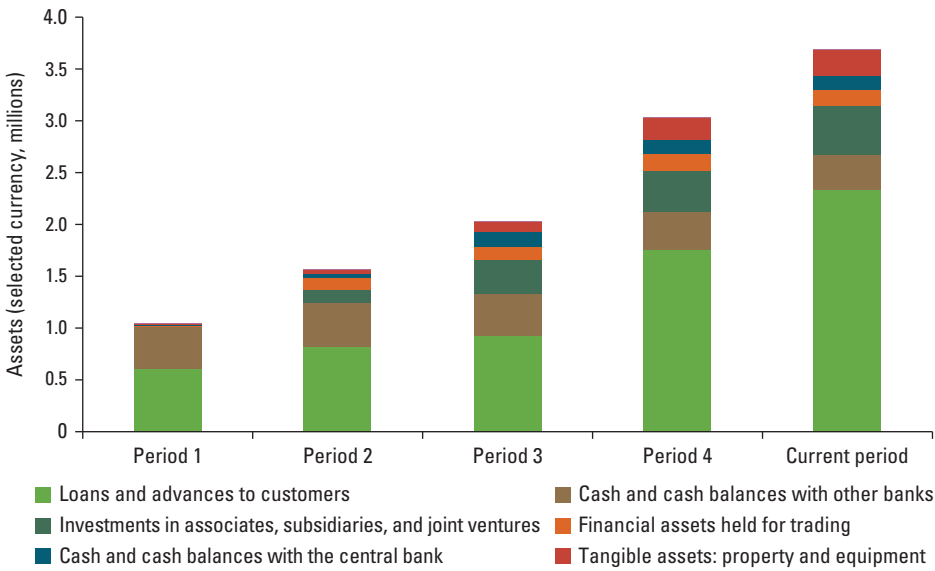
exposure in relation to these instruments. As part of managing such risks, it is important that the extent of the liability or right be quantified. This can be accomplished by assessing the nature, volume, and anticipated use of credit commitments, contingent liabilities, guarantees, and other off-balance-sheet items. Sensitivity to market changes that affect such instruments should also be determined in the context of the overall risk to the company.

4.5 Growth and Changes in the Balance Sheet

The banking sector's assets comprise items that reflect individual banks' balance sheets, although the structure of balance sheets may vary significantly. Figures 4.2 and 4.3 show two ways of illustrating the structure and growth of a bank's asset components over different periods. Figure 4.4 illustrates the structural change and growth of capital and liabilities.

An analyst can assess the bank's risk profile by analyzing the relative share of various elements of the asset structure and the changes in proportionate share over time. For example, if the loan portfolio jumps from 43 percent to 58 percent of on-balance-sheet assets from two years ago to the current period

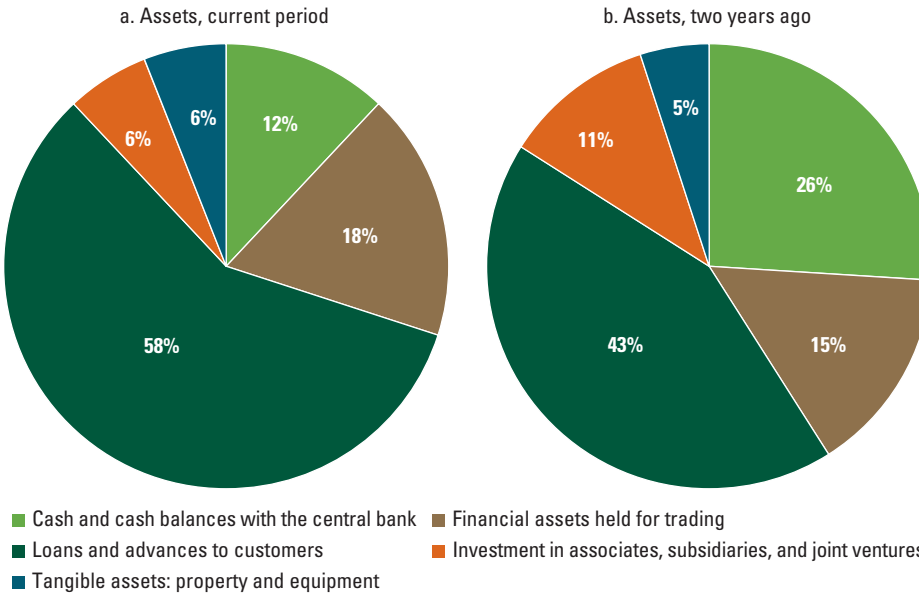
Figure 4.2 Five-Year Analysis of a Bank's Structural Change and Asset Growth



(figure 4.3), the question arises of whether the bank's credit risk management systems are adequate for the increased volume of loan transactions in the loan portfolio. Such a change would also disclose a shift from another risk area. Likewise, an increase or decrease in trading securities indicates a change in market risk exposure.

Such observations may even precede a detailed review of credit risk or market risk management. When linked to the amount of net income yielded by each asset category, this analysis becomes more important, necessitating a challenging assessment of risk versus reward.

Figure 4.3 Two-Year Changes in the Structure of a Bank's Assets



4.6 Risk Analysis of the Balance Sheet Structure and Growth

As noted in chapter 3, a bank that is well positioned and successful in its market can be expected to grow. To help ascertain that potential, a balance sheet analysis of the bank's growth rates, the nature of its assets and liabilities, and its structural changes over time is illustrative (table 4.4).

Even when overall growth is not significant, balance-sheet components normally shift in reaction to market, economic, or regulatory changes (as figures 4.2 to 4.4 illustrate). With changes in the balance sheet structure also come changes in inherent risks. Hence such an analysis is key to assessing the adequacy and effectiveness of a bank's policies and procedures for managing risk exposures.

Figure 4.4 Five-Year Analysis of a Bank's Structural Change and Growth of Capital and Liabilities

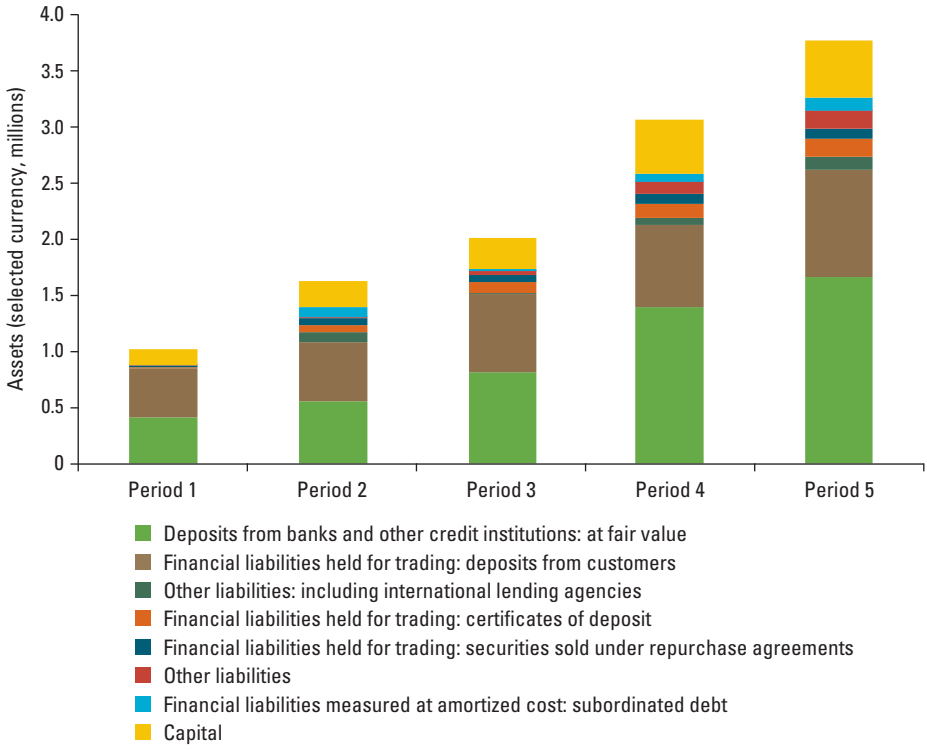


Table 4.4 Spreadsheet of Five-Year Total Growth of Balance Sheet and Off-Balance-Sheet Items

Asset category	Period 1	Period 2	Period 3	Period 4	Current period
Total assets (% growth from Period 1)	100	120	150	190	258
Risk-weighted assets (% growth from Period 1)	100	160	205	295	370
Qualifying capital (% growth from Period 1)	100	205	254	295	315
Off-balance-sheet items (% of total assets)	1.09	1.39	15.89	24.62	24.92

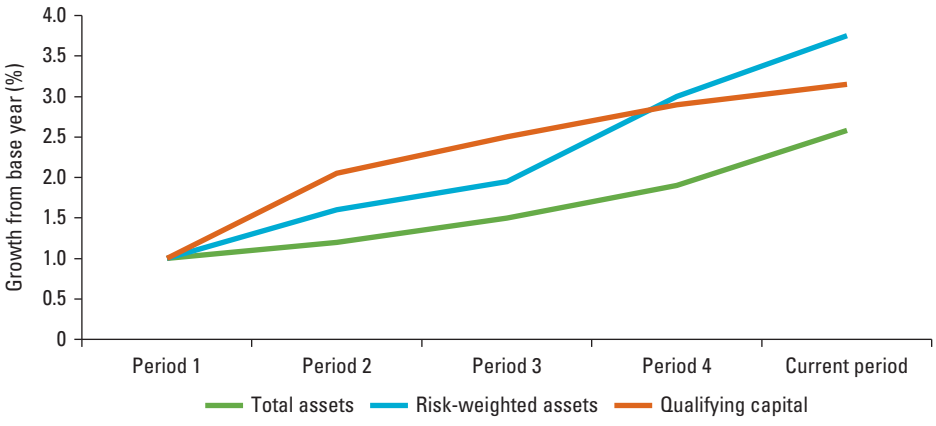
Mismatches

Asset-liability mismatches can occur in several areas. A bank could have substantial long-term assets (such as fixed rate mortgages) funded by the short-term liabilities (such as deposits). This creates a maturity mismatch that increases liquidity risk. Alternatively, a bank could have all of its liabilities as floating-interest-rate bonds but the majority of its assets in fixed-rate instruments. This creates an interest rate mismatch. Or, a bank that chooses to borrow entirely in one currency and lend in another currency would have a significant currency mismatch. Such mismatches are normally handled by the asset-liability management functions (further discussed in chapter 12).

Figure 4.5 illustrates the overall growth of a bank's assets and capital. It also highlights the extent to which a bank's growth is balanced—that is, the extent to which the bank has been able to maintain regulatory capital requirements in relation to total assets and risk-weighted asset growth. A graph of this kind could provide an early indicator of capital adequacy problems to come, which in turn could result from rapid expansion.

In normal situations, the growth of a bank's assets is justified by an increase in the stable funding base at an acceptable cost to the bank as well as by profit opportunities. The spread between interest earned and interest paid should normally be stable or increasing. In a stable market environment, increasing margins may indicate the acceptance of higher risk. To avoid increased lending risk, emphasis is often placed on fee-generating income, which does not involve a bank's balance sheet.

Figure 4.5 Five-Year Total Growth of a Bank's Assets and Capital from a Base Year



Banks that grow too quickly tend to take unjustified risks and often find that administrative and management information systems cannot keep up with the rate of expansion. Even well-managed banks can run into risk management problems arising out of excessive growth, especially concerning their loan portfolios.

In some countries, monetary policy conduct may limit or significantly affect the rate of growth and the structure of a bank's assets. Despite the shift away from reliance on portfolio regulations and administrative controls, credit ceilings have been and still are a relatively common method of implementing monetary policy in some transitional economies, especially in countries with less-developed financial markets. An alternative method of indirectly manipulating the demand for and level of credit in the economy has traditionally been to influence the cost of credit.

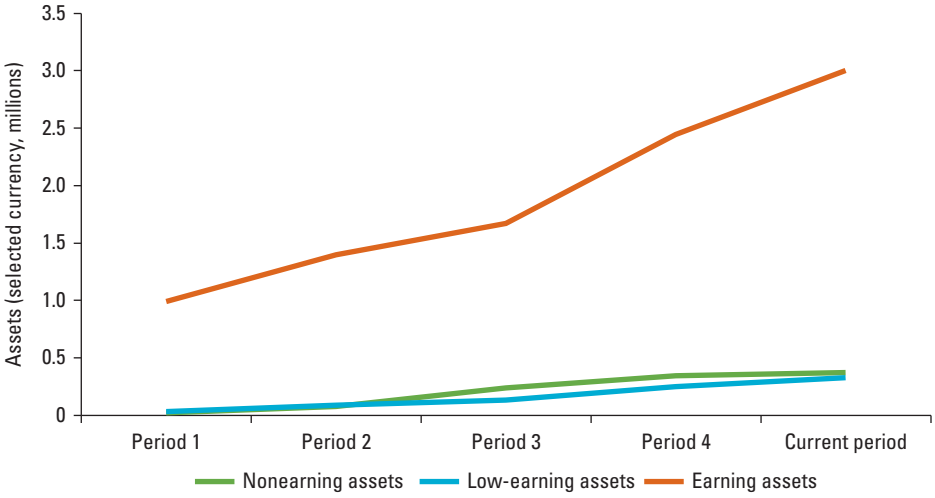
Changes in banking and finance mean that the scope for circumventing credit ceilings and interest rate regulations has increased significantly. A loss of effectiveness—and concerns over the distortions that credit ceiling and interest rate manipulations generate—are the reasons why these instruments are increasingly abandoned in favor of open-market interventions. The use of credit ceilings in countries where such monetary policies have been pursued for long periods may have reduced the competitiveness of banks and encouraged innovation and the creation of alternative instruments and channels of financial intermediation. In other words, credit ceilings have inadvertently shaped the evolution of banking systems.

Low-Earning and Nonearning Assets

Banks clearly need to keep a reasonable risk profile on a profitable basis. Determining the causes of declining net interest margins must include the assessment of the level of low-earning or nonearning assets, particularly those with high risk. Figure 4.6 provides a sample picture of the changing level, over time, of low-earning and nonearning assets. The proportion of these assets in the bank's total assets has increased significantly during the periods under observation.

This trend should be analyzed not only in relation to industry benchmarks or averages but also within the context of changes over time. In this particular case, growth may have resulted from changes in the regulatory environment or in the bank's funding structure, whereby the bank may have increased the proportion of funding subject to regulatory requirements. It could also have resulted from poor asset management decisions. In many transitional

Figure 4.6 Five-Year Trend of Low-Earning and Nonearning Assets



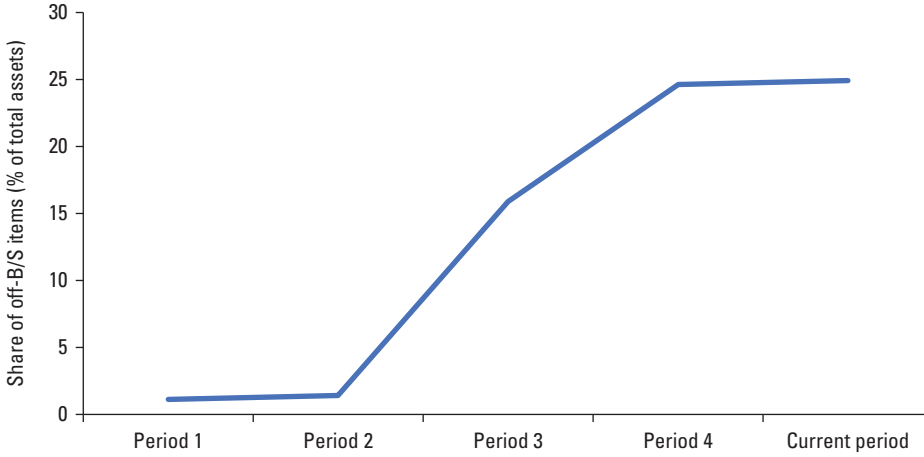
economies, this asset category reflects forced holding of recapitalization bonds issued by governments to save their banking systems.

Off-Balance-Sheet Growth

Figure 4.7 similarly illustrates off-balance-sheet growth. This graph can be used to determine the growth of off-balance-sheet items and the proportion of such items in total on- and off-balance-sheet activities.

The graph illustrates that this bank is obviously increasing its off-balance-sheet activities, although the notional value of many off-balance-sheet instruments may not be directly related to the extent of risk exposure. An analyst should understand why and exactly which instruments have supported this significant trend. Because the off-balance-sheet items do expose a bank to financial risks, a few questions arise, including the risk implications of different instruments not shown on the balance sheet. In addition, it is not known whether the return to the bank is equal to the additional risk taken or whether the bank has in place an adequate risk management system for off-balance-sheet exposures.

Figure 4.7 Five-Year Trend of Off-Balance-Sheet Items as a Percentage of Total Assets



Notes

1. For further definition of these terms, see "IFRS 9 Financial Instruments," International Accounting Standards Board (IASB) website: https://www.ifrs.org/issued-standards/list-of-standards/ifrs-9-financial-instruments/. For more information about all issued standards, see "List of IFRS Standards," IASB website: https://www.ifrs.org/issued-standards/list-of-standards/.
2. IAS 39 ("Financial Instruments: Recognition and Measurement") was an international accounting standard that outlined the requirements for the recognition and measurement of financial assets, financial liabilities, and some contracts to buy or sell nonfinancial items. Released by the International Accounting Standards Board (IASB) in 2003, it was replaced in 2014 by International Financial Reporting Standard (IFRS) 9, which became effective in 2018.
3. For the foundational documents of Basel I, II, and III, see the reference list entries, respectively, for BCBS 1988, 2004, and 2011.

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5

Income Statement Structure

KEY MESSAGES

- Income and earnings are indicators of a bank's capacity to carry risk or to increase its capital.
- Supervisory authorities welcome profitable banks as contributors to stability of the banking system.
- Profitability ratios should be seen in context, and the potential yield on the "free" equity portion of capital should be deducted before drawing conclusions about profitability.
- The components of income could change over time, and core costs should be compared with assumed core income to determine whether such costs are indeed fully covered.
- Management should understand which assets they are spending their energy on and how this relates to the income generated from such assets.

5.1 Profitability

Profitability, in the form of retained earnings, is typically one of the key sources of capital generation. A sound banking system is built on profitable, adequately capitalized banks. Profitability is a revealing indicator of a bank's competitive position in banking markets and of the quality of its management. It allows a bank to maintain a certain risk profile and provides a cushion against short-term problems.

The income statement, a key source of information on bank's profitability, reveals the sources of a bank's earnings and their quantity and quality as well as the quality of the bank's loan portfolio and the key elements of its expenditures. Income statement structure also indicates a bank's business orientation. Traditionally, the major source of bank income has been interest, but the increasing orientation toward nontraditional business is also reflected in

income statements. However, income from trading operations, investments, and fee-based income account for an increasingly high percentage of earnings in modern banks. This trend implies higher volatility of earnings and profitability. It also implies a different risk profile from that of traditional banks.

Changes in the structure and stability of banks' profits have sometimes been motivated by statutory capital requirements and monetary policy measures such as obligatory reserves. To maintain the public's confidence in the banking system, banks are subject to minimum capital requirements. The restrictive nature of this statutory minimum capital may cause banks to change their business mix in favor of activities and assets that entail a lower capital requirement. However, although such assets carry less risk, they may earn lower returns. Excessive obligatory reserves and statutory liquidity requirements damage profits and may encourage disintermediation. They may also result in undesirable banking practices. For example, the balance sheets of banks in many low- to middle-income and transitional economies contain large proportions of fixed assets, a trend that adversely affects profitability. Regulatory authorities should recognize the importance of profits and, to the extent possible, avoid regulations that may unduly depress profitability.

Taxation is another major factor that influences a bank's profitability, as well as its business and policy choices, because it affects the competitiveness of various instruments and different segments of the financial markets. For example, taxation of interest income, combined with a tax holiday for capital gains, can make deposits less attractive than equity investments. In general, banks adjust their business and policy decisions to minimize the taxes to be paid and to take advantage of any loopholes in tax laws. Beyond the level and the transparency of profit taxation, key areas to consider when assessing the business environment and profit potential of a bank are whether and how fiscal authorities tax unrealized gains and interest income as well as whether they allow provisions before taxation. Many fiscal authorities also apply direct taxes to banking transactions.

A thorough understanding of profit sources and changes in the income and profit structure of both an individual bank and the banking system as a whole is important to all key players in the risk management process. Supervisory authorities should, for example, view bank profitability as an indicator of stability and as a factor that contributes to depositor confidence. Maximum sustainable profitability should therefore be encouraged because healthy competition for profits is an indicator of an efficient and dynamic financial system.

5.2 Income Statement Composition

A bank's statement of comprehensive income (the income statement) is a key source of information regarding the sources and the structure of its income. An example of an income statement is shown in table 5.1.

Table 5.1 Income Statement Composition

Financial and operating income and expenses	Period 1	Period 2
Interest		
Interest and similar income		
Interest expense and similar charges		
Net interest income before impairment of advances		
Impairments		
Net interest income after impairment of advances		
Noninterest revenue		
Fees and commissions		
Fair value gains or losses		
Gains less losses from investing activities		
Operations		
Income from operations		
Operating expenses (including provisions)		
Net income from operations		
Other		
Share of profit or loss of associates and joint ventures		
Income before tax		
Tax expense		
PROFIT for the year		

Interest and Similar Income

Interest income originates from loans and all other advances extended by a bank, such as working capital, investment, mortgage and foreign currency loans, installments, overdrafts, and credit cards. It also includes interest received on the bank's deposits kept with other financial intermediaries. Interest income is normally calculated on an accrual basis, meaning that a bank calculates interest due over the period of time covered by the income statement, regardless of whether the interest has been paid. Accounting policies should normally require that a loan be placed in a nonaccrual status if a client is overdue by a

specified period of time (say, 60 days) or deemed to be potentially unable to pay (regardless of whether the loan is overdue). At that point, all previously accrued but unpaid interest should be reversed out of income. The absence of such a policy normally results in largely overstated interest income and profits.

For management purposes, interest income would normally be further subdivided by sources of income. For example, loan categories can be subdivided into loans to the government, to state enterprises, and to private enterprises (including working capital loans and investment loans categories), as well as consumer loans to households, mortgage loans, and so on. This subdivision is required for supervisory or statistical purposes. It may also be the result of a bank's own internal organization because modern, cost-conscious banks often develop elaborate pricing and costing systems for their various business and product lines to ensure that the contribution of each product to the bottom line is clearly understood.

Interest Expense and Similar Charges

Interest expense comprises interest paid on deposits and borrowings related to funding the loan portfolio. A breakdown of interest expenses provides an understanding of a bank's sources of funding and of the corresponding funding cost. The subdivision of interest expense is typically based on both instruments and maturities, such as demand deposits, saving accounts, foreign currency deposits, and certificates of deposit.

A bank with low interest expense and thus low funding costs is clearly better positioned than one with high interest expense because it would be able to lend at market rates with a higher interest margin. The smaller interest expense, however, often involves higher operating expenses. For example, household deposits typically involve lower interest expense but require branch networks to collect them, and the maintenance of deposit accounts is expensive. This is why some banks prefer funding by wholesale deposits, even if this implies higher interest expense.

Net Interest Income

Net interest income is the difference between a bank's interest income and interest expense. The net interest income is the core of traditional bank's earnings, and the bank would normally aim to keep the net interest income stable and growing. In a floating interest rate environment, this requires active management: banks normally try to adjust lending rates before deposit rates in rising interest-rate markets, and they do the opposite in falling markets.

Impairment Losses

Impairment expenses relate to loss provisions for all other assets where the value of the asset could be impaired, such as the assets in a bank's long-term investment portfolio. In many countries, prudential requirements mandate that a bank carries assets at the lower of the nominal value or the market value (in which case loss provisions need to be made) and recognize any appreciation in value only when the investment is liquidated.

Noninterest Revenue

Fair value gains or losses (through the income statement). Gains or losses on financial assets and liabilities held for trading comprises income from trading and from investments in securities, foreign currencies, equities, and commodities. This income is mostly because of the difference between the purchase and sale price of the underlying instruments, but it also includes interest amounts. The stability or sustainability of trading income affects a bank's viability and is critically related to the quality of its market risk management function, the effectiveness of the corresponding functional processes, and proper information technology (IT) support. Trading assets would normally be disclosed at fair value (mark-to-market adjustments will flow through the income statement) in the bank's financial statements (see chapters 10 and 16).

Other financial assets are also disclosed at fair value, but mark-to-market adjustments are recorded through other comprehensive income.

Other operating income. Other operating income, such as knowledge-based or fee-based income, includes income received from nontraditional banking business such as merchant banking or financial advisory services. This category also includes fee-based income derived from various services to clients, such as accounts or funds management services and payment transaction services. This class of income is generally desirable because it does not inherently carry any capital charges.

Exchange differences. In low- and middle-income countries, where banks are frequently funded by foreign loans, exchange differences often appear in the banks' income statements. Gains or losses result from exchange rate changes that—depending on whether a bank's net position was long or short and whether the domestic currency has depreciated or appreciated—produce a gain or loss to the bank.

Operating Expenses

Administration costs. Salaries and staff-related expenses (such as social security, pensions, and other benefits) are normally the largest cost item for a bank because banking is a knowledge- and staff-intensive business. Computers and IT-related expenses (such as software licenses and application system development and maintenance expenses) have also become major cost items, especially in modern or internationally active banks that are critically dependent on information support for identifying market opportunities, transaction processing, and risk management and management reporting. Administrative expenses also include costs related to rent and utilities, auditing, and consulting expenses.

Efficient management of these expenses requires balancing short-term cost minimization strategies with investments in human and physical resources—especially the banking technology necessary for effective management of banking risks and for the long-term maintenance of the bank's competitive position. Besides loan loss provisions, administrative (operating) expense is the item with the most significant impact on the cost of intermediation, and it is also one of the most controllable items. The level of operating expenses is generally related to a bank's efficiency.

Depreciation. Depreciation results from the reduction in value of a bank's fixed assets. It is conceptually similar to provisions. Banks typically depreciate buildings over 25–50 years, movable assets and office equipment over 3–5 years, and computers over 2–3 years.

Provisions. Loan loss provisions are expenses related to the credit risk inherent in granting loans and advances. Provisions are made to compensate for the impaired value of the related loan principal and interest due. This may include write-offs and recoveries (that is, amounts recovered on loans previously written off), which may be shown as separate line items in the income statement.

Share of the Profit or Loss of Associates and Joint Ventures

This category comprises income from a bank's longer-term equity-type investments, such as investments in associated companies and joint ventures held in the bank's long-term investment portfolio. Investment income depends on the respective contractual rates and, for equity investments, on the financial performance of the respective companies. By its nature, the income from equity investments is difficult to accurately predict. Investment assets would be shown on the balance sheet as "investments in associates, subsidiaries, and joint ventures."

5.3 Analyzing the Sources of Banking Income

Markets that have traditionally been the sole domain of banks have opened up to competition from other institutions. Banks in turn have diversified into nontraditional markets and therefore no longer perform only a simple intermediation function (that is, deposit taking and lending). In fact, an overview of the industry's profit structure in most high-income countries reveals that the traditional banking business is only marginally profitable and that income from other sources has become a significant contributor to the bottom line. Bank profitability appears to be largely attributable to fee income generated from knowledge-based activities (including merchant banking, corporate financing, and advisory services) and from trading-based activities in fixed-income securities, equities, and foreign exchange.

The information in a bank's income statement provides an understanding of the institution's business focus and the structure and stability of its profits. To facilitate a comparison between different types of banking institutions, various income statement items—such as interest margins, fee and investment income, and overhead—are usually expressed as a percentage of total assets. By using the asset base as a common denominator, banks can compare themselves with the sector average and with other types of banks. When aggregated, such information can also highlight changes that occur within a peer group or the banking sector.

When analyzing a bank's income structure, an analyst should appropriately consider and acquire an understanding of the following aspects:

- Trends in and the composition and accuracy of reported earnings
- The quality, composition, and level of income and expense components
- Dividend payout and earnings retention
- Major sources of income and the most profitable business areas
- The manner and the extent to which accrued but uncollected interest is absorbed into income, in particular when such interest relates to loans that are or should be placed in risk categories of substandard or worse
- The extent to which collateral values (rather than operating cash flows) are the basis for decisions to capitalize interest or roll over extensions of credit
- Any income or expenditure recognition policies that distort earnings
- The effect of intergroup transactions, especially those related to the transfer of earnings and asset-liability valuations.

By changing the sequence of income statement items (table 5.2), the analyst can determine the contribution of each of the different sources of banking income—and hence assess the importance of retail lending versus trading and investment banking activities.

In the "current period" column of the example in table 5.2, the various components of income and expenses (even gross interest income and gross interest expenses) are disclosed as a percentage of gross income (line item 5). Net interest income is calculated as the difference between gross interest income and interest expenses related to the loan portfolio and can be seen to make a

Table 5.2 Income Statement, Highlighting Components of Gross Income and Net Income

Component	Current period	Prior period
A: Interest and similar income on loan portfolio and interbank deposits	205	
B: Interest expenses on deposits and loan portfolio funding instruments	170	
Income		
1. Net interest income on loan portfolio (A – B) (% gross income)	35	
2. Other banking-related operating income (% gross income)	20	
3. Trading-related income (% gross income)	41	
4. Investment-related income (subsidiaries and associates) (% gross income)	4	
5. Gross income (%)	100	
Expenditures		
6. Specific loan loss provisions and write-offs (% gross income)	6	
7. Operating expenses (% gross income)	55	
8. Expenses related to trading and investment activities (% gross income)	20	
9. Other expenses and interest related to nondeposit borrowings (% gross income)	5	
10. Net before-tax income (or loss) (% remainder of gross income after expenditures)	14	
Taxes		
11. Income tax (%)	7	
Effective tax rate (%)	50	
Distribution of net after-tax income (or loss)		
12. Net after-tax income (or loss) (%)	100	
Transfers to general provisions (% net income or loss)	46	
Dividends declared (% net income or loss)	14	
Other (% net income or loss)	0	
Retained earnings for the period (% net income or loss)	40	

relatively minor contribution to overall income—especially when the volume of activity to generate the net interest income is considered.

5.4 Analyzing Quality of Earnings

The change in the income structure of banks has had the effect of improving profitability without increasing the traditional credit risk that results from loan portfolios. For example, many corporate clients can attract funding in their own names through the issuance of commercial paper and bonds. Instead of maintaining large corporate loans on their balance sheets, banks increasingly underwrite or service issues of their large corporate clients or perform a market-making function. Doing so generates fee income without increasing credit risk exposure. However, income generated in this manner (for example, through securities trading and merchant banking) is by its nature less stable and predictable because it depends on market conditions and trading performance. The trading portfolio is also subject to market risk (discussed in chapter 10), which can be quite substantial.

Analysis of Income Structure

The analysis of earnings quality starts by considering the structure of a bank's income and its components—interest income, transactions-based fee income, trading income, and other sources of income—and the trends over the observation period. Figure 5.1 illustrates the composition of a bank's gross income. (Note that the various figures in this chapter are used as illustrations and do not necessarily refer to the same bank.) Such a chart enables an analyst to determine the quality and stability of a bank's profit, including its sources and any changes in its structure. This bar graph shows that the bank's trading and investment income has become an increasing contributor to its gross income, while the contribution of interest income has decreased.

Such tendencies normally require scrutiny because, under normal circumstances, investment income is less stable than interest income. However, the trend may have been motivated by adverse changes in the bank's macroeconomic or market environment, which would provide good reasons for such an orientation. Another reason would be that the return on investments has been significantly higher than the return on loans. Comparison of the gross income structure and the asset structure normally provides a reasonable basis for an answer to this anomaly. The analysis of income structure may also yield conclusions regarding the quality of asset management.

Figure 5.1 Five-Year Structure of a Bank's Gross Income

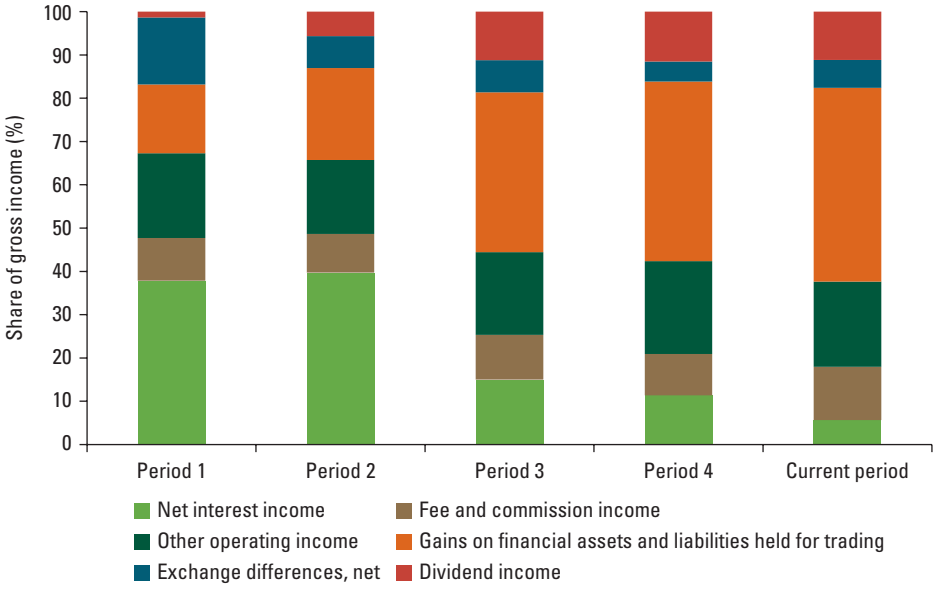
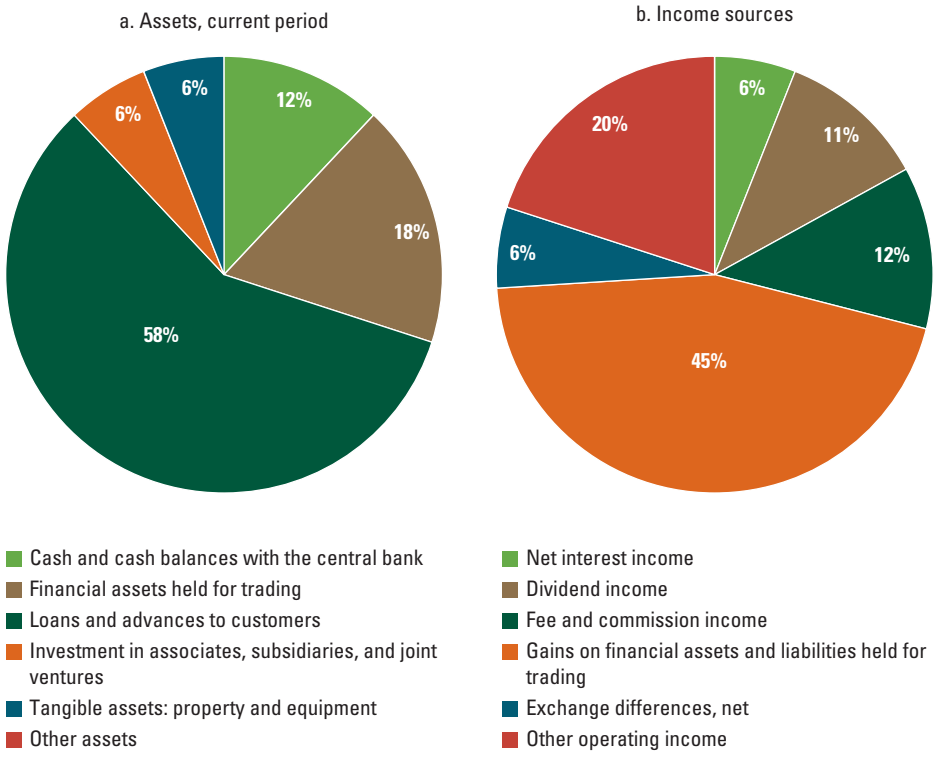


Figure 5.2 illustrates this process by comparing the composition of various asset categories with the composition of gross income. The purpose of this comparison is to determine exactly how the assets of a bank are engaged and whether the income generated is commensurate with the proportion of assets committed to each specific asset category. (In other words, is the income earned where the energy is spent?) Assets should normally be engaged in product categories that provide the highest income at an acceptable level of risk. The same analysis can be performed to identify categories of loans and advances that generate proportionately lower yields.

An analytical comparison of classes of interest expenses with related liability categories highlights a bank's exposure to specific sources of funding and reveals whether structural changes are taking place in its sources of funding. A similar type of graph and analysis can be used to assess whether the components of interest expense in the total expenditures are of the same proportions as the related liabilities. Expensive categories of funding would be clearly highlighted on such a graph, and the reasons for the specific funding decisions would need to be explained. In the long term, this type of analysis could highlight whether and what sort of structural changes are occurring in a bank's income and expenditure structure and whether they are justified from the profitability perspective.

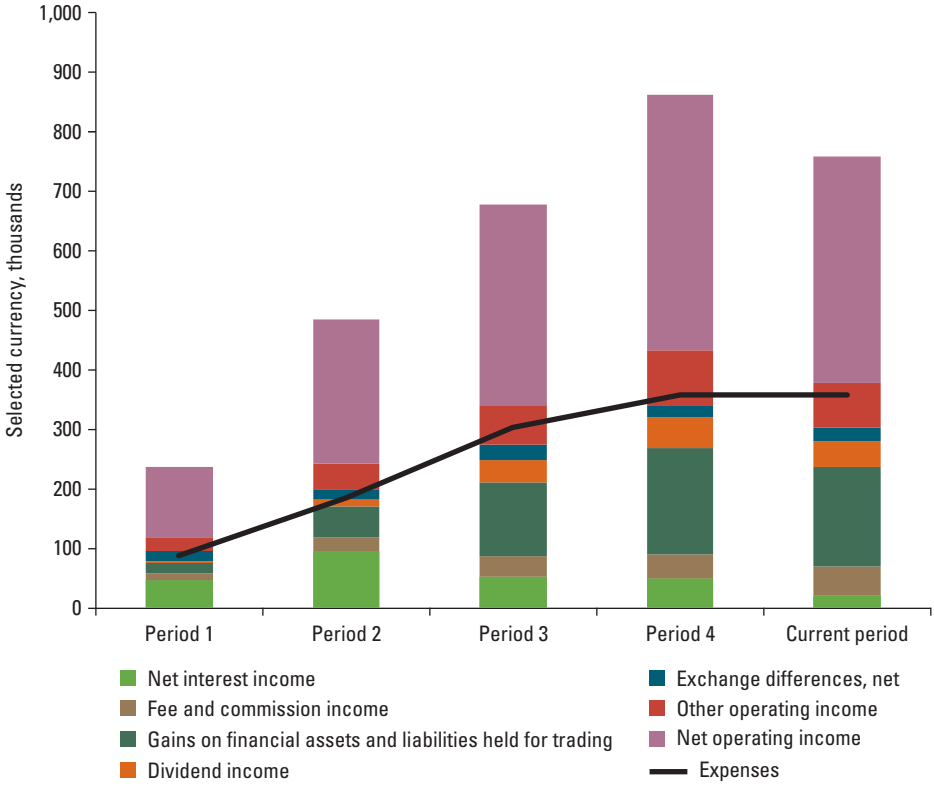
Figure 5.2 Comparison between a Bank's Assets Invested and Sources of Income



Analysis of Operating Expenses

Figure 5.3 illustrates the next step: the analysis of how a bank's income covers its operating expenses. In the case illustrated, the fee income and trading income significantly contribute to the bank's profitability and to its capacity to carry the operating cost. The stability of the bank's income has likely deteriorated, because fee and trading income are generally considered to be less stable than net interest (that is, intermediation) income. Both the gross income and the operating expenses have shown significant growth in the observation period. In spite of the much higher income level, the bank's bottom line does not appear to have improved. The analysis should determine the reason for the significant increase in operating expenses.

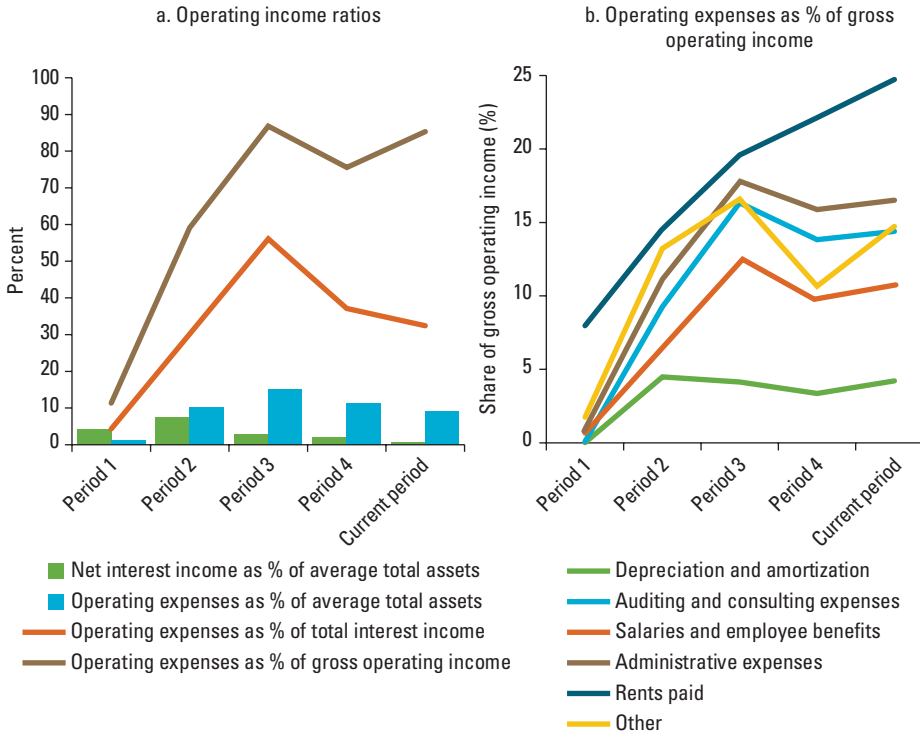
Figure 5.3 Analysis of a Bank's Income Sources versus Costs



Operating expenses is one of the items on a bank's income statement that can be controlled. One acceptable reason for an increase in operating expenses would be investments in human resources and banking infrastructure, which could be expected to pay off in the future. If no such reasons can be found, the bank should be asked to rethink its business strategy.

Figure 5.4 illustrates another view of trends in operating expenses relative to total assets, gross interest income, and gross operating income that could provide the analyst with information on the relationship between a bank's expenses and earning capacity as well as on whether the bank has optimized its potential. Income and expenses are presented in relation to total assets. When compared with industry norms, such a view can yield important conclusions—for example, that a bank's expenses are high because it is overstaffed. The ratios of operating expenses to interest income and to gross operating income are also useful, because they clearly indicate the bank's profitability.

Figure 5.4 Operating Income and Expense Ratios



5.5 Analysis of Profitability Indicators and Ratios

Profit is the bottom line or ultimate performance result showing the net effects of bank policies and activities in a financial year. Its stability and growth trends are the best summary indicators of a bank's performance in both the past and the future.

Usefulness of Profitability Ratios

Key indicators include the *return on average equity* (which measures the rate of return on shareholder investment) and the *return on assets* (which measures the efficiency of use of the bank's potential). Other ratios measure the profitability of the bank's core business (for example, margin ratios); the contribution to profit of various types of activities; the efficiency with which the bank operates; and the stability of its profits. Ratios are observed over time to detect profitability trends. An analysis of changes of various ratios over time reveals changes in bank policies and strategies as well as in its business environment. The most frequently used profitability ratios are shown in table 5.3.

Table 5.3 Frequently Used Bank Profitability Ratios

Profitability ratios	Prior period	Current period	Benchmark
Net interest income as percentage of average total assets			
Interest income as percentage of average earning assets			
Noninterest income as percentage of average total assets			
Net interest income net of provisions as percentage of total assets			
Interest expense as percentage of average total assets			
Intermediation spread			
Net interest income (net of provisions) as percentage of gross operating income			
Loan loss provisions as percentage of average total assets			
Dividends as percentage of net income after tax			
Return on average equity (pretax)			
Return on average equity (posttax)			
Return on average assets (pretax)			
Return on average assets (posttax)			
Operating expenses as percentage of gross operating income			
Staff costs as percentage of gross operating income			
Other operating income as percentage of gross operating income			
Other operating expenses as percentage of average total assets			
Total interest expense as percentage of average interest-bearing liabilities			
Interest on subordinated debt as percentage of average subordinated debt			
Noninterest income as percentage of operating income			

Numerous factors may influence a bank's profitability. In some cases, inflation may increase operating costs faster than income. Marking the value of assets to market requires that unrealized gains be recognized as income; because these gains are yet to be realized, this may negatively affect the quality of earnings. Given the typically narrow margin on which banks operate, a change in interest rates will trigger changes in the gross profit percentage. Banks are influenced by the high competitiveness in the banking sector, and many have therefore made significant investments in infrastructure-related assets—especially IT—as part of their competition strategy. Investments such as these have both increased the overhead cost of banking and negatively affected profitability.

Viewed in the context of the financial aspects to which they are related, profitability ratios enable an analyst to assess the efficiency with which an institution generates income. Industry efficiency norms facilitate a comparison between individual banks and the banking system. A review of interest income

in relation to loans and advances allows an analyst to determine the return on the loan assets. Similarly, a comparison of interest expenses and funding indicates the relative cost of funding. This process highlights the impact of monetary policy on the banking system and the effect that changes in official interest rates have on the profitability of a bank.

The ratios can also be used in a broader context. The cost and revenue structure of the banking system can be assessed by calculating and analyzing provisions to loans and advances, interest margin to gross interest income, investment income to investments, and overhead to gross income. The value added by the banking system can be determined by calculating net income after taxes in relation to total average assets (that is, the return on average assets) and net income after taxes in relation to owner equity (that is, the return on equity).

Role of Asset-Liability Management to Limit Risk

Bankers pay great attention to the message revealed by ratio analysis. Banks usually manage profitability by trying to beat market averages and keep profits steady and predictable; this in turn attracts investors. Ratios are therefore extremely useful tools, but as with other analytical methods, they must be used with judgment and caution because they alone do not provide complete answers about the bottom-line performance of banks. In the short run, many tricks can be used to make bank ratios look good in relation to industry standards. An assessment of the operations and management of a bank should therefore be performed to provide a check on profitability ratios.

The need to generate stable and increasing profits also implies the need to manage risk. Asset-liability management has become an almost universally accepted approach to profitability (risk) management. Because capital and profitability are intimately linked, the key objective of asset-liability management is to ensure sustained profitability so that a bank can maintain and augment its capital resources. Interest margins can be negatively affected by the bank's failure to effectively manage credit risk.

Strong, stable net interest margins have traditionally been the primary objective of bank managers, and they are still the primary determinant of intermediation efficiency and earning performance. An analysis of a bank's interest margin can highlight the effect of current interest rate patterns, while a trend analysis over a longer period can show the effect of monetary policy on the profitability of the banking system. It can also illustrate the extent to which banks are exposed to changes in interest rates and thus the ability of management to effectively manage interest rate risk.

Figure 5.5 Average Yield Differential on a Bank's Intermediation Business

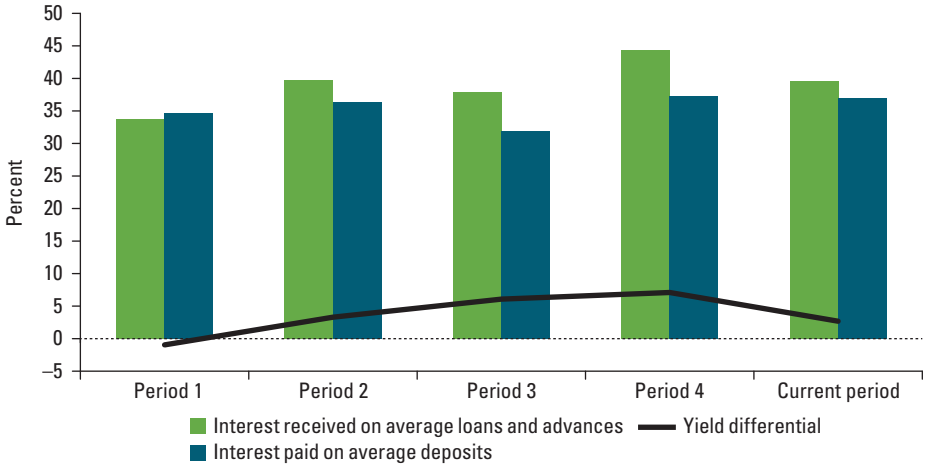


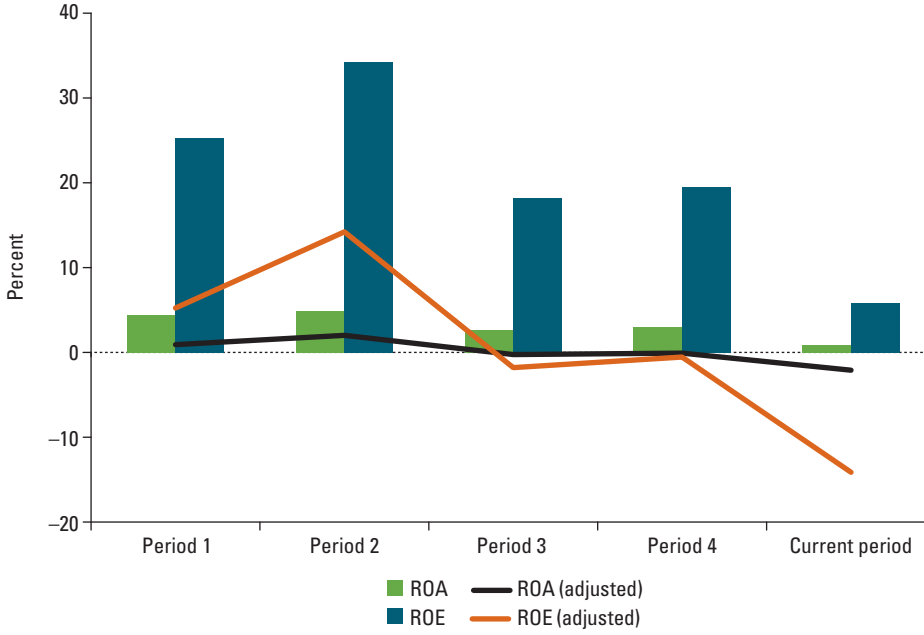
Figure 5.5 illustrates the intermediation performance of a bank. The net interest margin of the bank has shown a steady increase and then a significant deterioration in the recent period. Such a trend demands further analysis. The analyst should establish whether the decline occurred for systemic reasons—for example, if the interest margins were reduced as a result of increased competition. The reduction of interest margins, however, could also have resulted from an increase in the cost of funds. Such a trend would negatively affect profitability and ultimately may even affect the bank's solvency.

Adjusting the Profitability Ratios

Bottom-line profitability ratios—the return on equity and assets—indicate the net results of a bank's operations in a financial year or over time. Figure 5.6 illustrates how to adjust these profitability ratios by deducting an assumed cost of capital to show the real profit of a bank.

By comparing the return on equity with the after-tax return on risk-free government securities, one can determine whether equity invested in the bank has earned any additional returns compared with risk-free investments. The result, such as the one shown in figure 5.6, may disclose that it could be better for shareholders to simply invest in risk-free government securities or for the bank to cease its intermediation function and close its doors.

Figure 5.6 Trends in Return on Assets (ROA) and Return on Equity (ROE), Adjusted for the Cost of Capital



5.6 Assessing Internal Performance

In such an intensively competitive business, modern banks can no longer afford to carry insufficiently profitable products, services, or lines of businesses. International banks and financial conglomerates especially must organize their functions in a way that enables them to establish the exact contribution to the bottom line of their many constituent parts. In the past decade, more refined systems for profitability and performance measurement have been developed to address this need.

The conclusions drawn by internal performance measurement systems directly affect the products offered and their pricing, hence shaping the bank's entry and exit decisions concerning particular products or services. Internal measurement techniques usually consider the underlying risk elements (which may negatively affect the bank's expenses) and therefore also contribute to enhancing risk management techniques. A good measurement system will also enhance the application of a consistent incentive compensation system, based

on achievement rather than on hierarchy. The framework for such a system comprises several elements:

- *An effective organization* that allows a clear allocation of income and expenses to business units related to different lines of a bank's business, products, and market segments
- *An internal transfer pricing system* to measure the contribution of various business units to the bottom line
- *An effective, consistent means to incorporate the respective risk elements* into the performance measurement framework.

Allocation of income and expenses to business units. Once the net contributions are known—by business lines, products, or markets—it can be clearly established which customer segments are the most promising and which products should be scrutinized concerning their revenue-generating capacity. A good performance measurement framework also allows for analysis of the net contribution that a relationship with a large customer makes to the bank's bottom line.

Internal transfer pricing systems. Internal transfer pricing refers to the cost of funds as they are moved from one business unit to another. A sophisticated internal transfer pricing system will also cover the allocation of overhead costs to business units and will include transfer prices for internal services such as accounting or legal services. Internal transfer prices could, in principle, reflect the respective market prices, including maturities, and the repricing characteristics of the corresponding assets and liabilities. In practice, most banks choose a weighted average based on their specific funding mix.

Branch relationships provide a good example of internal transfer pricing. When making a loan that it cannot fund itself, a business unit will "borrow" funds from the treasury; the same unit will "lend" money to the treasury when it collects excess deposits. Internal transfer prices in both directions should be based on the same principles but with applicable modifications. For example, the transfer price of deposits may be modified for the cost of obligatory reserves. For consistent application of such a system, a bank must also have a supporting management accounting system.

Incorporating risk into the performance measurement framework. Risk can be incorporated into this framework in multiple ways. For the lending function, as an example, the internal cost of funds could reflect the credit risk of the loan being funded, with a higher transfer price being allocated to lower-quality loans. Loans with higher risk could be expected to generate higher returns.

Most banks apply a uniform transfer price for all loans, and the risk element is accommodated by requiring higher returns on lower-quality loans or requesting higher collateral to reduce the credit risk.

Another step is to determine how much capital should be assigned to each of the different business or product lines. The key issue is not how to determine the right amount of capital to be assigned for each business unit but how to assign capital to all businesses consistently and based on the same principles. In practice, it is often unnecessary to measure risk using sophisticated modeling techniques for all bank business lines and products to determine the appropriate coefficients. And in any case, it is nearly impossible to do it in a practical, consistent, and meaningful manner. Instead, banks typically use much simpler "return on risk capital" types of calculations. A practical approach followed by many banks is to use the weights provided under the Basel Accord (discussed in chapter 6) as a basis for calculations.

Transfer pricing should be carefully scrutinized when the analysis concerns a bank that belongs to a banking group or a holding company, especially if the group is domiciled abroad. In some cases, internal transfer prices have been set that allow the parent to take profits from a bank—for example, by charging more than the applicable market price for funds borrowed by the bank from other business units or members of the conglomerate, or by paying less than the market price for funds provided by the same bank. Such cases are especially frequent in countries where there are limits to or complications with dividend repatriation.

6

Capital Adequacy

KEY MESSAGES

- Capital is required as a buffer against unexpected losses.
- Capital cannot substitute for bad management or for inadequate risk management policies and practices.
- Capital consists of a strong base of permanent shareholders' equity and disclosed reserves, supplemented by other forms of qualifying capital (for example, additional Tier 1 capital, minority capital, and subordinated debt).
- International standards for minimum capital and for assessment and measurement of capital adequacy are set by the Basel Committee for Banking Supervision (currently, under the Third Basel Accord, or Basel III).
- Basel III set the minimum capital adequacy ratio at no lower than 8 percent (Tier 1 capital of 6 percent and Tier 2 capital of 2 percent).
- A capital conservation buffer is then added.
- When the banking sector or an individual bank's asset growth exceeds the underlying growth of the economy, a countercyclical buffer of up to 2.5 percent can be introduced by extending the capital conservation buffer requirement.
- The ratios must be seen as a minimum. In transitional or volatile environments, a risk-weighted capital adequacy requirement of substantially more than the minimum would be more appropriate. In many small or unstable financial markets, the minimum capital requirement set by the regulatory authorities should be significantly higher than the minimum set by Basel II and Basel III.
- The capital adequacy requirements are augmented through the introduction of a leverage ratio to ensure that a relationship is maintained between bank capital and total assets.

6.1 Introduction: Characteristics and Functions of Capital

Almost every aspect of banking is either directly or indirectly influenced by the availability and cost of capital. Capital is one of the key factors to be considered when the safety and soundness of a particular bank is assessed. An adequate capital base serves as a safety net for a variety of risks to which an institution is exposed in the course of its business. Capital absorbs possible losses and thus provides a basis for maintaining depositor confidence in a bank. Capital is a determinant of a bank's lending capacity. A bank's balance sheet cannot be expanded beyond the level determined by its capital adequacy ratio. Consequently, the availability of capital determines the maximum level of assets (on- and off-balance-sheet).

Capital, however, is not a substitute for bad management, poor risk management, poor corporate governance, or weak internal controls.

The cost and amount of capital affect a bank's competitive position. Shareholders expect a return on their equity, and the bank's obligation to earn a reasonable return influences the pricing of bank products. There is also another market perspective: to grant loans and advances, a bank must normally be able to attract deposits from the public. Doing so requires public confidence in the bank, which in turn can best be established and maintained by a capital buffer. If a bank faces a shortage of capital, or if the cost of capital is high, a bank stands to lose business to its competitors.

The key purposes of capital are to provide stability and to absorb losses, thereby providing a measure of protection to depositors and other creditors in the event of liquidation. Consequently, the capital of a bank should have three important characteristics:

- It must be permanent.
- It must not impose mandatory fixed charges against earnings.
- It must allow for legal subordination to the rights of depositors and maintain a creditor hierarchy.

The total amount of capital is fundamental to the bank's soundness. Also important is the nature of bank ownership, specifically the identity of those owners who can directly influence the bank's strategic direction and risk management policies. A bank's ownership structure must ensure the integrity of the bank's capital and be able to supply more capital, if and when needed. The ownership must not negatively influence the bank's capital position or expose

it to additional risk. In addition to owners who are less than "fit and proper" (see chapter 2) or who do not effectively discharge their fiduciary responsibilities, the structure of financial conglomerates may also negatively affect the capital of banks in such groups.

Banks inherently have a relatively low capital-to-assets ratio. To encourage prudent management of the risks associated with this balance sheet structure, regulatory authorities in most countries started to introduce certain capital adequacy requirements. In the late 1980s, the Basel Committee on Banking Supervision (BCBS) took the lead to develop a risk-based capital adequacy standard that would lead to international convergence of supervisory regulations governing the capital adequacy of internationally active banks. The dual objectives for the new framework were to strengthen the soundness and stability of the international banking system and, by ensuring a high degree of consistency in the framework's application, to diminish the sources of competitive inequality among international banks. This initiative resulted in the Basel Capital Accord, also known as Basel I (BCBS 1988). Emergence of new instruments with complex risk profiles—increasing volatility and internationalization trends—and the trend toward financial conglomerates have prompted ongoing changes to Basel I. Eventually, this led to the introduction of a new and more sophisticated framework, known as the Basel II Accord (BCBS 2004 and subsequent updates).

Basel II has undergone major changes since the 2007–08 financial sector crisis. In 2011, the BCBS issued *Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems*, with an effective date of January 1, 2013. In December 2017, it issued an update—with subsequent explanatory documents and refinements issued as late as early 2019. Banks internationally were largely expected to finalize the process of phasing in the revised Basel III requirements by January 1, 2019, although some of the latest changes are effective from 2022 only.

6.2 Capital Adequacy Standards and the Basel Accords

Basel I

When Basel I was issued in 1988, it defined regulatory capital, measures of risk exposure, and rules specifying the level of capital to be maintained in relation to these risks. It introduced a de facto capital adequacy standard—based on the risk-weighted composition of a bank's assets and off-balance-sheet exposures—that ensured that adequate capital and reserves would

be maintained to safeguard solvency. Although the original targets of Basel I were international banks, many national authorities promptly applied Basel I and introduced formal regulatory capital requirements. After the introduction of the risk-based capital adequacy standard, risk-based capital ratios have increased significantly in all countries that have adopted the standard.

Basel I has also played a major role in improving the safety of banking systems in lower-income countries and in transitional economies. Adopted and implemented in more than 100 countries, it now forms an integral part of any risk-based bank supervisory approach. Aware that the banking environments in some countries entail additional economic and market risks, many regulators have introduced even higher standards, with 12–15 percent often regarded as the appropriate capital adequacy ratio for transitional and low- to middle-income environments.

The world financial system has seen considerable changes since the introduction of Basel I. The volatility of financial markets has increased, and there has been a significant degree of financial innovation. There also have been incidents of economic turbulence leading to widespread financial crisis—for example, in Asia in 1997 and in Eastern Europe in 1998. The risks that internationally active banks must deal with have become more complex. Consequently, concern increased as to whether Basel I provided an effective means to ensure that capital requirements matched a bank's true risk profile; in other words, there was a growing belief that Basel I was *not* sufficiently risk sensitive. The risk measurement and control aspects of Basel I needed to be improved.

Basel II

In 1999, the BCBS started consultations that led to a new Capital Accord (Basel II) that was better attuned to the complexities of the modern financial world. Although the new framework aims to provide a more comprehensive approach to measuring banking risks, its fundamental objectives remained the same: to promote safety and soundness of the banking system and to enhance the competitive equality of banks. With an implementation date of 2008, much of the development of Basel II had been completed by 2006.

A significant aspect of Basel II was the greater use of the banks' internal systems as an input to the capital assessment and adequacy calculations. It provided incentives for banks to improve their risk management practices,

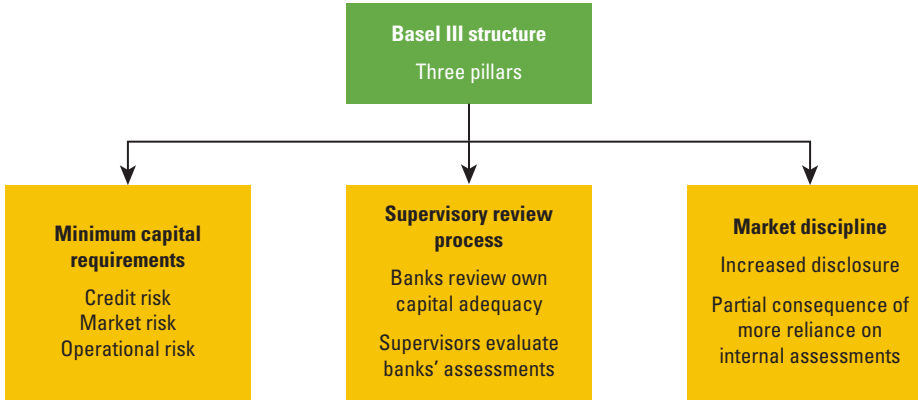
with increasingly sensitive risk weights when banks adopted more sophisticated approaches to risk management. It allowed greater national discretion on how specific rules may be applied, permitting countries to adapt the standards to different conditions in national financial markets.

Basel III

In response to the global financial crisis of 2007–08, the BCBS released Basel III in June 2011 to improve the level and quality of capital and to further enhance risk coverage (BCBS 2011). The effective date of the Accord was January 2013, but member countries were allowed a long transitional period—to end in January 2019 (although some changes are not effective until 2022). Countries with well-developed financial systems that actively participated in the development of Basel II promptly started the transition process to Basel III.

In addition to the minimum capital requirements (Pillar 1), both Basel II and Basel III include two additional pillars: an enhanced supervisory review process (Pillar 2) and effective use of market discipline (Pillar 3). All three pillars are mutually reinforcing, and no one pillar should be viewed as more important than another (figure 6.1).

Figure 6.1 Conceptual Framework for Assessment of Banks' Capital Adequacy and Risk Coverage under Basel III



Note: The Basel III Accord, issued by the Basel Committee on Banking Supervision, refers to *Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems* (BCBS 2011).

6.3 Basel III: Constituents of Capital and Minimum Capital Requirements

Basel III introduces several measures to strengthen the global capital framework (table 6.1):

- *The quality and quantity of capital are increased*, with a greater focus on *common equity*. Capital must be of the highest quality to better absorb losses from shocks that could emanate from anywhere.

Table 6.1 Overview of Qualifying Equity Instruments under Basel III

Capital adequacy	Limitations	Qualifying instruments: selected examples
Credit risk-weighted assets: on balance sheet		
Credit risk-weighted assets: off balance sheet		
Market risk-weighted assets		
Operational risk-weighted assets		
Qualifying capital to total risk-weighted assets	Minimum of 8 percent	
Total Tier 1 capital	Minimum of 6 percent	
Common equity	Minimum 4.5 percent	Common shares, retained earnings, disclosed reserves
Additional Tier 1 capital instruments	Limited to 1.5 percent	Share premiums on common shares, perpetual capital instruments, minority capital
Tier 2 capital	Maximum of 2 percent	
Additional Tier 1 instruments that exceed the 1.5 percent maximum		Perpetual capital instruments, minority capital
Other Tier 2 instruments		Subordinated term debt, general provisions, and loss reserves
Other		
Capital conservation buffer	2.5 percent made up of common equity	Common equity
Countercyclical capital instruments	Up to 2.5 percent based on specific bank circumstances	Common equity (an extension of the conservation buffer)
Leverage ratio	Tier 1 capital must be a minimum of 3 percent of total assets	Tier 1 capital to total assets may not exceed 3 percent

- *Risk coverage is improved* by strengthening counterparty credit exposure coverage and improving stress testing measures.
- *A simple leverage ratio is established* (Tier 1 capital must be at least 3 percent of total assets) to act as a backstop to the risk-based measure. This measure is critical to underpinning the whole regime and will provide an easily understandable second look at the results produced by the risk-based framework.
- *Capital conservation buffers and forward-looking provisions are introduced* to be used in periods of stress (see chapter 7, "Credit Risk Management").
- *Procyclicality is effectively reduced*.

In addition, Basel III introduces global liquidity standards (as covered in chapter 8, "Liquidity Risk Management"). As table 6.1 notes, overall qualifying capital to total risk-weighted assets must be a minimum of 8 percent.

Tier 1 Capital

Tier 1 capital must comprise a minimum of 6 percent of risk-weighted assets, of which 4.5 percent must be "core equity" (common equity) capital. Tier 1 capital must comprise predominantly common shares, retained earnings, and disclosed reserves. The criteria for classification of common equity shares for regulatory capital purposes are as follows:

- They represent the most subordinated claim in liquidation of the bank.
- Such shares are entitled to a claim on the residual assets that is proportional to its share of issued capital after all senior claims have been repaid in liquidation (that is, an unlimited and variable claim, not a fixed or capped claim).
- The principal is perpetual and never repaid outside of liquidation (setting aside discretionary repurchases or other means of effectively reducing capital in a discretionary manner allowable under relevant law).
- The bank does nothing to create an expectation at issuance that the instrument will be bought back, redeemed, or canceled, nor do the statutory or contractual terms provide any feature that might give rise to such an expectation.
- Distributions are paid out of distributable items (retained earnings included). The level of distributions is not in any way tied or linked to the amount paid in at issuance and is not subject to a contractual cap (except to the extent that a bank cannot pay distributions that exceed the level of distributable items).
- There are no circumstances under which the distributions are obligatory. Nonpayment is therefore not an event of default.

- Distributions are paid only after all legal and contractual obligations have been met and payments on more-senior capital instruments have been made. This means that there are no preferential distributions, including in respect of other elements classified as the highest-quality issued capital.
- It is the issued capital that takes the first and proportionately greatest share of any losses as they occur. Within the highest-quality capital, each instrument absorbs losses on a going concern basis proportionately and pari passu with all the others.
- The paid-in amount is recognized as equity capital (that is, not recognized as a liability) for determining balance sheet insolvency.
- The paid-in amount is classified as equity under the relevant accounting standards.
- Capital is directly issued and paid in, and the bank cannot directly or indirectly have funded the purchase of the instrument.
- The paid-in amount is neither secured nor covered by a guarantee of the issuer or related entity, nor is it subject to any other arrangement that legally or economically enhances the seniority of the claim.
- The capital is only issued with the approval of the owners of the issuing bank, either given directly by the owners or, if permitted by applicable law, by the board of directors or other persons duly authorized by the owners.
- The capital is clearly and separately disclosed on the bank's balance sheet.

Additional Tier 1 Capital

Tier 1 capital can be supplemented by perpetual capital instruments and minority capital, up to a maximum of 1.5 percent of risk-weighted assets. When such instruments exceed the 1.5 percent threshold, they will qualify as Tier 2 capital. The criteria for classification as additional Tier 1 capital for regulatory purposes are that the capital is as follows:

- Issued and paid in
- Subordinated to depositors, general creditors, and subordinated debt of the bank
- Neither secured nor covered by a guarantee of the issuer or related entity or other arrangement that legally or economically enhances the seniority of the claim vis-à-vis bank creditors
- Perpetual, that is, there is no maturity date and there are no step-ups or other incentives to redeem.

Tier 2 Capital

Tier 2 capital—comprising subordinated term debt, general provisions, and loss reserves—may constitute up to 2 percent of the minimum 8 percent capital requirement.

A question sometimes asked is whether a bank is required to have Tier 2 capital. The answer is "no." The entire capital base of a bank can be made up of core equity instruments.

The criteria for classification as Tier 2 capital (including debt instruments) for regulatory purposes are as follows:

- The capital is issued and paid in.
- The capital is subordinated to depositors and general creditors of the bank.
- The capital is neither secured nor covered by a guarantee of the issuer or related entity or other arrangement that legally or economically enhances the seniority of the claim in relation to depositors and general bank creditors.
- The capital is issued for a minimum original maturity of at least five years.
- Recognition in regulatory capital in the remaining five years before maturity will be amortized on a straight line basis.
- There are no step-ups or other incentives to redeem.
- Capital may be callable at the initiative of the issuer only after a minimum of five years.
- To exercise a call option, a bank must receive prior supervisory approval.
- A bank must not do anything that creates an expectation that the call will be exercised and will not exercise a call unless (a) the bank replaces the called instrument with capital of the same or better quality, and the replacement of this capital is done under conditions that are sustainable for the income capacity of the bank; or (b) the bank demonstrates that its capital position is well above the minimum capital requirements after the call option is exercised.
- The investor must have no rights to accelerate the repayment of future scheduled payments (coupon or principal) except in bankruptcy and liquidation.
- The instrument cannot have a credit-sensitive dividend feature (that is, a dividend or coupon that is reset periodically based in whole or in part on the banking organization's credit standing).
- Neither the bank nor a related party over which the bank exercises control or significant influence can have purchased the instrument, nor can the bank directly or indirectly have funded the purchase of the instrument.

- If the instrument is not issued out of an operating entity or the holding company in the consolidated group (for example, a special purpose vehicle [SPV]), proceeds must be immediately available without limitation to an operating entity or the holding company in the consolidated group.

Capital Conservation Buffer

Basel III requires a capital conservation buffer of 2.5 percent (BCBS 2011, paragraphs 122–35). The conservation buffer (to "withstand future periods of stress") provides a strong incentive for banks to build up capital in good times, which can then be drawn down as losses are incurred.

Retaining a greater proportion of earnings during a downturn will help ensure that capital remains available to support the ongoing business operations of banks through the period of stress. In this way, the framework should help reduce procyclicality.

The lower the levels of common equity Tier 1 and other fully loss-absorbing capital, the higher the amount of earnings that cannot be distributed. This principle applies to both the conservation buffer and the countercyclical buffer discussed later. Distribution may be as follows:

- *At less than 5.75 percent:* 100 percent of earnings must be retained.
- *At less than 7.00 percent:* 80 percent of earnings must be retained.
- *At less than 8.25 percent:* 60 percent of earnings must be retained.
- *At less than 9.50 percent:* 40 percent of earnings must be retained.
- *At more than 9.50 percent:* all earnings may be distributed.

When buffers have been drawn down, one way banks should look to rebuild them is by reducing discretionary distributions of earnings such as dividend payments, share buybacks, and staff bonus payments. Banks may also choose to raise new capital from the private sector as an alternative to conserving internally generated capital. These options should be discussed with supervisors as part of the capital planning process.

It is not acceptable for banks that have depleted their capital buffers to use future predictions of recovery as justification for maintaining generous distributions to shareholders, other capital providers, and employees. These stakeholders, rather than depositors, must bear the risk that recovery will not be forthcoming.

Nor is it acceptable for such banks to try to use the distribution of capital as a way to signal their financial strength. Not only is this considered by Basel III to be irresponsible from the perspective of an individual bank

(putting shareholders' interests above depositors'), it may also encourage other banks to follow suit.

Countercyclical Measures: An Extension of the Capital Conservation Buffer

Losses incurred in the banking sector can be extremely large when a downturn is preceded by a period of excess credit growth (BCBS 2011, paragraphs 136–50). These losses can destabilize the banking sector and spark a vicious circle whereby problems in the financial system can contribute to a downturn in the real economy that then feeds back to the banking sector. These interactions highlight the particular importance of the banking sector building up additional capital defenses in periods when the risks of systemwide stress are growing markedly.

The countercyclical buffer requirement is implemented through an extension of the capital conservation buffer. The countercyclical buffer aims to ensure that banking sector capital requirements take account of the macrofinancial environment in which banks operate. It will be deployed by national jurisdictions when excess aggregate credit growth is judged to be associated with a buildup of systemwide risk, to ensure the banking system has a buffer of capital to protect it against future potential losses. This focus on excess aggregate credit growth means that jurisdictions will likely only need to deploy the buffer infrequently.

The buffer for internationally active banks will be a weighted average of the buffers deployed across all the jurisdictions to which it has credit exposures. This means that they will likely find themselves subject to a small buffer on a more frequent basis, because credit cycles are not always highly correlated across jurisdictions. The countercyclical buffer may vary between 0 percent and 2.5 percent.

The countercyclical buffer regime consists of the following elements:

- National authorities will monitor credit growth and other indicators that may signal a buildup of systemwide risk and assess whether credit growth is excessive and is leading to the buildup of systemwide risk. Based on this assessment, they will put in place a countercyclical buffer requirement when circumstances warrant. This requirement will be released when systemwide risk crystallizes or dissipates.
- Internationally active banks will look at the geographic location of their private sector credit exposures and calculate their bank-specific countercyclical capital buffer requirement as a weighted average of the requirements being applied in jurisdictions to which they have credit exposures.

- The countercyclical buffer requirement to which a bank is subject will extend the size of the capital conservation buffer. Banks will be subject to restrictions on distributions if they do not meet the requirement.

To give banks time to adjust to a buffer level, a jurisdiction will preannounce its decision to raise the level of the countercyclical buffer by up to 12 months before the increase is implemented. Decisions by a jurisdiction to decrease the level of the countercyclical buffer will take effect immediately. The preannounced buffer decisions and the actual buffers in place for all Basel Committee member jurisdictions will be published on the Bank for International Settlements (BIS) website (https://www.bis.org).

6.4 Pillar 1: Risk-Based Regulatory Capital Allocation

The capital adequacy standard under the Basel Accords is based on the principle that the level of a bank's capital should be related to the bank's specific risk profile. The capital adequacy requirement was the essence of Basel I, and it constituted Pillar 1 under Basel II. Measurement of the capital adequacy requirement is now determined by four risk components—*credit risk*, *counterparty credit risk*, *market risk*, and *operational risk*—as well as market disclosure. For each of the risk components, more than one model could be used. Basel III is reducing the model options again (table 6.2). In principle, the models included some forms of a standardized approach as well as an approach based on the bank's internal modeling systems.

Credit Risk

The central focus of the Basel Accords' capital adequacy framework is the assessment of credit risk, including aspects of country risk and counterparty risk. This is because banks normally carry the highest exposures to credit risk. A bank's credit risk profile is determined by assigning various risk weights to its assets and off-balance-sheet commitments. Basel I introduced a fairly simple standard methodology with risk weights based on probability of losses for different classes of assets on a bank's balance sheet. The off-balance-sheet exposures are included using multiplication factors, again related to the expected probability of losses for the respective class of instruments. The risk weighting of assets and off-balance-sheet positions has provided a major step toward improved objectivity in assessing the adequacy of bank capital. The simplicity of this methodology has also enabled it to be introduced in banking systems that are in their early stages of development.

Table 6.2 Summary of the Basel III Accord for Full Implementation by 2022

	Pillar 1								Pillar 2	Pillar 3
	Capital adequacy requirement and basis								Supervisory review	Market discipline
	Credit risk				Market risk			Operational risk	Regulators must ensure that banks have sound internal processes for capital assessment based on risk commensurate with risk profile.	Enhanced disclosure to facilitate investor decision making. More detail required for banks that use advanced risk management approaches.
	Standardized approach	Internal ratings-based approaches		Standardized approach counterparty credit risk (SA-CCR)	Standardized approach	Internal model		Standardized approach		
Detail		Foundation Approach (F-IRB)	Advanced Approach (A-IRB)	Counterparty Credit Risk and Credit Valuation Adjustment (CVA)	Building block Approach	Value at Risk (VAR): stressed To be replaced by ES in 2023	Expected Shortfall Measure (ES)	Business indicator for three different business lines		
	1	2	3	4	5	6	7	8	9	10
–	Places more emphasis on banks' own internal control and management, the supervisory review process, and market discipline.									
1	Similar to Basel I, but more reliance on rating agencies.									
2	Divide loan portfolio into seven buckets. Probability of default (PD) is provided by bank, with the exposure at default (EAD) and loss given default (LGD) provided by the regulator.									
3	Divide loan portfolio into seven buckets. Probability of default (PD), exposure at default (EAD), and loss given default (LGD) all provided by the bank, using historical experience.									
4	Basel III has introduced a new standardized approach (SA-CCR), which determines EAD using both replacement cost (RC) and potential future exposure (PFE) multiplied by a preset alpha (α) factor; α has been set at 1.4.									
5	Capital requirement calculated separately for market risks. Trading book used for interest, equities, currency, and commodities risks, with latter two using the banking book as well.									
6	Market risk capital is currently (2019) based on the higher of VAR over the past 60 days, or the previous day's VAR (stressed). This measure is being refined through an expected shortfall measure that places increased focus on extreme tail loss events.									
7	Expected shortfall measures the average of the worst 2.5 percent of losses. Whereas VAR calculates the losses at a single cutoff point in the distribution (for example, 97.5 percent), ES looks at the average of any loss that exceeds the cutoff point in the distribution. Therefore, if the same cutoff point is used for VAR and for ES, the value of ES will be higher than the value of VAR. The difference between ES and VAR outcomes increases in cases of fat-tailed distributions. In the revised market risk framework, the 97.5th percentile ES is roughly equivalent to the 99th percentile VAR used in Basel 2.5.									
8	Basel III returns to a greatly simplified version, similar to the original standardized approach. Business indicators (BI) are established for three business lines. Size of income influences the derived business indicator component (BIC). BIC is multiplied by an internal loss multiplier to calculate operational risk capital.									
9	Regulator must ensure that banks have sound internal processes for risk-based capital assessment commensurate with risk profile.									
10	Enhanced disclosure (quantitative and qualitative) based on materiality, to provide markets with information necessary to make investment decisions.									

However, such simple weighting of assets provided only a crude measure of economic risk, primarily because the methodology is not effectively calibrated to account for different default risks. Consequently, Basel II and III provided a broader, better calibrated range of options for credit risk assessment to allow banks and supervisors to select approaches that are most appropriate for their operations and their financial market infrastructure. This approach also allowed a certain degree of national discretion in the way each of the options may be applied in national markets (although this also means continued efforts to ensure the needed consistency in application). The revised framework includes a more complex version of a standardized approach and two versions of an internal ratings-based model (figure 6.2).

Standardized Approach for Credit Risk

Most banks around the world use the *standardized approach* (SA) for credit risk. Under this approach, supervisors set the risk weights that banks apply to their exposures to determine risk-weighted assets. This means that banks *do not use* their internal models to calculate risk-weighted assets.

Eligibility criteria for acceptability of credit assessments made by external credit assessment institutions (or rating agencies) include objectivity, independence, transparency, credibility, international recognition, and access to the resources needed to establish and then regularly update the individual ratings. The national supervisors are responsible for determining whether an external credit assessment institution credibly meets the eligibility criteria. Nonetheless, certain reservations about the use of such assessments remain because of the agencies' mixed record when rating less-than-prime borrowers as well as the agencies' use of different credit analysis methodologies. In addition, in many low- or middle-income countries, there are no rating agencies or the agencies lack adequate capacity. (An associated issue is the inadequacy of accounting and financial reporting standards, for both banks and their clients.)

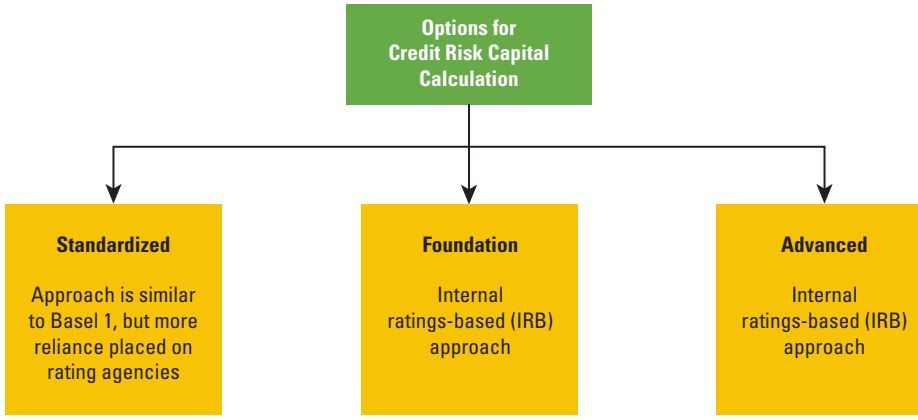
The SA allows banks to use credit risk mitigation techniques (such as collateral, netting, and guarantees) to manage (that is, reduce) their exposures and risk weights.

Basel III enhances the SA regulatory framework by

- Improving its granularity and risk sensitivity;
- Reducing mechanistic reliance on credit ratings by requiring banks to conduct sufficient due diligence and by developing a refined, non-ratings-based approach for jurisdictions that cannot or do not wish to rely on external credit ratings;

- Providing the foundation for a revised output floor to internally modeled capital requirements (to replace the existing Basel I floor) and related disclosure to enhance comparability across banks and restore a level playing field;
- Developing a more granular lookup table for exposures to corporates;
- Applying specific risk weight to exposures to small and medium enterprises (SMEs);
- Including a stand-alone treatment for exposures to project finance, object finance, and commodities finance;
- Developing more risk-sensitive approaches for residential real estate exposures—whereby risk weights vary based on the loan-to-value (LTV) ratio of the mortgage (instead of the existing single risk weight)—in ways that better reflect differences in market structures;
- Distinguishing between different types of retail exposures, such as when the regulatory retail portfolio distinguishes between revolving facilities (where credit is typically drawn upon) and transactors (where the facility is used to facilitate transactions rather than a source of credit); and
- Making the credit conversion factors (CCFs), which are used to determine the amount of an off-balance-sheet exposure to be risk weighted—including the introduction of positive CCFs for unconditionally cancellable commitments (UCCs)—more risk sensitive.

Figure 6.2 Basel III Menu of Credit Risk Approaches



Under the SA, off-balance-sheet items are to be converted into credit exposure equivalents using the conversion factors, which are similar to those established under Basel I and II. With derivative instruments, banks are exposed to credit risk not for the full face value of their contracts but only to the potential cost of restoring the cash flows if the counterparty defaults. The theoretical basis for assessing the risk on all derivative instruments is the same, with the "credit equivalent" amounts being dependent on the maturity of the respective contract and on the volatility of the rates and prices underlying this type of instrument. For capital adequacy assessment, the derivative instruments are converted according to the same principles as the other types of off-balance-sheet exposures.

Internal Ratings-Based Approaches

The internal ratings-based (IRB) approach for credit risk allows banks, under certain conditions, to use their internal models to estimate credit risk and therefore risk-weighted assets.

Conceptually, the IRB approach is based on *asset classes* whereby banks must categorize exposures into broad asset classes with different risk characteristics. The asset classes include corporate, sovereign, bank, retail, and equity. For each asset class, there are unexpected losses and expected losses. Basel II provides specific rules for the capital treatment of expected losses (covered by general loss reserves). The IRB models focus on the risk-weight functions for the unexpected losses.

The risk measures include probability of default (PD), loss given default (LGD), and the exposure at default (EAD). The PD of a borrower or group of borrowers is the central measurable concept on which the IRB approach is founded. Banks' internal measures of credit risk are normally based on assessments of the risk characteristics of both the borrower and the specific type of transaction. In addition, a bank must estimate exactly how much it is likely to lose should a borrower default on an obligation. The magnitude of *likely* loss is the LGD and is normally expressed as a percentage of a bank's exposure. The *actual* loss is contingent upon the amount at the time of default, commonly expressed as EAD.

These components (PD, LGD, and EAD) form the basic inputs to the IRB approach. They combine to provide a measure of the expected intrinsic, or economic, loss. Consequently, they form a basis for credit risk-related capital adequacy requirements.

There is a common misconception that using one of the IRB approaches to measure credit risk would reduce capital charges. This is not necessarily true: the IRB measurements will normally be more accurate, and the risk-weight curve far steeper, than for the standardized approach. As a consequence, a poor-quality loan portfolio will produce a higher capital requirement when using an IRB approach. It is also worth noting that using an IRB methodology will result in increased volatility in the capital requirement.

For each of the asset classes covered under the IRB framework, there are two options:

- *Foundation IRB (F-IRB),* where a bank provides its own estimates for the PD and uses the EAD and LGD provided by the supervisory authority. Once the total probable loss (given the various probabilities of default) is calculated, a capital charge is determined based on a risk weight for each of the asset (sub)classes.
- *Advanced IRB (A-IRB),* where a bank provides its own estimates of PD, EAD, and LGD figures and its own calculation of effective maturity, based on historical experience. This alternative opens the door to credit risk modeling and introduces the concept of correlation, which—although not yet accepted by regulatory authorities and not permitted by the Capital Accord—is common practice among the more sophisticated banks.

The 2017 Basel III reforms introduced some constraints to banks' estimates of risk parameters. The main changes to the IRB approach for credit risk will do the following:

- Remove the option to use the A-IRB approach for exposures to financial institutions and large corporates;
- Disallow the IRB approach for equity exposures; and
- Apply (where the IRB approach is retained) minimum levels on the probability of default and for other inputs.

In practice, implementation of any of the IRB approaches includes the following elements (BCBS 2017b):

- *Classification of exposures* by broad asset classes (for example, sovereign, corporate, and retail)
- *Risk estimates that the bank must assign* (using the standardized foundation approach or its own internal estimates) for each asset (sub)class or credit risk exposure

- *Risk-weight functions* to derive the respective capital requirements for each exposure type
- *A set of minimum requirements* established by the supervisory authorities that a bank must meet to be eligible to use an IRB approach—the minimum requirements being related to methods, processes, controls, data collection, and information technology (IT) systems that support the assessment of credit risk, the assignment of internal risk ratings, and the quantification of default and loss estimates
- *Supervisory review* of a bank's compliance with the minimum requirements, across all asset classes. In principle, the bank may choose one IRB approach for some asset classes and another for other asset classes. Once a bank adopts the IRB approach, it is expected to continue to employ the IRB approach indefinitely.

To be eligible to use the IRB approach, a bank is required to demonstrate to its supervisor that it meets certain minimum requirements, at the outset and on an ongoing basis. The overarching principle for eligibility is that the rating and risk estimation systems and processes to be used by the bank provide for a meaningful assessment of borrower and transaction characteristics, a meaningful differentiation of risk, and reasonably accurate and consistent quantitative estimates of risks that could be easily understood and verified by third parties (for example, supervisors or external auditors). Basel II detailed requirements for rating system design and operations, for risk quantification and validation of internal estimates, and for the related corporate governance and oversight.

Counterparty Credit Risk

The Financial Stability Institute, in a September 2018 document ("Counterparty Credit Risk in Basel III: Executive Summary"), describes Basel III's risk-based capital charges for counterparty credit risk (CCR) as covering two important characteristics of CCR: the risk of counterparty default and a credit valuation adjustment (CVA). The risk of counterparty default was already covered in Basel I and Basel II.

The Basel III reforms, therefore, introduce a new capital charge for the risk of loss due to the deterioration in the creditworthiness of the counterparty to a derivatives transaction or a securities financing transaction (SFT).

This potential mark-to-market loss is known as CVA risk. It captures changes in counterparty credit spreads and other market risk factors. CVA risk is defined as the risk of losses arising from changing CVA values in response to changes in counterparty credit spreads and market risk factors that drive prices of derivative transactions and SFTs. CVA risk was a major source of unexpected losses for banks during the 2007–08 financial crisis.

Material to the calculation of capital charges for default risk and CVA risk is the measurement of the exposure of the underlying transactions in a portfolio, where the concept of a netting set plays an important role. A netting set, for the estimation of the exposure amount, is a group of transactions with a single counterparty that are subject to a legally enforceable bilateral netting arrangement.

Under Basel III, banks must determine their capital requirements for CCR using stressed inputs. This addresses concerns that capital charges become too low during periods of compressed market volatility and also helps address procyclicality. The approach, like what has been introduced for market risk, will also promote more integrated management of market and counterparty credit risk.

Banks will be subject to a capital charge for potential mark-to-market losses—namely, a CVA associated with a deterioration in the creditworthiness of a counterparty. Although the Basel II standard covered the risk of a counterparty default (CCR), it did not address such CVA risk, which during the financial crisis was a greater source of losses than those arising from outright defaults.

In December 2017, the BCBS revised the CVA framework to achieve the following:

- *Enhance its risk sensitivity.* The current CVA framework did not cover an important driver of risk, namely, the exposure component of CVA. This component was directly related to the price of the transactions that were within the scope of application of the CVA risk capital charge. Because these prices were sensitive to variability in underlying market risk factors, the CVA also materially depended on those factors. The revised CVA framework considers the exposure component of CVA risk along with its associated hedges;
- *Strengthen its robustness.* CVA is a complex risk—often more complex than most of the positions in banks' trading books. Accordingly, the BCBS was of the view that such a risk could not be modeled by banks in a robust

and prudent manner. The revised framework removed the use of an internally modeled approach and consists of

- A standardized approach, with eligibility criteria including the ability to model and quantify CVA and CVA sensitivities to specified market risk factors and exposures at least monthly.
- A "basic" approach. (In addition, a bank with an aggregate notional amount of noncentrally cleared derivatives less than or equal to €100 billion may calculate its CVA capital charge as a simple multiplier of its CCR charge.)

- *Improve its consistency.* CVA risk is a form of market risk because it is realized through a change in the mark-to-market value of a bank's exposures to its derivative counterparties.

The standardized and basic approaches of the revised CVA framework have been designed and calibrated to be consistent with the approaches used in the revised market risk framework. In particular, the standardized CVA approach, like the market risk approaches, is based on fair value sensitivities to market risk factors, and the basic approach is benchmarked to the standardized approach.

Tables 6.3 and 6.4 provide examples of CVA and CCR disclosure from two of the world's major banks.

Table 6.3 Disclosure of Credit Valuation Adjustment

CCR2 – CVA capital charge				
		4Q18		2Q18
	EAD post-CRM	RWA	EAD post-CRM	RWA
Swiss francs, millions				
Total portfolios subject to the advanced CVA capital charge	31,650	5,669	32,332	5,174
of which VAR component (including the 3 x multiplier)	–	1,952	–	1,592
of which stressed VAR component (including the 3 x multiplier)	–	3,717	–	3,582
All portfolios subject to the standardized CVA capital charge	73	74	68	65
Total subject to the CVA capital charge	31,723	5,743	32,400	5,239

Source: Credit Suisse, Pillar 3 disclosure, Quarter 4, 2018.

Note: CCR2 = counterparty credit risk; CRM = credit risk management; CVA = credit valuation adjustment; EAD = exposure at default; RWA = risk-weighted asset; VAR = value at risk.

Table 6.4 Disclosure of Counterparty Credit Risk (CCR) Exposures, 2017

a. Total counterparty credit RWA

(Dollars in millions)

	Basel 3 Advanced RWA
OTC derivatives	$38,603
Repo-style transactions	11,305
Margin loans	11,509
Cleared transactions	6,954
Unsettled transactions	416
Total	**$68,787**

b. Counterparty credit exposures by PD range

(Dollars in millions)

			Exposure-Weighted Average		
	EAD	RWA	PD	LGD	Risk Weight
0.00 to < 0.15	$131,634	$25,841	0.08%	39.75%	19.63%
0.15 to < 0.50	42,713	18,593	0.30	41.45	43.53
0.50 to < 2.50	17,982	14,094	1.17	41.53	78.38
2.50 to < 10.00	1,126	1,640	4.17	44.39	145.65
10.00 to < 100.00	599	987	13.11	36.62	164.77
100.00 (default)	188	188	100.00	39.60	100.00
Eligible margin loans—300%	25	74	n/a	n/a	300.00
Total	**$194,267**	**$61,417**	**0.39%**	**40.30%**	**31.61%**

Source: Bank of America calculations for Pillar 3 disclosure, December 31, 2017.

Note: OTC = over-the-counter; EAD = exposure at default; RWA = risk-weighted assets; PD = probability of default; LGD = loss given default.

n/a = not applicable.

Market Risk

Market risk is defined as the risk of losses in on- and off-balance-sheet positions that arise from shifts in market prices. More specifically, market risk includes the general and specific interest rate and equity price risks for a bank's trading book of debt and equity instruments and related off-balance-sheet contracts as well as general foreign exchange and commodities risks throughout the bank (that is, in the trading and banking books). Trading book valuation methodologies typically include

- *Marking to market* by daily valuation of positions at readily available, independently sourced, closeout market prices;
- *Marking to model*, which is benchmarked and extrapolated from market inputs;

- *Independent price verification,* in which market prices are independently verified for accuracy (at least monthly) by outside experts; and
- *Valuation adjustments,* as needed.

For the calculation of the market-risk capital charge, banks are allowed to use either a *standardized approach* or an *internal model approach* (IMA). Both approaches result in the calculation of an actual capital charge, which is then converted into a notional risk weight, by using the percentage capital requirement set by the respective national regulatory authorities. Assets subject to market risk capital requirements are excluded from the credit risk-weighted capital requirements.

Banks are expected to manage their market risk in such a way that the capital requirements are being met on a continuous basis, including at the close of each business day, and to ensure that intraday exposures are not excessive. All transactions, including forward sales and purchases, shall be included in the calculation of capital requirements.

After the 2008 banking crises, the BCBS continued to evaluate market risk models and identified several weaknesses stemming from the use of the value at risk (VAR) metric as the basis of capital requirements:

- *Incentives for banks to take on tail risk.* Even with the introduction of the stressed VAR requirement, the design of the VAR and stressed VAR metrics fundamentally ignored losses that had less than a 1 percent probability of occurring. This created perverse incentives to hold positions that featured significant tail risks but were subject to limited risk in "normal" conditions.
- *Inability to capture the risk of market illiquidity.* The initial assumption was that a bank would be able to exit or hedge the trading book exposures over a 10-day period without affecting market prices. However, in times of stress, the market is likely to become illiquid rapidly when the banking system as a whole holds similar exposures. This happened at the height of the crisis as banks were unable to exit or hedge positions in a short time frame, resulting in substantial mark-to-market losses.
- *Inability to capture adequately the credit risk inherent in trading positions.* The VAR and stressed VAR metrics used so far did not adequately incorporate the credit risk to which trading book positions may be subject. The 10-day time horizon over which VAR and stressed VAR estimated

potential losses was too short to account for losses incurred in the event of default or a credit rating downgrade of the issuer of an instrument. The introduction of the incremental risk charge (IRC) model is expected to address this issue.

- *Liberal recognition of the risk-reducing effects of hedging and diversification*. The IMA had no constraint in recognizing hedging and diversification benefits across different asset classes (for example, equities and foreign exchange) based on estimates of correlations derived from precrisis historical data. However, the diversification effects that were based on historical data disappear in the crisis situation.
- *Inadequate risk sensitivity*. The SA needs to be better specified because it did not adequately address the risk sensitivity.

Fundamental Review of the Trading Book

In response to the shortcomings detailed above, the Fundamental Review of the Trading Book (FRTB) encompassed a comprehensive suite of market-risk capital rules developed by the BCBS as part of Basel III and intended to be applied to banks' wholesale trading activities.

Finalized in January 2016, *Minimum Capital Requirements for Market Risk* aimed to address the identified shortcomings in the existing Basel market risk framework (BCBS 2016). Originally, the revised framework was scheduled to be implemented as final rules under domestic legislation on January 1, 2019, with regulatory reporting under the framework becoming a requirement from December 31, 2019. However, on December 7, 2017, the BCBS's oversight body, the Group of Central Bank Governors and Heads of Supervision (GHOS), announced a delay in its implementation. The revised market risk framework will take effect as of January 1, 2022, and phased in over five years, concurrent with the implementation of the Basel III reforms endorsed by GHOS in December 2017. In the European Union, the FRTB will be implemented as part of the European Commission's revised capital requirements regulations published in November 2016.

Although the FRTB was not intended to increase banks' market-risk capital costs beyond those already imposed by the Basel framework, both the BCBS and industry analysts foresee that banks will experience significant increases in their cost of capital, in particular to support their trading activities.

Given the potential impacts for secondary bond market efficiency and liquidity, the final calibration and implementation of the FRTB are key priorities of capital market and banking regulators, bringing the following enhancements to the market risk framework (figure 6.3):

Figure 6.3 Key Features of the Revised BCBS Market Risk Framework

	Boundary between the banking book and trading book	Use and validation of banks' internal models	Risk measurement under the internal models approach	Risk measurement under the standardized approach
Current Basel 2.5 framework (amended in 2010)	Assignment to the trading book primarily relies on the bank's intent to trade an instrument *Issue: weak definition provides opportunity for banks to move instruments across the trading book/banking book boundary in pursuit of lower capital requirements*	Model approval/ removal determined on a bank-wide basis *Issue: model approval processes poorly positioned to deny/ remove approval for trading desks that are deemed inappropriate for model use*	Capital requirements primarily determined using value-at-risk (VAR) models *Issue: insufficient measurement of tail risks and liquidity risk of trading portfolios permits unrestrained diversification benefits*	Risk measurement based on an exposure-by-exposure building block approach *Issue: outdated calibration and insufficiently risk sensitive to serve as credible complement and fall-back to the internal models approach*
Standard (issued in 2016)	Robust boundary to clearly specify appropriate contents of the trading book and restrict arbitrary reassignment	Model approval/ removal determined at the trading-desk level; separate, more stringent capital requirements for risks not appropriate for modeling (nonmodelable risk factors or NMRFs)	Expected shortfall measure replacing VAR; separate NMRF capital requirement; fall back to the standardized approach for trading desks that fail model-approval assessments	Risk-sensitive measurement primarily based on the loss a bank could suffer (that is, sensitivities) under a defined stress scenario
Rivised standard (issued in 2019)	Further specification of regulatory book assignment requirements with better articulated precedence and clarification for certain exposures	New test metrics to discern poorly performing models; improved criteria for the identification of NMRFs	Adjustment to capital requirements to address different effects and calibration issues for trading desks and risks that fall short of processes to access modelability	Refined measurement method for FX risk, options and index instruments; recalibrated risk weights for general interest rate risk and FX risk

Source: BCBS 2019. ©Bank for International Settlements (BIS).

Note: BCBS = Basel Committee on Banking Supervision; FX = foreign exchange.

- *A revised standardized approach.* The revisions fundamentally overhaul the SA to make it sufficiently risk sensitive to serve as a credible fallback for, as well as a floor to, the IMA while still providing an appropriate standard for banks that do not require a sophisticated treatment for market risk.
- *A revised internal model approach.* The new approach introduces a more rigorous model approval process that enables supervisors to remove internal modeling permission for individual trading desks, enforce more consistent identification and capitalization of material risk factors across banks, and impose constraints on the capital-reducing effects of hedging and diversification.
- *A shift from a value at risk to an expected shortfall measure of risk under stress.* Use of ES will help to ensure a more prudent capture of "tail risk" and capital adequacy during periods of significant financial market stress.
- *Incorporation of the risk of market illiquidity.* Varying liquidity horizons are incorporated into the revised SA and IMA to mitigate the risk of a sudden and severe impairment of market liquidity across asset markets. These horizons replace the static 10-day horizon assumed for all traded instruments under VAR in the current framework.
- *A revised boundary between the trading book and banking book.* Establishment of a more objective boundary will reduce incentives to arbitrage between the regulatory banking and trading books while still being aligned with banks' risk management practices.

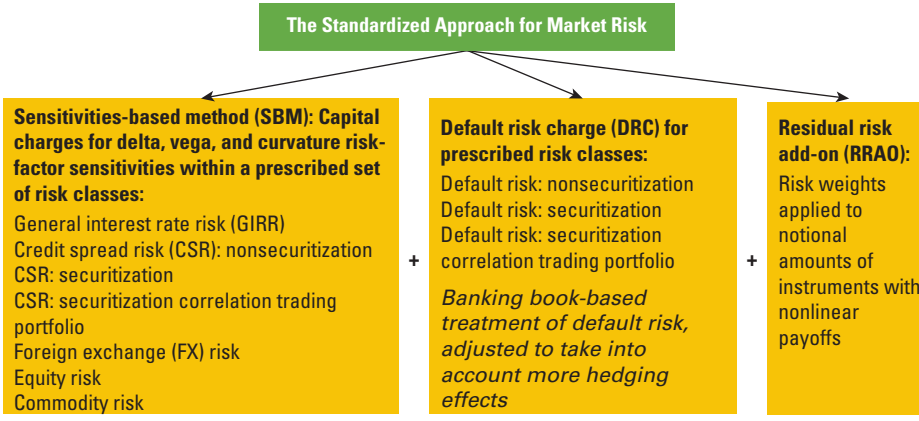
Standardized Approach for Market Risk Assessment

The standardized framework for market risk assessment is based on a building block approach. It encompasses the general market risk that arises from the bank's overall open position in four fundamental markets as well as the specific risk associated with the bank's individual securities positions. The capital requirement is calculated separately for the following risks:

- Interest risk in the bank's trading book
- Equities risk in the bank's trading book
- Currency risk in trading and banking books
- Commodities risk in trading and banking books.

The standardized approach (SA) comprises three main blocks, each covering specific types of risk that are relevant in the context of market risk management. A risk charge is computed for each of the three blocks, the sum of which is the overall risk charge for market risk under the SA. The SA components structure is summarized in figure 6.4.

Figure 6.4 Structure of the Standardized Approach in the Revised BCBS Market Risk Framework



Source: BCBS 2016, 7.

The three SA components include the following:

- *Sensitivities-based method (SBM),* based on the elements of the former standardized measurement method for market risk that used specified sensitivities within a risk class (such as the duration method for interest rate risk) and for certain instruments (such as the delta-plus method for options). The SBM provides a consistent, risk-sensitive framework that can be applied uniformly across a wide spectrum of banks in different jurisdictions.
- *Default risk charge (DRC),* which is calibrated to the credit risk treatment in the banking book, aiming to reduce the potential discrepancy in capital requirements for similar risk exposures across the banking book and trading books. As with the SBM, the DRC allows for some limited hedging recognition.
- *Residual risk add-on (RRAO),* which is expected to capture any other risks beyond the main risk factors already captured in the SBM and DRC components. It provides for a simple and conservative capital treatment for a number of complex trading book instruments, aiming to limit excessive risk-taking and regulatory arbitrage incentives.

Once quantified, the separate capital charges are added together and multiplied by the reciprocal of the regulatory percentage capital adequacy requirement to create a risk weight for the market risk.

Internal Model Approach: From VAR to Expected Shortfall

Until the recent changes, when using an internal model approach (IMA), the market risk capital charge was based on whichever was higher (see chapter 10, section 10.6): (a) the previous day's VAR; or (b) the average VAR over, for example, the last 60 business days.

The *expected shortfall* metric (also discussed in chapter 10, section 10.6) takes better account of tail risk—losses that banks can suffer in a stressed period. Using the average of the 10 worst loss events that exceeded an expected threshold, expected tail loss (ETL) tells management what they can expect to lose, once the 97.5 percent confidence level had been breached, on that given 2.5 out of 100 days (2.5 percent). The difference between ES and VAR outcomes increases in cases of fat-tailed distributions. In the revised market risk framework, the 97.5th percentile ES is roughly equivalent to the 99th percentile VAR used in Basel 2.5.

The use of an internal model for regulatory capital determination requires explicit approval of the bank's supervisory authority. For banks with trading activities in multiple jurisdictions, the supervisory authorities in both the home and host countries need to cooperate in the approval process. The IMA models are approved if the supervisory authority is satisfied that the bank's risk management system is conceptually sound and implemented with integrity and that the bank has adequate and skilled staffing covering trading, risk management, audit, IT, and back-office support.

A bank must meet the following criteria to get approval from its supervisory authorities to use the IMA:

- *Use of an independent risk management or control unit (RMU),* which is responsible for the design and implementation of the bank's risk management system. The unit should produce and analyze daily reports on the output of the bank's risk measurement models, including an evaluation of the relationship between measures of risk exposure and trading limits. This unit must be independent from business trading units and should report directly to the bank's senior management.
- *Regular backtesting and profit and loss attribution checks* by the RMU—that is, an ex post comparison of the risk exposure and profit and loss values generated by the model against actual daily changes in portfolio values over longer periods, as well as hypothetical changes based on static positions. Both of these exercises must be conducted at a trading desk level, while regular backtesting must also be conducted on the firmwide internal model for regulatory capital level determination.

- *Active involvement in the risk control process* by the board of directors and senior management. Daily reports prepared by the independent RMU must be reviewed by management of sufficient seniority to enforce both reductions of positions taken by individual traders and reductions in the bank's overall risk exposure.
- *A sophisticated program of stress testing* as a supplement to the risk analysis based on the bank's risk measurement model. The results of stress testing must be reviewed at least monthly by senior management, used in the internal assessment of capital adequacy, and reflected in the policies and limits set by management and the board of directors. Where stress tests reveal vulnerability, prompt steps must be taken to mitigate the risks (for example, by hedging against that outcome, reducing the size of the bank's exposures, or increasing capital).
- *Independent reviews* of the activities of the trading desks, risk control unit, and risk measurement system, which must be carried out regularly by the bank's own internal auditing process or an external auditor to assess any issues that might affect the bank's financial position.

Banks are expected to regularly conduct stress tests and have a proven track record of reasonable accuracy in measuring risk. A specialized unit must conduct the initial and ongoing validation of all internal models. Internal models must be validated at least annually to ensure that they are conceptually sound and adequately capture all material and market risks.

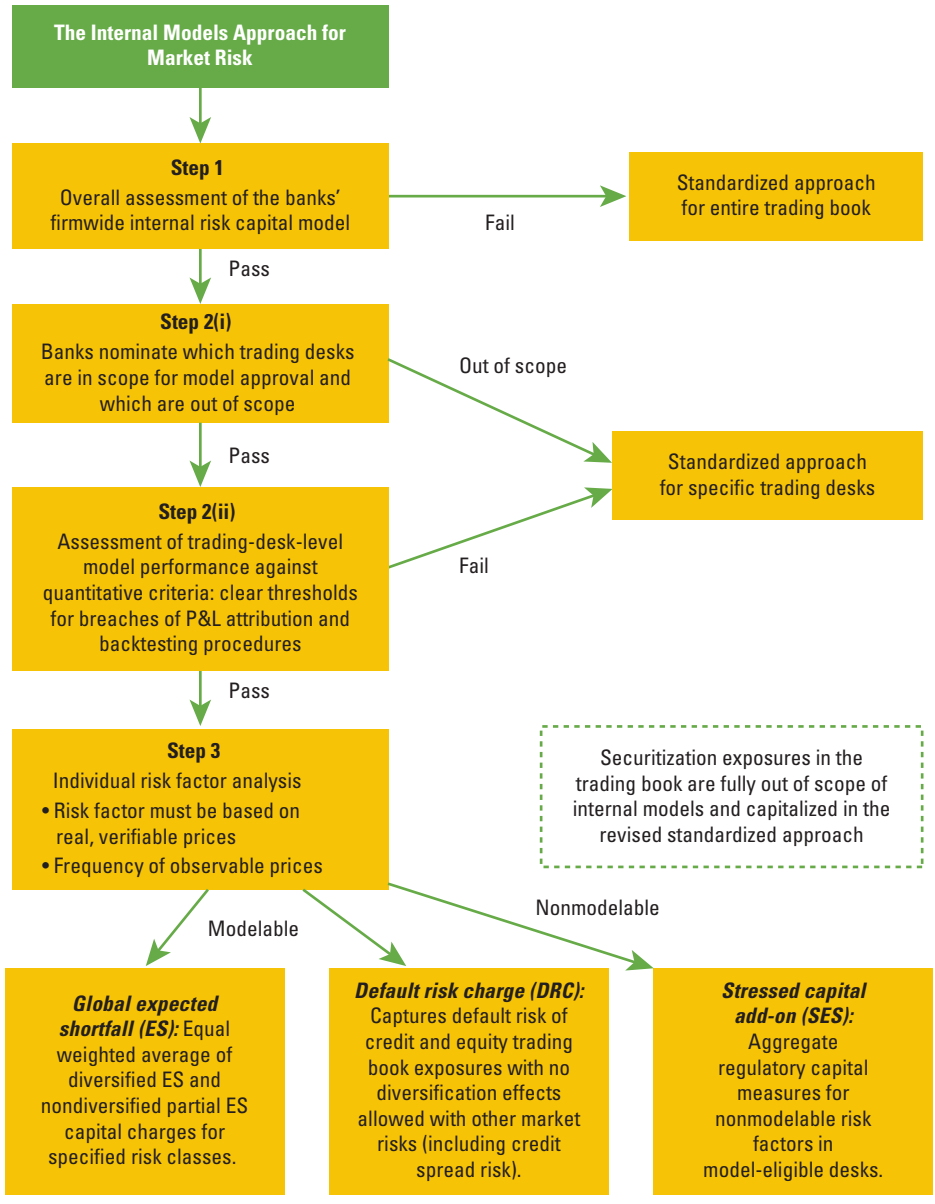
Models also require periodic reevaluation, particularly when there have been some structural changes in the market or changes to the composition of the bank's portfolio.

Banks have flexibility in designing their models, providing that they meet the minimum standards prescribed by their regulatory authorities for calculating a bank's capital charge. Banks may decide to apply stricter standards. In any case, the ES must be calibrated to a period of stress and computed daily for the bankwide internal model as well as for each trading desk included in the internal model. No particular type of ES model is prescribed.

Models must capture all the material risks run by the bank, as confirmed through profit and loss attribution and backtesting, and comply with detailed requirements specified in national risk management standards. Supervisors may permit banks to use models based on either historical simulation, Monte Carlo simulation, or other appropriate analytical methods (see chapter 10, section 10.6).

Figure 6.5 illustrates the IMA process and policy design. Table 6.5 provides an example of the IMA for market risk disclosure from one of the world's major banks.

Figure 6.5 Internal Model Approach (IMA) of the Revised BCBS Market Risk Framework



Source: BCBS 2016, 6.

Note: P&L = profit and loss; SA = standardized approach.

Table 6.5 Market Risk Disclosure

U.S. dollars, millions

Three months ended December 31, 2018 (in millions)	Risk-based capital	RWA
Internal models:		
Value-at-risk–based measure (VBM)	$ 784	$ 9,798
Stressed value-at-risk–based measure (SVBM)	2,212	27,654
Incremental risk charge (IRC)	430	5,374
Comprehensive risk measure (CRM)	72	904
Total internal models	**3,498**	**43,730**
Nonmodeled specific risk[a]	4,130	51,634
Other charges	849	10,612
Total market risk	**$8,477**	**$105,976**

Source: JPMorgan Chase 2018.

Note: RWA = risk-weighted assets.

(a) Nonmodeled specific risk includes trading book securitization RWA of $3.1 billion.

Operational Risk: Standardized Approach

Basel III includes capital charges explicitly related to operational risk, defined as "the risk of loss resulting from inadequate or failed internal processes, people, and systems or from external events" (BCBS 2017a). Banking statistics indicate a steady increase in operational risk because of the increasing use of highly automated technology, the increase in retail operations and growth of e-commerce, the increase in outsourcing, and the greater use of complex instruments and sophisticated techniques to reduce credit and market risk. This recognition has led to an increased emphasis on sound operational risk management by banks as well as the inclusion of operational risk in a bank's internal capital assessments and allocation process.

The financial crisis highlighted weaknesses in calculating capital requirements for operational risk, which were not enough to cover the losses incurred by some banks. And the sources of such losses—including those related to fines for misconduct or poor systems and controls—are also hard to predict using internal models.

The 2017 reforms incorporated in Basel III simplified the framework by replacing the four approaches of Basel II with a single SA. They also aimed to make the framework more risk sensitive by combining a refined measure of gross income with a bank's own internal loss history over 10 years. In theory,

this should make it easier to compare risk-weighted assets from bank to bank by removing the option to use multiple approaches and internal models. The new approach assumes that operational risk increases at an increasing rate with a bank's income and that banks that have experienced greater operational risk losses historically are more likely to experience such losses in the future.

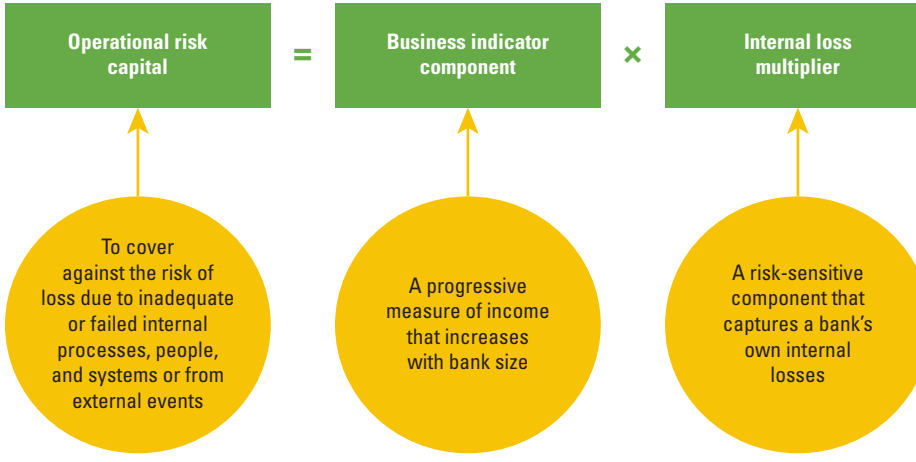
The new SA methodology is based on the following components (figure 6.6):

- *Business indicator,* a financial statement-based proxy for operational risk
- *Business indicator component,* which is calculated by multiplying the business indicator by a set of regulatory marginal coefficients according to the size of the incomes for that indicator (for less than €1 billion euros, a 0.12 coefficient; for less than €30 billion, a 0.15 coefficient; and for more than €30 billion, a 0.18 coefficient)
- *Internal loss multiplier,* a scaling factor based on a bank's average 10-year historical losses and the business indicator component.

The business indicator comprises three components:

- *Net interest, leases, and dividend component*
- *Services components:* net fee and commission income and net other operating income
- *Financial component:* net profit and loss on the trading and the banking books, respectively.

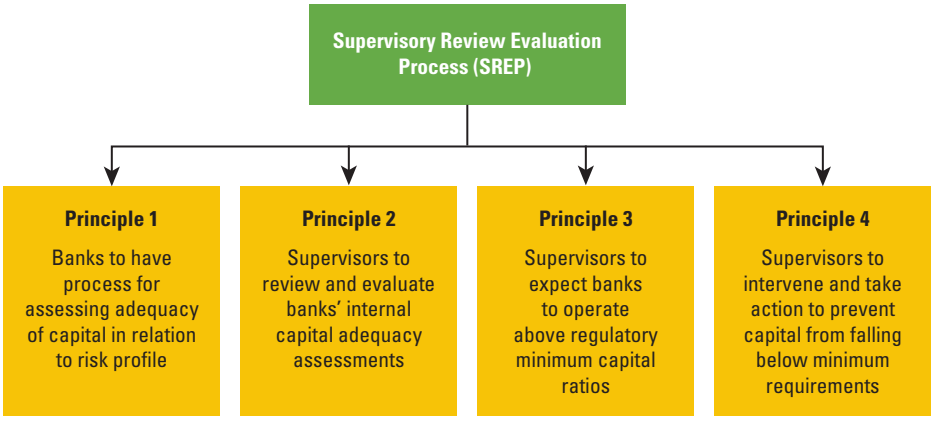
Figure 6.6 Operational Risk Capital Calculation



6.5 Pillar 2: Supervisory Review

Supervisory review is Pillar 2 of the Basel Accords and a critical part of the capital adequacy framework. It has two objectives: (a) to assess whether banks maintain adequate capital necessary for the risks inherent in their business profile and business environment; and (b) to encourage banks to have policies and internal processes for assessing and managing capital adequacy that are commensurate with their risk profile, operations, and business strategy. Figure 6.7 illustrates the key Pillar 2 components.

Figure 6.7 Principles of Basel Supervisory Review



Internal Capital Adequacy Assessment Process

Principle 1 of the supervisory review evaluation process (SREP) states that banks must have an internal capital adequacy assessment process (ICAAP)—that is, a procedure to ensure that the board of directors and management

- *Appropriately identify, measure, aggregate, and monitor the risks* incurred by the institution;
- *Possess the capital coverage determined by regulations and additional risks* that is sufficient for the fundamental risks the institution is exposed to; and
- *Have adequate risk management systems* in place that are continuously developed in accordance with the risk factors identified.

The role of supervisors is to review the bank's internal capital adequacy assessments and management processes to (a) ensure that the bank's capital targets and capital position are consistent with its overall risk profile and strategy, and (b) enable supervisory intervention if the bank's capital does not provide a sufficient buffer against risk. In an increasingly risky market environment, this is an increasingly sophisticated process.

An important aspect of supervisory reviews is the assessment of compliance with a bank's minimum standards and disclosure requirements using advanced capital management frameworks. Supervisors also are expected to have an approach for identifying and intervening in situations where falling capital levels raise questions about a bank's ability to withstand business shocks. Basel has established certain core principles for supervisory reviews. These principles, as well as the *Core Principles for Effective Banking Supervision* and other guidance notes related to the supervisory review process published by the BCBS, are discussed in more detail in chapter 17.

Supervisors are expected to take appropriate actions if they are not satisfied with the quality of a bank's internal processes and the results of a bank's own risk assessment and capital allocations. They are expected to have at their disposal the necessary enforcement powers and tools. For example, they should be able to require banks to hold capital in excess of the minimum, if so mandated by the risk characteristics of a particular bank or its business environment, and to require prompt remedial action if capital is not maintained or restored. The Basel framework sets special requirements for cooperation between supervisors, especially for the cross-border supervision of complex banking or financial groups.

ICAAP is key to any bank's risk and capital management processes as an integral part of the decision-making process. It provides for an ongoing assessment of a bank's overall risk profile and can be a useful tool for embedding a responsible risk culture across all levels in a bank. ICAAP affects the following:

- Strategy and risk appetite
- Risk assessment and management
- Forward-looking capital planning
- Budgeting and earnings volatility
- Stress and scenario analysis
- Capital targets and dividend decisions
- Disaster recovery planning.

Economic Capital

Increasingly, supervisors expect ICAAP to be based on economic capital—an internal model that assesses how much capital is required for various risks.

Economic capital can be described as the level of capital held that is commensurate with a bank's risk profile under severe stress conditions. This provides comfort to a range of stakeholders that the bank will be able to satisfy all its obligations to third parties with a desired degree of certainty and will continue to operate as a going concern.

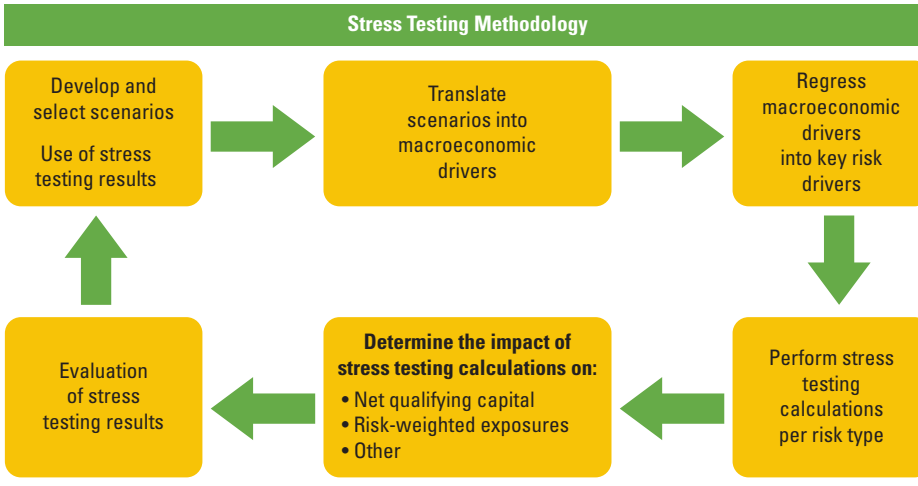
A key input into ICAAP is therefore an assessment of economic risk, with the outcome used to assess a bank's capital position, which should be the higher of economic and regulatory capital. Economic capital is also used in strategic capital planning, risk measurement, and portfolio management.

Stress Testing of Capital

The regulatory objectives of stress testing of capital relate to risk management, capital management and planning, and liquidity management and planning, as well as compliance. Business objectives, however, relate to planning (for growth), supply and demand of capital, and risk appetite as well as the setting of limits.

When planning for stress testing, the overriding principle must be realism. The objectives of the tests should be apparent and clear, comprehensive, actionable, accurate and reconciled to underlying data, and flexible. For the results to be realistic, management should be make a comprehensive assessment of risk, determine the sensitivity of risks to defined events or scenarios, and be able to assess the financial impact of events on earnings and capital (figure 6.8).

Figure 6.8 Key Elements of a Stress Testing Framework: Governance, Methodology, and Information Technology

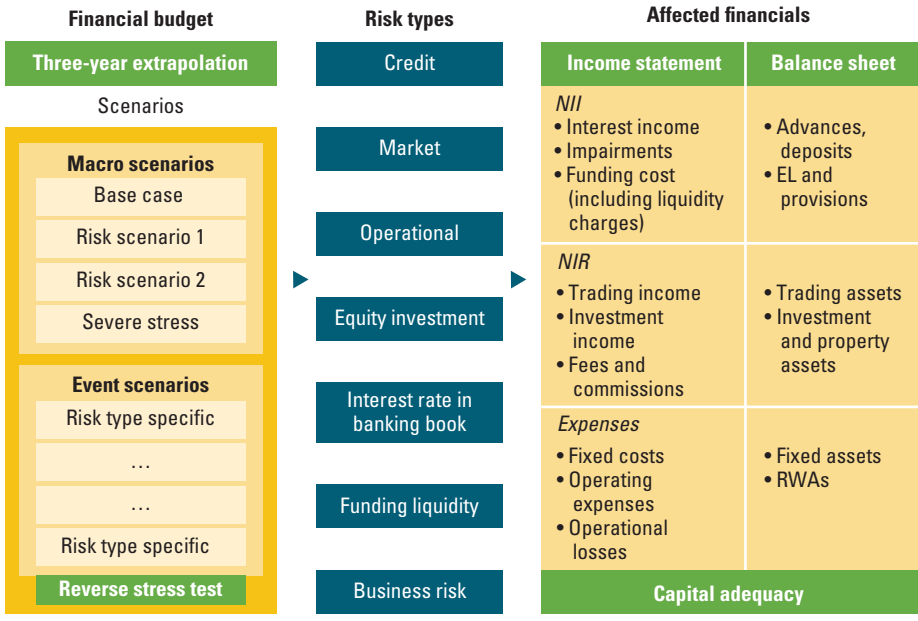


Source: South African Reserve Bank.

When selecting macroeconomic indicators or scenarios, the challenge is to determine how much each of the scenarios could affect a specific line item on the balance sheet or the income statement. Some external events would come from a single source or indicator, such as changes in interest rates, gross domestic product (GDP), or equity prices. Other risks could be caused by multifactor events such as emerging market crises, current account imbalances, house price imbalances, or external economic shocks.

Internally, an operational loss event could trigger a stress event. For example, if salaries and wages are stagnant, retail credit extension and loan losses could be affected. Each event or risk scenario can be related to a risk type and the consequent impact on the balance sheet or income statement (figure 6.9).

Figure 6.9 Linking Risk Scenarios to Financial Statements



Note: EL = expected losses; NII = net interest income; NIR = noninterest revenue; RWAs = risk-weighted assets.

Each risk scenario is then linked to its impact on capital adequacy, to ascertain whether the bank will be able to withstand such a risk shock and maintain its regulatory and market-required capital. The reaction and actions taken by management are important and may include managing

exposures by reducing risk or redirecting growth. Capital could be managed by reducing demand through less-risky assets (reducing risk-weighted assets) or increasing the supply of capital by raising capital instruments or reevaluating dividend policy.

6.6 Pillar 3: Market Discipline

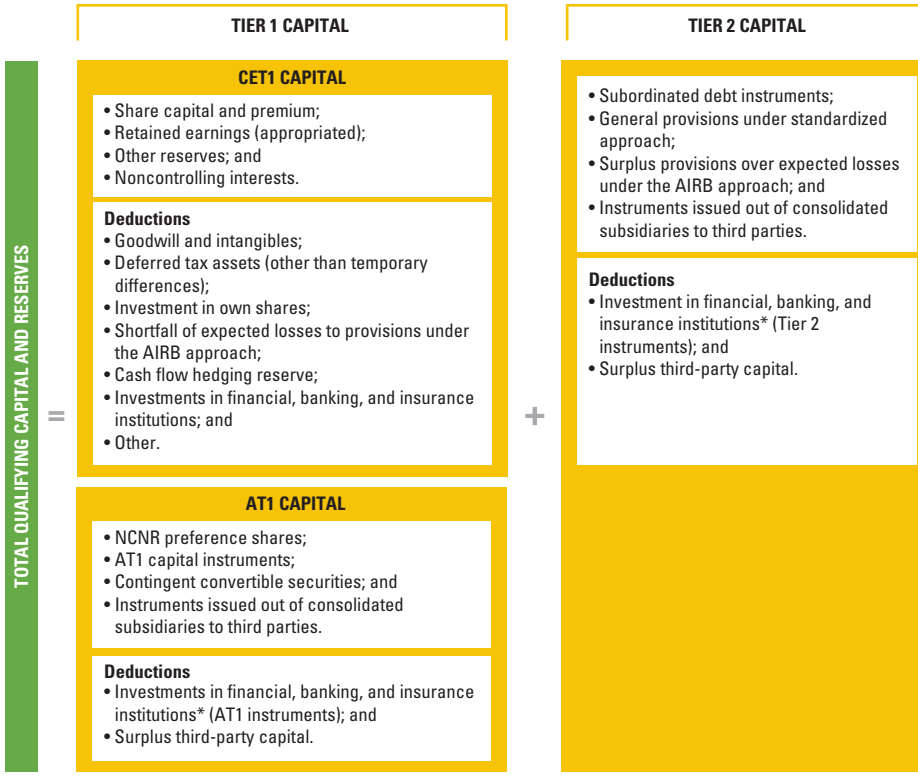
The requirement for market discipline, Pillar 3 of the Basel Accords, complements the minimum capital requirements and the supervisory review process. Market discipline is based on disclosure requirements. The banks are asked to disclose reliable, timely information needed by market participants to make well-founded risk assessments, including assessment of the adequacy of capital held as a cushion against losses and of the risk exposures that may give rise to such losses.

Pillar 3 Disclosure Requirements

The disclosure requirements are based on the materiality concept—that is, banks must include all information whose omission or misstatement could change or influence the decisions of the respective information users. The only exception is proprietary or confidential information, the sharing of which could undermine a bank's competitive position. Disclosures are normally made quarterly or semiannually. Banks are expected to have a formal disclosure policy, approved by the board of directors, that includes what will be disclosed, validation reporting frequency, and internal controls over the disclosure process.

The areas that are subject to disclosure are *capital structure, capital adequacy,* and *risk exposure and assessment* (as illustrated for two banks in figure 6.10 and table 6.6). The disclosures include qualitative and quantitative aspects. For each risk area (credit, market, operational, and equity), qualitative aspects cover strategies, policies, and processes; the structure and organization of the respective risk management function; the scope and nature of the risk measurement and reporting systems; the strategies and policies for hedging and mitigating risks; and processes and systems to monitor their effectiveness. Quantitative aspects involve disclosures of the specific values. Transparency and disclosure are further discussed in chapter 16.

Figure 6.10 Capital Adequacy and Planning



Source: FirstRand Bank 2019.

Note: AIRB = Advanced internal rating-based approach; AT1 = Additional Tier 1 capital; NCNR = Nonconvertible, nonredeemable (preference shares).

Assurance of Pillar 3 Data

The information provided by banks in the new disclosure requirements must be subject, at a minimum, to the same level of internal review and internal control processes as the information provided by banks for their financial reporting (that is, the level of assurance must be the same as for information provided within the management discussion and analysis part of the financial report).

Banks must establish a formal, board-approved disclosure policy for Pillar 3 information that sets out the internal controls and procedures for disclosure of such information. The key elements of this policy should be described in the year-end Pillar 3 report or cross-referenced to another location where they

Table 6.6 Capital Components and Adequacy, Including Leverage and Liquidity

		Footnotes	At Dec. 31, 2017
	Available tails capital ($bn)	*1*	
1	Common equity tier 1 CET 1 capital		**126.1**
2	Tier 1 capital		**151.0**
3	Total regulatory capital!		**182.4**
Risk-weighted assets (RWAs) ($bn)			
4	Total RWAs		**871.3**
Capital ratios (%)			
5	CET1		**14.5**
6	Total tier 1		**17.3**
7	Total capital		**20.9**
Additional CET1 buffer requirements as a percentage of RWA (%)			
8	Capital conservation buffer requirement		**1.25**
9	Countercyclical buffer requirement		**0.22**
10	Bank G-SIB and/or D-SIB additional requirements		**1.25**
11	Total of bank CET1 specific buffer requirements		**2.72**
12	CET1 available after meeting the bank's minimum capital requirements		**8.0**
Leverage ratio			
13	Total leverage ratio exposure measure ($bn)		**2,557.1**
14	Leverage ratio (%)	*2*	**5.6**
Liquidity coverage ratio (LCR)			
15	Total high-quality liquid assets ($bn)		**512.6**
16	Total net cash outflow ($bn)		**359.9**
17	LCR ratio (%)		**142.2**

Source: HSBC Bank, December 31, 2017.

Note: D-SIB = domestic systemically important bank; G-SIB = global systemically important bank.

1. Capital figures are reported on a transitional basis.
2. Leverage ratio is calculated on a fully phased-in basis.

are available. The board of directors and senior management are responsible for establishing and maintaining an effective internal control structure over the disclosure of financial information, including Pillar 3 disclosures. They must also ensure that appropriate review of the disclosures takes place. One or more senior officers of a bank, ideally at board level or equivalent, must attest in writing that Pillar 3 disclosures have been prepared in accordance with the board-approved internal control processes.

Banks are also required to make available on their websites the full terms and conditions of all instruments included in regulatory capital.

6.7 Management of Capital Adequacy

A bank's management continues to be accountable for the capital adequacy of its bank. The capital management process should address all material risks faced by the bank. Given its business strategy, a bank must have

- *Clearly defined capital adequacy targets*;
- *Adequate policies and processes* to identify, measure, and report all material risks;
- *A capital assessment process* that relates its capital to the risk profile; and
- *Internal control systems* that ensure the integrity of the overall capital assessment and management process.

A bank's board must also devote proper attention to all matters related to the maintenance of capital adequacy. The board has a responsibility to project capital requirements and to determine whether current growth and capital retention are sustainable, to establish sound risk management policies and effective risk management and control systems and procedures, to ensure efficient organization, and to provide adequate resources to attract and retain the necessary professional cadre.

The quality of a bank's assets must also be mentioned in the capital adequacy context. A bank's capital ratios can be rendered meaningless or highly misleading if asset quality is not considered. Particularly in low- to middle-income or transition economies, but also in high-income market economies, many banks report impressive capital ratios when they may in fact be insolvent, because they have overstated asset quality and have provisioned inadequately for losses. An accurate assessment of asset quality and of off-balance-sheet exposures and contingent liabilities is critical for an accurate assessment of capital. Similarly, accurate evaluation of provisions and loan loss reserves is a critical input in the process of capital adequacy assessment.

A bank's capital ratio may be changed by altering either the numerator or the denominator of the ratio. In most cases, to reach or maintain the necessary capital level, banks have done both. They have increased Tier 1 or Tier 2 capital by not distributing dividends and by issuing equity or subordinated debt. They have also changed the balance sheet structure by reducing total assets (for example, by cutting back loans) and by shifting into assets that bear a lower risk weight (for example, by moving from corporate loans to government securities or residential mortgages). These decisions have often been motivated by business cycles. In times of high demand, banks are more

likely to increase capital; in downturns, they prefer to reduce the size of their balance sheets.

Besides the business cycle aspects, important determinants in selecting the strategy to achieve or maintain capital adequacy include the degree of undercapitalization and the period during which a bank must reach the minimum level of capital. If a bank's condition deteriorates, its options for raising capital become increasingly limited and, at the same time, more expensive. This argues for a bank to maintain capital in excess of regulatory minimums. If its asset quality deteriorates, or if undercapitalization is serious and the time is short, then raising new capital immediately is the only effective solution. Hoping that the problem will solve itself is a fool's game that will cost the bank far more in the long run. Rapid shrinking of the balance sheet often means that a bank is shedding its highest-quality or most-liquid assets. This masks the problem in the short run but creates an even larger problem in the medium term.

The introduction of capital adequacy standards has also motivated regulatory capital arbitrage, reflecting banks' efforts to keep their funding cost, including equity, as low as possible. Because the cost of equity is generally perceived as much greater than the cost of debt, banks that would otherwise keep lower capital see the imposition of capital adequacy as a form of regulatory taxation. As with other such forms of taxation, some banks develop methods to minimize the taxes. In practice, capital arbitrage has often exploited the differences between true economic risk and credit risk as measured by the Basel Accords' risk-weighting methodology. Capital arbitrage can be exercised in a number of ways, including shifting the asset composition toward less-weighted assets through some form of securitization or by creating credit substitutes (which also carry lower risk weights).

6.8 Analysis of a Bank's Capital Adequacy

Capital adequacy analysis comprises three steps:

- Analysis of the structure of qualifying capital (table 6.7)
- Analysis of the bank's risk profile and risk exposures (figure 6.11)
- Evaluation of the bank's current and future capital needs (table 6.8).

There are no conceptual differences between the Basel I and Basel III Accords in the approach to the capital adequacy assessment; the approach is essentially the same in both. However, the analysis of the bank risk profile and risk exposures and the assignment of risk weights are much more complex under Basel III because of the use of more complex methodologies (which are more sensitive and better attuned to capture the risk profiles of banks' business lines). Therefore, while illustrating the elements of the capital adequacy assessment process, the following discussion will make references to Basel I to keep the discussion simple and to the point.

Analysis of the Structure of Qualifying Capital

The capital adequacy assessment starts with analysis of the components of a bank's capital (tables 6.7 and 6.8). The Tier 1 core capital components, including common stock and retained earnings, should account for at least 75 percent of Tier 1 capital as well as the total capital. The shareholding structure and the identity of larger shareholders are also important. Increasingly, the shareholders may be called upon to increase a bank's capital, either by adding new capital or by forgoing dividend payments. However, no amount of capital would be adequate for a bank with malevolent shareholders, incompetent management, or an incompetent board of directors.

Once the denominators corresponding to credit, market, and operational risk of a bank are determined, the capital adequacy ratio calculation is straightforward. Table 6.7 illustrates selected capital adequacy ratios of a bank, as shown earlier in table 6.1 but adding their trends over time.

When a bank's capital adequacy ratio shows deterioration, it is a cause for concern. The reason could be that the bank has increased the size of its balance sheet while still meeting minimum capital requirements. Should the growth trend continue, it would mean that the bank would have to increase capital to be able to maintain the minimum capital ratio. Another reason for a deteriorating capital ratio could be that the bank has changed its risk profile. In such a case, the analyst should investigate whether the bank has adequate policies, procedures, and controls in place to effectively handle the higher risk profile of its operations.

Any changes in capital structure, especially reductions involving core capital, should be credibly explained. A careful analysis is also needed in situations where a reduction of capital is indicated, to explain exactly why

Table 6.7 Components of a Bank's Capital Structure over Five Periods

Capital adequacy	Limitations	Qualifying instruments: selected examples	Period 1	Period 2	Period 3	Period 4	Period 5
Credit risk-weighted assets: on balance sheet							
Credit risk-weighted assets: off balance sheet							
Market risk-weighted assets							
Operational risk-weighted assets							
Qualifying capital to total risk-weighted assets	Minimum of 8 percent						
Total Tier 1 capital	Minimum of 6 percent						
Common equity	Minimum 4.5 percent	Common shares, retained earnings, disclosed reserves					
Additional Tier 1 capital instruments	Limited to 1.5 percent	Share premiums on common shares, perpetual capital instruments, minority capital					
Tier 2 capital	Maximum of 2 percent (at 8 percent capital adequacy)						
Additional Tier 1 instruments that exceed the 1.5 percent maximum		Perpetual capital instruments, minority capital					
Other Tier 2 instruments		Subordinated term debt, general provisions, and loss reserves					
Capital conservation buffer	2.5 percent made up of common equity	Common equity					
Other							
Countercyclical capital instruments	Up to 2.5 percent based on specific bank circumstances	Common equity (an extension of the conservation buffer)					
Leverage ratio	Maximum 3 percent	Tier 1 capital to total assets may not exceed 3 percent					

Table 6.8 Illustration of Capital Adequacy: Actual versus Required Capital

Capital Adequacy—Trend Analysis	Current period	Future period 1	Future period 2	Future period 3	Future period 4
Total assets	1,041,047	1,561,621	2,028,662	3,031,081	3,686,900
Shareholders' equity—all qualifying capital	111,941	149,991	179,948	264,354	313,237
Common equity component of equity	82,510	107,745	126,466	174,502	200,839
Risk-weighted assets	840,890	1,207,020	1,528,046	2,567,208	3,211,383
Minimum Tier 1 common equity requirement—4.5% of RWA	37,840	54,316	68,762	115,524	144,512
Additional Tier 1 capital—limited to 1.5% of the 6% minimum T1 capital	12,613	18,105	22,921	38,508	48,171
Required Tier 1 capital—minimum 6% of RWA	50,453	72,421	91,683	154,032	192,683
Tier 2 capital—limited to 2% of RWA	16,818	24,140	30,561	51,344	64,228
Minimum capital to be held—8% of RWA	67,271	96,562	122,244	205,377	256,911
Excess capital—all common equity	32,057	35,324	34,783	20,470	8,156
Capital conservation buffer—2.5% of RWA	21,022	30,175	38,201	64,180	80,285
Countercyclical buffer—assume 1.5% of RWA	12,613	18,105	22,921	38,508	48,171
Required capital @ 10.5% of risk-weighted assets—assuming a 2.5% capital conservation buffer only	88,293	126,737	160,445	269,557	337,195
Required capital @ 12% of risk-weighted assets (assuming a countercyclical buffer of 1.5% add-on)	100,907	144,842	183,365	308,065	385,366
Capital adequacy ratio	13.31	12.43	11.78	10.30	9.75
Excess/(deficit) @ 10.5% required capital	23,648	23,254	19,503	(5,203)	(23,958)
Excess/(deficit) @ 12.5% required capital (8% + 2.5% + 1.5%)	11,034	5,148	(3,418)	(43,711)	(72,129)

Note: RWA = risk-weighted assets; T1 = Tier 1.

the loss of capital occurred and what provoked it as well as to ensure that the bank has learned from the experience and taken adequate measures to prevent a similar situation in the future. The analyst could also compare the changes in capital volume to the bank's risk profile. In general, the changes in capital volume should be in concert with the expected changes in the risk profile to provide an adequate cushion for the bank's risk exposures.

In addition to analyzing the structure of the bank's capital base, one should consider the level and demand for dividends being placed on the bank by shareholders. In periods of economic downturn or situations where the bank's condition is deteriorating, the bank should reduce or eliminate dividend payments to its shareholders.

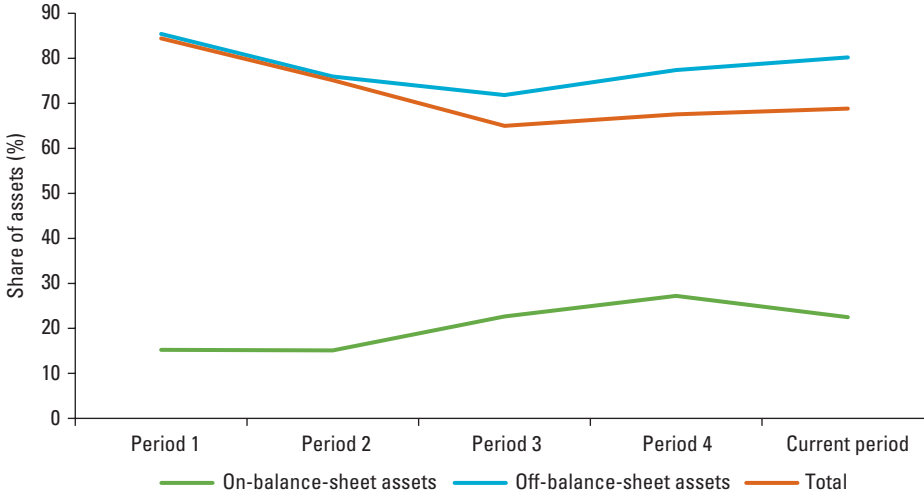
Analysis of Risk Profile and Risk Exposures

The next step in the capital adequacy assessment is the assessment of the bank's risk exposures. This includes credit risk, market risk, and operational risk. Starting with the credit risk, the bank's on- and off-balance-sheet asset categories are classified according to the risk categories specified in Basel I (or subject to the analysis using the approach agreed upon with the supervisory authority under Basel II) and are assigned the corresponding risk weight.

The analyst should notice the structure of risk-weighted assets and whether and how this has changed over time. Whenever there are changes in risk weights, the questions to be addressed are whether this is a result of the bank's business strategy decisions, whether the risk weights reflect actual risk, whether the bank is able to understand and adequately manage the higher level of risk, and what appears to be the trend for the future.

Figure 6.11 illustrates a summary risk-weighted profile of a bank, with changes in the risk profile over time in terms of average risk weighting, including on- and off-balance-sheet items. It also projects future trends. It appears that the weighted average of the bank's total risk profile has been reduced during the observation period. The analyst should understand why that has occurred and what the trend is. For example, the total average could have been reduced because the bank increased its off-balance-sheet business. The weighted average of on-balance-sheet items could have been reduced because the bank started to engage in regulatory capital arbitrage or because of changes in its demand structure.

Figure 6.11 A Bank's Risk-Weighted Profile of On- and Off-Balance-Sheet Items



Evaluation of Current and Future Capital Needs

The trend analysis is illustrated in table 6.8, which traces a bank's capital over time (in the context of Basel III). The qualifying capital is compared with the capital necessary to meet 10.5 percent and 12 percent risk-weighted minimum capital requirements (assuming an add-on for a capital conservation buffer of 2.5 percent and a countercyclical buffer of 1.5 percent). The bank under review demonstrates the capacity to significantly increase its capital, in line with anticipated growth in its risk-weighted capital ratios. This situation likely indicates that this bank is positioning itself for future growth. Although capital adequacy is clearly not an issue at the moment, this calls for a review of the bank's internal processes and controls to ensure that it is adequately prepared to handle the increasing volume of business and, most likely, the increasing degree of risk.

The next question to be addressed is whether a bank can continue to meet its minimum capital requirements in the future, in line with its planned expansion. Analysis of this question should include stress tests for situations that might arise in which risk or the bank's capacity to control risk could get out of hand. Table 6.8 illustrates anticipated capital adequacy needs as part of the process of risk management and capital planning.

The analyst should consider the legal and regulatory options available when a capital shortfall is predicted (table 6.8, future periods 2, 3, and 4) and, more importantly, whether the regulator is willing to take strong action when required. The bank's strategy to raise more capital must be realistic; otherwise, the regulator should restrict the bank's growth, payment of dividends—or a combination of actions.

The same table can be used to project risk-weighted asset growth from the current period into the future. Any expected growth in the bank's business activities will clearly result in a capital shortfall, given even the current situation. A bank may take a number of actions to address an expected shortfall in capital adequacy, including the following:

- *Tier 1 capital increase,* by asking shareholders to add capital, by retaining earnings, or by issuing new shares in the market
- *Tier 2 capital increase* (if there is space for this in the bank's capital structure) by issuing the appropriate instruments
- *Change of business policy* to focus on business with lower capital requirements
- *Reduction in the size* of its balance sheet or of its growth.

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7

Credit Risk Management

KEY MESSAGES

- Credit risk management lies at the heart of survival for the vast majority of banks.
- Credit risk can be reduced by implementing policies to limit connected-party lending and large exposures to related parties.
- Asset classification and subsequent provisioning against possible losses affect not only the value of the loan portfolio but also the underlying value of a bank's capital.
- The profile of customers (*whom* the bank has lent to) must be transparent.
- Risks associated with the key banking products (*what* the bank has lent) must be understood and managed.
- The maturity profile of loan products (*how long* the loans are for) interacts strongly with liquidity risk management.
- A bank's capacity for risk management will contribute significantly to the quality of its risk management practices.

7.1 Establishing Credit Risk Management Policies

Credit or counterparty risk is the chance that a debtor or issuer of a financial instrument—whether an individual, a company, or a country—will not repay principal and other investment-related cash flows according to the terms specified in a credit agreement. Inherent to banking, credit risk means that payments may be delayed or not made at all, which can cause cash flow problems and affect a bank's liquidity. Despite innovation in the financial services sector, more than 70 percent of a bank's balance sheet generally relates to this aspect of risk management. For this reason, credit risk is the principal cause of bank failures. Although the discussion of the credit risk management function is primarily focused on the loan portfolio, the principles relating to the

determination of creditworthiness apply equally to the assessment of counterparties that issue financial instruments.

Financial analysts as well as bank supervisory agencies place considerable importance on formal policies laid down by the board of directors and implemented or administered by management. A lending or financing policy should outline the scope and allocation of a bank's credit facilities and the manner in which a credit portfolio is managed—that is, how investment and financing assets are originated, appraised, supervised, and collected. A good policy is not overly restrictive and allows for the presentation of proposals to the board that officers believe are worthy of consideration, even if they do not fall within the parameters of written guidelines. Flexibility is needed to allow for fast reaction and early adaptation to changing conditions in a bank's mix of assets and the market environment.

Virtually all regulators prescribe minimum standards for managing credit risk. These cover the identification of existing and potential risks, the definition of policies that express the bank's risk management philosophy, and the setting of parameters within which credit risk will be controlled.

Typically three kinds of policies are related to credit risk management. One set aims to *limit or reduce credit risk*. The related policies include policies on concentration and large exposures, diversification, lending to connected parties, and overexposure. The second aims to assess the credit risk exposure through *asset classification*. This requires periodic evaluation of the collectability of the portfolio of credit instruments. The third set aims to make *provisions for potential loss* or make allowances at a level adequate to absorb the anticipated loss.

7.2 Regulatory Policies to Limit Credit Risk

To reduce or limit exposures, regulators pay close attention to three issues: exposure to a single customer, related-party financing, and overexposure to a geographic area or economic sector (as discussed in section 7.3).

Large Exposures to a Single Customer or Connected Parties

Large-exposure and concentration limits usually refer to the maximum permitted exposure to a single client, connected group, or sector of economic activity (for example, agriculture, steel, or textiles). This is especially important for small, regionally oriented, or specialized banks. A lending policy should also require that all concentrations be reviewed and reported frequently.

Modern prudential regulations usually stipulate that a bank refrain from investing in or extending credit to any individual entity or related group of entities in excess of a prescribed percentage of the bank's capital and reserves. Most countries impose a single-customer exposure limit of 10–25 percent of capital. The threshold at which reporting to supervisory authorities becomes necessary should normally be set somewhere below the maximum exposure limit. Supervisors can then devote special attention to exposures above the threshold and require banks to take precautionary measures before concentration becomes excessively risky.

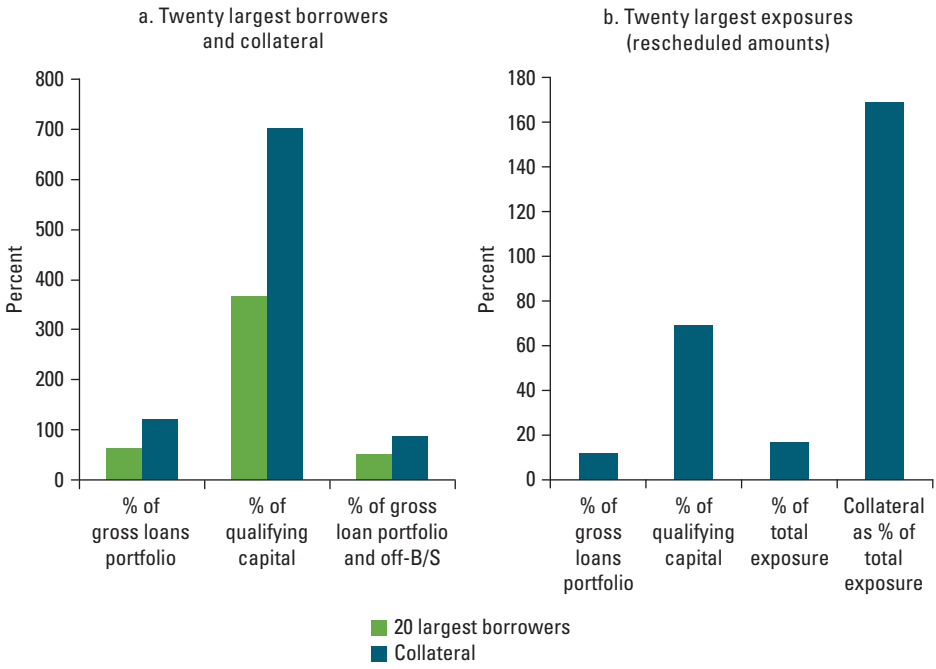
The main difficulty in defining exposure is to quantify the extent to which less-direct forms of credit exposure should be included within the exposure limit. As a matter of principle, contingent liabilities and credit substitutes—such as guarantees, acceptances, letters of credit, and all future commitments—should be included, although the treatment of specific instruments may vary. For example, a financial obligation guarantee may be treated differently than a performance risk guarantee. The treatment of collateral is another contentious issue because the valuation of collateral can be highly subjective. As a matter of prudence, collateral should not be considered when determining the size of an exposure.

Another conceptual question is the definition of the term "single client." According to international practice, a single client is an individual, legal person, or a connected group to which a bank is exposed. A "connected group" covers clients that are mutually associated or control other clients, either directly or indirectly, normally through a voting right of at least 15–20 percent, a dominant shareholding, or the capacity to control policy making and management. In addition, the exposure to multiple single clients may represent a cumulative risk if financial interdependence exists and their expected source of repayment is the same. (See figure 7.1 for a hypothetical example.)

In practical terms, a large exposure usually indicates the bank's commitment to support a specific client. Here the risk is that a bank that extends credit to a large corporate client may not be objective in appraising the risks associated with such credit.

The management of large exposures involves an additional aspect: the bank's ability to identify common or related ownership, to exercise effective control, and to rely on common cash flows to meet its own obligations. Particularly in the case of large clients, banks must pay attention to the completeness and adequacy of information about the debtor. Bank credit officers should monitor events affecting large clients and their performance on an

Figure 7.1 A Bank's Exposure to Top 20 Clients



Note: B/S = balance sheet.

ongoing basis, regardless of whether they are meeting their obligations. When external events present a cause for concern, credit officers should request additional information from the debtor. If there is any reason to believe that the person or group receiving the investment or financing might have difficulty meeting its obligation to the bank, the concerns should be raised with a higher level of credit risk management, and a contingency plan for addressing the issue should be developed.

Related-Party Financing

Dealing with related or connected parties is a particularly dangerous form of credit risk exposure. Related parties typically include a bank's parent, major shareholders, subsidiaries, affiliate companies, directors, and executive officers. Such parties are in a position to exert control over or influence a bank's policies and decision making, especially concerning credit decisions. A bank's ability to identify and track extensions of credit to insiders is crucial (table 7.1).

Table 7.1 Data for Monitoring a Bank's Related-Party Lending

Related party	Amount of loans	Amount of weak loans	Share of loans (% of qualifying capital)	Share of weak loans (% of qualifying capital)	Collateral held
Shareholders holding > 5 percent of shares					
Shareholders holding < 5 percent of shares					
Shareholders of any shareholders					
Board of directors					
Executive management					
Entities controlled by the bank					
Entities having control over the bank					
Close relative to any of the above					
Total					

The issue is whether credit decisions are made on a rational basis and according to the bank's policies and procedures. An additional concern is whether credit is based on market terms or on terms that are more favorable regarding amount, maturity, rate, and collateral than those provided to the general public.

Most regulators establish limits for related parties, typically stipulating that total credit to related parties cannot exceed a certain percentage of Tier 1 or total qualifying capital. If prudential regulations have not established such a limit, the bank should maintain one as a matter of board policy. Prudent banking practice requires board approval of all facilities extended to related parties.

7.3 Bank-Specific Policies and Actions to Reduce Credit Risk

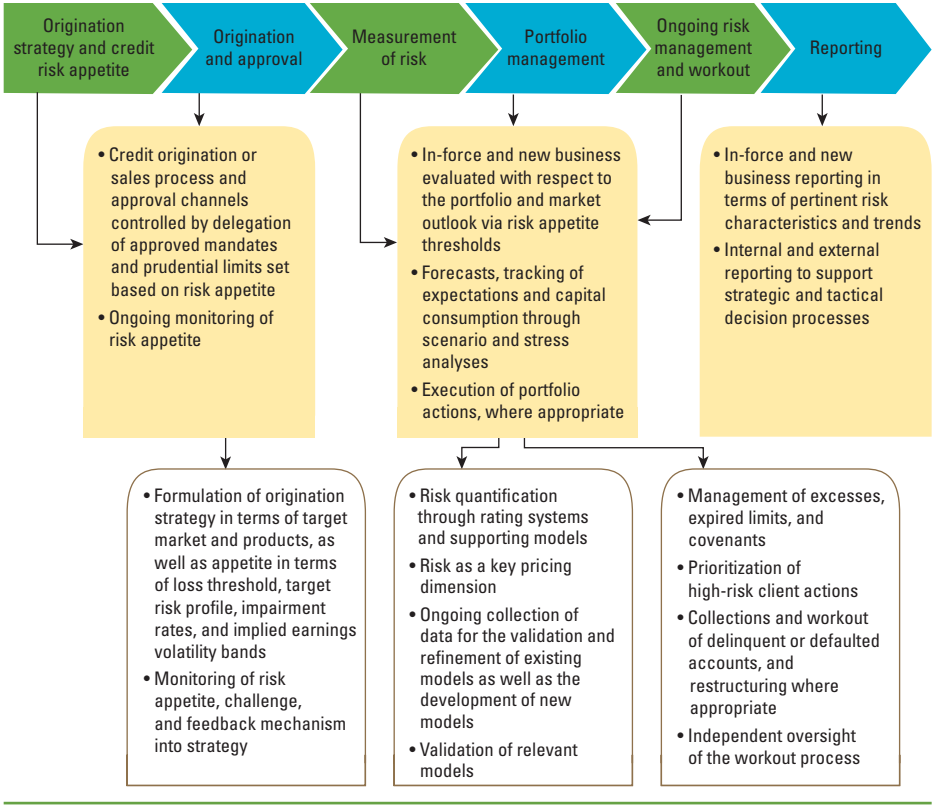
A lending policy should contain an outline of the scope and allocation of a bank's credit facilities and the manner in which a credit portfolio is managed—that is, how loans are originated, appraised, supervised, and collected. As stated earlier, a good lending policy is not overly restrictive but allows for the presentation of loans to the board that officers believe are worthy of consideration,

even if they do not fall within the parameters of written guidelines. Flexibility must exist to allow for fast reaction and early adaptation to changing conditions in a bank's earning assets mix and market environment.

Sound lending policies comprise several elements. Figure 7.2 provides an overview of such policies at South Africa's FirstRand Bank, in sequence of the applicable stage of the credit risk identification and management process. Several aspects of credit risk reduction policies are also described below.

Lending authority. Lending authority is often determined by the bank's size. In smaller banks, it is typically centralized. To avoid delays in the lending process, larger banks tend to decentralize according to geographical area, lending products, and types of customers. A lending policy should establish limits for all lending officers. If policies are clearly established and enforced, individual limitations may be somewhat higher than would normally be expected,

Figure 7.2 Scope of Credit Risk Management and Identification Practices



Source: FirstRAND Bank.

depending on the officer's experience and tenure with the bank. Lending limits could also be based on group authority, which would allow a committee to approve larger loans. Reporting procedures and the frequency of committee meetings should be specified.

Type of loans and distribution by category. A lending policy should specify the types of loans and other credit instruments that the bank intends to offer to clients and should provide guidelines for specific loans. Decisions about types of credit instruments should be based on the expertise of lending officers, the deposit structure of a bank, and anticipated credit demand. Types of credit that have resulted in an abnormal loss should be controlled by senior management or avoided completely. Limitations based on aggregate percentages of total loans in commercial, real estate, consumer, or other credit categories are common. Policies related to such limitations should allow for deviations that are approved by the board.

Appraisal process. A lending policy should outline where the responsibility for appraisals lies and should define formal, standard appraisal procedures, including reference to reappraisals of renewals or extensions. Acceptable types and limits on the amounts to be appraised should be outlined for each type of credit facility. Circumstances requiring appraisals by qualified independent appraisers should also be described. The ratio of the amount of the loan to the appraised value of both the project and collateral, as well as the method of valuation and differences among various types of lending instruments, should be detailed. A lending policy should also contain a schedule of down payment requirements, where applicable.

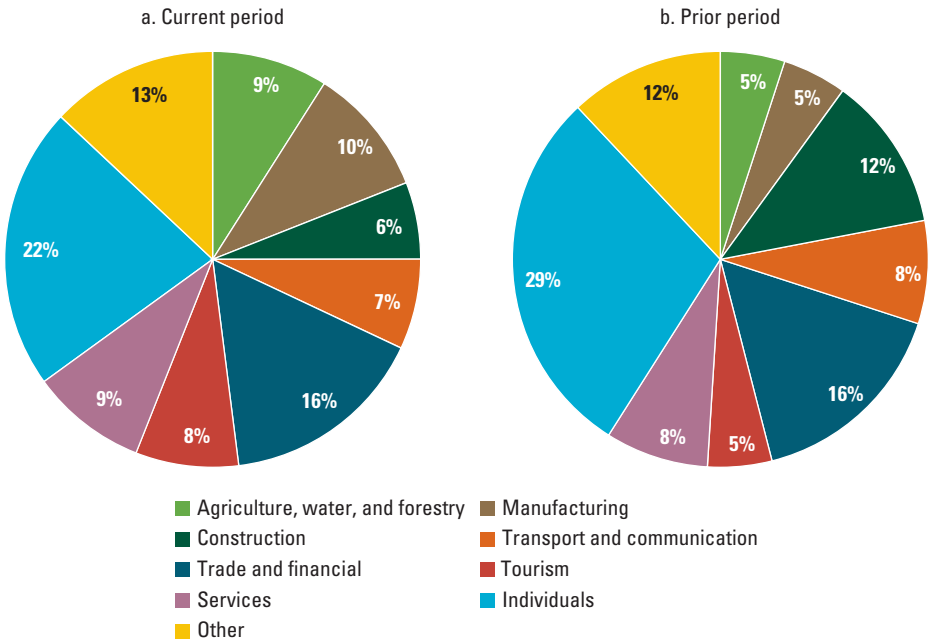
Loan pricing. Rates on various loan types must be sufficient to cover the costs of funds, loan supervision, administration (including general overhead), and probable losses. At the same time, rates should provide a reasonable profit margin. Rates should be periodically reviewed and adjusted to reflect changes in costs or competitive factors. Rate differentials may be deliberately maintained either to encourage some types of borrowers to seek credit elsewhere or to attract a specific type of borrower. Guidelines for other relevant procedures (such as the determination of fees on commitments or penalty interest rates) are also an element of pricing policy.

Maturities. A lending policy should establish the maximum maturity for each type of credit, and loans should be granted with a realistic repayment schedule. Maturity scheduling should be determined in relation to the anticipated source of repayment, the purpose of the loan, and the useful life of the collateral.

Exposure to geographic areas or economic sectors. Another dimension of risk concentration is the exposure of a bank to a single sector of the economy or a narrow geographic region (figure 7.3). This makes a bank vulnerable to weaknesses in a particular industry or region and poses a risk that it will suffer from simultaneous failures among several clients for similar reasons. This concern is particularly relevant for regional and specialized banks or banks in small countries with narrow economic profiles, such as those with predominantly agricultural economies or exporters of a single commodity.

It is often difficult to assess a bank's exposure to various sectors of the economy because most bank reporting systems do not produce such information. For example, a holding company of a large, diversified group could be used to finance projects in various industries in which the company operates. In any case, banks should have well-developed systems to monitor sector risks, assess the impact of adverse trends on the quality of their portfolios and income statements, and deal with increased risk.

Figure 7.3 Sectoral Analysis of Loans



Banks engaged in international lending face additional risks, the most important of which are country (or sovereign) and transfer risks. Country risks encompass the entire spectrum of risks posed by a country's macroeconomic, political, and social environment that may affect the performance of clients. Transfer risks are the difficulties that a client might have in obtaining the foreign exchange needed to service a bank's obligations. The classification of international loans should normally include both country and transfer risks. A bank may be asked to provision for international loans on a loan-by-loan basis, whereby the level of necessary provisions is raised to accommodate additional risk. Alternatively, a bank may determine aggregate exposures to country and transfer risks on a country-by-country basis and provide special reserves to accommodate risk exposures.

Insistence on availability of current financial information. The safe extension of credit depends on complete and accurate information regarding every detail of the borrower's credit standing. A possible exception to this rule is the case in which a loan was originally approved with readily marketable collateral to be used as the source of repayment.

A lending policy should define the financial statement requirements for businesses and individuals at various borrowing levels and should include appropriate guidelines for audited, unaudited, interim, cash flow, and other statements. It should include external credit checks required at the time of periodic updates. If the loan maturity is longer than one year, the policy should require that the bank's officers prepare financial projections with the horizon equivalent to the loan maturity, to ensure that the loan can be repaid from cash flow. The assumptions for the projections should be clearly outlined. All requirements should be defined so that any negative credit data would clearly indicate a violation of the bank's lending policy.

Collections monitoring. A lending policy should define delinquent obligations of all types and specify the appropriate reports to be submitted to the board. These reports should include sufficient detail to allow for the determination of the risk factor, loss potential, and alternative courses of action. The policy should require a follow-up collection procedure that is systematic and becomes progressively stronger. Guidelines should be established to ensure that all major problem loans are presented to and reviewed by the board.

Limit on total outstanding loans. A limit on the total loan portfolio is usually expressed relative to deposits, capital, or total assets. In setting such a limit, factors such as credit demand, the volatility of deposits, and credit risks should be considered.

Maximum ratio of loan amount to the market value of pledged securities. A lending policy should set forth margin requirements for all types of securities that are accepted as collateral. Margin requirements should be related to the marketability of securities. A lending policy should also assign responsibility and establish a timetable for periodic pricing of collateral.

Impairment recognition. A bank should have policies in place to systematically identify and recognize the impairment of a loan or a collectively assessed group of loans. This should be done whenever a bank will likely be unable to collect the amounts due according to the loan agreement. Impairment can be recognized by reducing the carrying amount of the loan to its estimated realizable value through an existing allowance or by charging the income statement during the period in which the impairment occurs.

Renegotiated debt treatment. Renegotiated debt refers to loans that have been restructured to provide a reduction of either interest or principal payments because of the borrower's deteriorated financial position. A loan that is extended or renewed with terms that are equal to those applied to new debt with similar risk should not be considered renegotiated debt. Restructuring may involve a transfer from the borrower to the bank of real estate, receivables or other assets from third parties, a debt-to-equity swap in full or partial satisfaction of the loan, or the addition of a new debtor to the original borrower.

A good practice is to have such transactions approved by the board of directors before concessions are made to a borrower. Bank policies should also ensure that such items are properly handled from an accounting and control standpoint. A bank should measure a restructured loan by reducing its recorded investment to a net realizable value, considering the cost of all the concessions at the date of restructuring. The reduction should be recorded as a charge to the income statement for the period in which the loan is restructured. A significant amount of renegotiated debt is normally a sign that a bank is experiencing problems. An exception to this general approach applies in a market environment of falling interest rates, when it may be in the interest of both debtors and creditors to renegotiate the original credit terms.

Written internal guidelines. Finally, a lending policy should be supplemented with other written guidelines for specific bank departments. Written policies and procedures that are approved and enforced in various departments should be referenced in a bank's general lending policy. The absence of written policies, guidelines, and procedures is a major deficiency and a sign that a board of directors is not properly executing its fiduciary responsibilities.

Loan portfolio review. A loan portfolio reflects a bank's market position and demand, its business and risk strategy, and its credit extension capabilities. When feasible, the loan portfolio review should normally include a random sampling of loans so that approximately 70 percent of the total loan amount and 30 percent of the number of loans are covered. It should also consider at least 75 percent of the total loan amount and 50 percent of the number of all foreign currency loans and of all loans with maturities greater than one year. In addition, a detailed credit portfolio review should include the following:

- All loans to borrowers with aggregate exposure larger than 5 percent of the bank's capital
- All loans to shareholders and connected parties
- All loans for which the interest or repayment terms have been rescheduled or otherwise altered since the granting of the loan
- All loans for which cash payment of interest or principal is more than 30 days past due, including those for which interest has been capitalized or rolled over
- All loans classified as substandard, doubtful, or loss.

In each of these cases, a loan review should consider documentation in the borrower's file (box 7.1) and involve a discussion with the responsible credit officer of the borrower's business, near-term prospects, and credit history. When the total amount due exceeds 5 percent of a bank's capital, the analysis should also consider the borrower's business plans for the future and the potential consequences for debt service capacity and principal repayment.

Assessments of asset value should be performed systematically, consistently over time, and in conformity with objective criteria. They should also be supported by adequate documentation.

Estimates of the level of necessary loan loss provisions have historically included a degree of subjectivity. However, management discretion should be exercised in accordance with established policies and procedures. In addition, International Financial Reporting Standard 9 (IFRS 9) (see chapter 16, section 16.5 and table 16.1) requires a forward-looking approach to estimated loan losses and consequent provisioning.[1] Jurisdictions where prescriptive provisioning still applies and where state-owned banks often do not face reality regarding the quality of their assets will have a difficult choice in the future: either comply with the Basel Accords and IFRS or risk lack of credibility when reporting financial information to international counterparts, the International Monetary Fund (IMF), and the World Bank. An analyst faced with a system

BOX 7.1 Content of a Loan Review File

For each of the loans reviewed, a summary file should be made showing the following:

- Borrower's name and line of business
- Use of proceeds
- Date credit was granted
- Loan maturity date, amount, currency, and interest rate
- Principal source of repayment
- Nature and value of collateral or security (or valuation basis, if a fixed asset)
- Total outstanding liabilities, including loan principal and interest due and all other real and contingent liabilities, in cases where the bank is absorbing the credit risk
- Delinquency or nonperformance, if any
- Description of monitoring activities undertaken for the loan
- Financial information, including current financial statements and other pertinent information
- Specific provisions that are required and available.

where public sector authorities refuse to adapt to these changes faces a difficult situation because financial statements become unreliable as a basis for any decisions.

An analysis of adequacy of the overall allowance for losses should include the following aspects:

- *A survey of the bank's existing provisioning policy* and the methodology used to carry it out, particularly considering the value attributed to collateral and its legal and operational enforceability
- *An overview of asset classification procedures* and the review process, including the time allotted for review
- *Determination of the current factors that are likely to cause losses* associated with a bank's portfolio and that differ from the historical experience of loss, including changes in a bank's economic and business conditions or in its clients, external factors, or alterations of bank procedures since the last review

- *A trend analysis* over a longer period, which serves to highlight any increases in overdue loans and the impact of such increases
- *An opinion of the adequacy of the current policy* and, on the basis of the loans reviewed, extrapolation of additional provisions necessary to bring the bank's total loan loss provisions in line with the IFRS.

Interbank deposits. Beyond loans, interbank deposits are the most important category of assets for which a bank carries credit risk. This category may account for a significant percentage of a bank's balance sheet, particularly in countries that lack convertibility but allow their citizens and economic agents to maintain foreign exchange deposits. Other reasons for interbank deposits are the facilitation of fund transfers, the settlement of securities transactions, or other banks' ability to perform certain services more economically or efficiently because of their size or geographical location. A review of interbank lending typically focuses on the following aspects:

- Establishment and observation of counterparty credit limits, including a description of existing credit limit policy
- Any interbank credits for which specific provisions should be made
- Method and accuracy of reconciliation of nostro and vostro accounts
- Any interbank credits with terms of pricing that are not the market norm
- Concentration of interbank exposure, with a detailed listing of banks and amounts outstanding as well as lending limits.

From a credit risk management perspective, interbank deposits should be treated just like any other credit risk exposure. A bank's policy should require that correspondent banks be carefully reviewed for exposure limits as well as their ability to provide adequate collateral. Banks from regulatory environments that are strict, well supervised, and in tune with international standards are customarily treated as a lesser risk than banks from low- and middle-income countries.

Off-balance-sheet commitments. All off-balance-sheet commitments that incur credit exposure should also be reviewed. An assessment should be made of the adequacy of credit risk analysis procedures and the supervision and administration of off-balance-sheet credit instruments such as guarantees. An off-balance-sheet portfolio review should be carried out with the same principles and in a manner similar to a loan portfolio review. The key objective of a review of individual off-balance-sheet items is to assess the client's ability to meet particular financial commitments in a timely manner.

Overdue interest. To avoid the overstatement of income and ensure timely recognition of nonperforming assets, bank policies should require appropriate action on uncollected interest. Two basic methods exist for handling both the suspension and nonaccrual of interest. First, in cases where the interest is suspended, it is accrued or capitalized, and an offsetting accounting entry is made for a category called "interest in suspense." For reporting purposes, the two entries must be netted; otherwise the assets will be inflated.

Second, when a bank places a loan in nonaccrual status, it should reverse uncollected interest against corresponding income and balance sheet accounts. For interest accrued in the current accounting period, the deduction should be made directly from current interest income. For prior accounting periods, a bank should charge the reserve for possible loan losses or, if accrued interest provisions have not been provided, the charge should be expensed against current earnings. A nonaccruing loan is normally restored to accruing status after both principal and interest in arrears have been repaid or when prospects for future contractual payments are no longer in doubt.

In some jurisdictions, a bank may avoid acting on interest in arrears if the obligation is well secured or the process of collection is under way. A debt is considered to be well secured if it is backed by collateral in the form of liens on or pledges of real or personal property. Such collateral, including securities, must have a realizable value that is sufficient to discharge the debt in full according to contract terms or by a financially responsible party. A debt is "in the process of collection" if collection is proceeding in due course, either through legal action or through collection efforts that are expected to result in repayment of the debt or in its restoration to current status.

7.4 Asset Classification

The characteristics and quality of a bank's loan portfolio are assessed through a review process. The specific objective of these reviews is to assess the likelihood that the credit will be repaid as well as whether the bank's proposed classification of the loan is adequate. Other considerations include the quality of collateral held and the ability of the borrower's business to generate the necessary cash.

Asset classification is a process whereby an asset is assigned a grade for credit risk, which is determined by the likelihood that obligations will be serviced and liquidated according to the terms of the contract. In general, all assets for which a bank is taking a risk should be classified, including advances,

accounts receivable, investment and financing assets, equity participations, and contingent liabilities.

Asset classification is one of the key tools of credit risk management. Assets are classified at the time of origination and then reviewed and reclassified as necessary (according to the degree of credit risk) a few times a year. The review should consider loan service performance and the client's financial condition. Economic trends and changes in the market for goods, and the prices of those goods, also affect evaluation of loan repayment. Assets classified as "pass" or "watch" are typically reviewed twice a year, and critical assets are reviewed at least quarterly.

Traditional Classification Categories

Banks determine classifications by themselves but follow standards that are normally set by regulatory authorities. Prudential regulations traditionally required asset classification in five categories, reflecting the probability of timely debt service. With the introduction of IFRS 9, more-complex "expected loss" methodologies are being introduced, and the methodology described below is expected to become less important over time. The five standard asset classification categories are defined below.

Standard, or pass. This classification applies when debt service capacity is considered to be beyond any doubt. In general, loans and other assets that are fully secured (including principal and interest) by cash or cash substitutes (for example, bank certificates of deposit and treasury bills and notes) are usually classified as standard regardless of arrears or other adverse credit factors.

Specially mentioned, or watch. This classification indicates assets with potential weaknesses that may, if not checked or corrected, weaken the asset as a whole or potentially jeopardize a borrower's repayment capacity in the future. This, for example, includes credit given through an inadequate loan agreement, with a lack of control over collateral, or lacking proper documentation. Loans to borrowers operating under economic or market conditions that may negatively affect the borrower in the future should receive this classification. This also applies to borrowers with an adverse trend in their operations or an unbalanced position in the balance sheet but that have not reached a point where repayment is jeopardized.

Substandard. This classification indicates well-defined credit weaknesses that jeopardize debt service capacity, in particular when the primary sources of repayment are insufficient and the bank must look to

secondary sources for repayment, such as collateral, the sale of a fixed asset, refinancing, or fresh capital. Substandard assets typically take the form of term credits to borrowers whose cash flow may not be sufficient to meet currently maturing debts or loans as well as advances to borrowers that are significantly undercapitalized. They may also include short-term loans and advances to borrowers for which the inventory-to-cash cycle is insufficient to repay the debt at maturity. Nonperforming assets that are at least 90 days overdue are normally classified as substandard, as are renegotiated loans and advances for which delinquent interest has been paid from the borrower's own funds before renegotiations and until sustained performance under a realistic repayment program has been achieved.

Doubtful. Such assets have the same weaknesses as substandard assets, but their collection in full is questionable on the basis of existing facts. The possibility of loss is present, but certain factors that may strengthen the asset defer its classification as a loss until a more exact status may be determined. Nonperforming assets that are at least 180 days past due are also classified as doubtful unless they are sufficiently secured.

Loss. Certain assets are considered uncollectible and of such little value that the continued definition as bankable assets is not warranted. This classification does not mean that an asset has absolutely no recovery or salvage value but rather that it is neither practical nor desirable to defer the process of writing it off, even though partial recovery may be possible in the future. Nonperforming assets that are at least one year past due are also classified as losses unless such assets are very well secured.

Primary emphasis in asset classification is placed on the client's ability and willingness to meet obligations out of prospective operating cash flow. Some jurisdictions require that all credit extended to an individual client should be assigned the same risk classification, while differences in classification should be noted and justified. Other jurisdictions recommend that each asset be assessed on its own merits. In cases where assets may be classified differently depending on whether subjective or objective criteria are used, the more severe classification should generally apply. If supervisory authorities, and in many cases external auditors, assign more stringent classifications than the bank itself, the bank is expected to adjust the classification.

In some advanced banking systems, banks use more than one rating level for assets in the category of standard or pass. The objective of this practice is to improve the ability to differentiate among different types of credit and

to improve the understanding of the relationship between profitability and rating level.

Nonperforming Loans

Nonperforming assets are those not generating income. As a first step, loans are often considered to be nonperforming when principal or interest on them is due and left unpaid for a specified period—often 90 days or more. (This period may vary by jurisdiction.) Loan classification and provisioning entails much more than simply looking at amounts overdue. The borrower's cash flow and overall ability to repay amounts owing are significantly more important than whether the loan is overdue.

When assessed within the context of nonperforming loans, the aggregate level of provisions indicates the capacity of a bank to effectively accommodate credit risk. The analysis of a nonperforming loan portfolio should cover the following aspects:

- *Aging of past-due loans*—including principal and interest and classified by more than 30, 90, 180, and 360 days—should be broken down by type of customer and branch of economic activity to determine overall trends and whether all customers are affected equally.
- *Reasons for the deterioration of loan portfolio quality* should be determined, which can help identify possible measures the bank can undertake to reverse a given trend.
- *Case-by-case assessment of a list of nonperforming loans,* including all relevant details, should be performed to determine whether the situation is reversible, exactly what can be done to improve repayment capacity, and whether workout or collection plans have been used.
- *Provision levels* should be considered to determine the bank's capacity to withstand loan defaults. The impact on profit and loss accounts should be considered to determine exactly how the bank will be affected by the deterioration of asset quality.

7.5 Loan Loss Provisioning

Asset classification provides a basis for determining an adequate level of provisions for possible loan losses. Such provisions, together with general loss reserves that are normally counted as Tier 2 capital and are not assigned to specific assets, form the basis for establishing a bank's capacity to absorb losses. In determining

an adequate reserve, all significant factors that affect the collectibility of the loan portfolio should be considered. These factors include the quality of credit policies and procedures, prior loss experiences, loan growth, quality of management in the lending area, loan collection and recovery practices, changes in national and local economic and business conditions, and general economic trends.

Calculation of Expected Loss

The expected loss calculation (figure 7.4) takes the following into consideration:

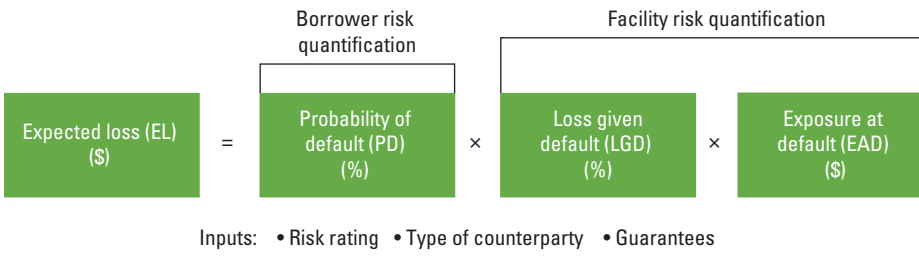
- *The risk inherent in the borrower:* the *probability* of default, considering *whom* the bank lent to
- *The risk inherent in the credit product:* the *loss* given a default, considering *what* product has been lent
- *The time elapsed since the loan was initiated:* the *exposure* at default, considering *how long* the client has been repaying.

Box 7.2 defines the risk measures used in the formula for determining expected credit losses (figure 7.4), and a practical example follows, applying the formula and the definitions (table 7.2).

IFRS 9 Implications

In addition, starting with financial years beginning January 1, 2018, IFRS 9 has moved accounting standards closer to sound credit risk management practices by abandoning the so-called incurred loss model of International Accounting Standard 39 (IAS) in favor of an expected loss model.

Figure 7.4 Expected Loss Calculation



Note: For the definitions of EL, PD, LGD, and EAD, see box 7.2.

BOX 7.2 Risk Measures, Defined

Credit risk is calculated using the following risk measures:

- *Probability of default (PD):* the percentage risk that an obligor, or borrower, will fail to make full and timely payment on its financial obligations over a given time horizon. PD is calculated for each client who has a loan or for a portfolio of clients with similar attributes. It is based on past observations of customers with similar risk profiles. PDs may be calculated by using
  - Historical databases of actual defaults
  - Estimates from the observable degradation of prices of credit default swaps, bonds, and options on common stock and other tangible security
  - Data from external ratings agencies for estimating PDs from historical default experience
  - Credit scorecards.
- *Loss given default (LGD):* The percentage risk that a loss would be incurred if there is a default event. It is observed based on past recoveries of similar events.
- *Exposure at default (EAD):* An estimation, in the financial statement currency, of the extent to which a bank may be exposed to a counterparty in the event of, and at the time of, that counterparty's default, given that a credit line may not be fully drawn down at a given point.
- *Expected loss (EL):* The amount, in the financial statement currency, that the bank is exposed to from any counterparty and is expected to lose once the customer defaults. The EL calculation is the basis for performing the book provisions.
- *Unexpected loss (UL):* The losses incurred, in the financial statement currency, under a high-stress scenario. It is typically identified as a point in the tail of a credit loss distribution (for example, at the 99th percentile).

Table 7.2 Application of the Expected Loss Formula: EL = PD × EAD × LGD

Portfolio	Rating	Loan amount ($)	Who? PD (midpoint) (%)	How long? EAD ($)	What product? LGD (%)	EL ($)
A	AAA	100,000	0.04	60,000	35	8.40
B	B+	100,000	3.53	80,000	45	1,270.80
C	D (defaulted)	100,000	100.00	100,000	100	100,000.00

Note: EAD = exposure at default; EL = expected loss; LGD = loss given default; PD = probability of default. For the definitions of these terms, see box 7.2.

IFRS 9 requires that expected losses be divided into three stages (table 7.3):

- *Stage 1:* All performing assets (not in arrears) should carry provisions calculated on a 12-month expected loss methodology including effective interest on the gross amount.
- *Stage 2:* Assets in arrears, or where a significant change in the credit environment has occurred—for example, where the underwriting decision for existing credit to a client would have been significantly different regarding price or other terms, given changes that have taken place in the macro economy (such as higher interest rates affecting a client's ability to service its debt)—carry provisions based on the lifetime expected losses for the asset while still including effective interest on the gross amount.
- *Stage 3:* Nonperforming assets carry provisions based on the lifetime expected losses for the asset while still including effective interest on the net (carrying) amount.

Table 7.3 Three Stages of Expected-Loss Recognition under IFRS 9

Recognition type	Stage 1	Stage 2	Stage 3
Recognition of impairment	12-month expected credit loss	Lifetime expected credit loss	
Recognition of interest	Effective interest on the gross amount		Effective interest on the net (carrying) amount

Note: IFRS = International Financial Reporting Standards. IFRS 9 is the standard pertaining to financial instruments, applying an expected loss model.

Workout Procedures for Loss Assets

Two approaches exist for dealing with loss assets. One is to retain loss assets on the books until all remedies for collection have been exhausted. This is typical for banking systems based on the British tradition; in such cases, the level of loss reserve may appear unusually large. The second approach requires that all loss assets be promptly written off against the reserve—that is, removed from the books. This approach is typical of the U.S. tradition and is more conservative; loss assets are considered to be nonbankable but not necessarily nonrecoverable. By immediately writing off loss assets, the level of the reserve will appear smaller in relation to the outstanding loan portfolio.

In evaluating the level of provisions established by a bank, an analyst must clearly understand whether the bank is aggressively writing off its losses or is simply providing for them. The approach used in a particular

country often depends on the taxation applied to provisions by the fiscal authorities.

Workout procedures are an important aspect of credit risk management. If timely action is not taken to address problem loans, opportunities to strengthen or collect on these poor-quality assets may be missed, and losses may accumulate to a point where they threaten a bank's solvency. An assessment of workout procedures should consider the organization of this function (including departments and responsible staff) and the performance of the workout units by reviewing attempted and successful recoveries (in terms of both number and volume) and the average time for recovery. The workout methods used and the involvement of senior management should also be evaluated.

During a workout process, each loan and borrower should be considered on their own merits. Typical workout strategies include the following:

- *Reducing the bank's credit risk exposure*—for example, by having the borrower provide additional capital, funds, collateral, or guarantees
- *Working with the borrower to assess problems and find solutions* to increase loan service and repayment capacity, such as the providing advice, developing a program to reduce operating costs and increase earnings, selling assets, designing a debt restructuring program, or changing loan terms
- *Arranging for a borrower to be bought or taken over* by a more creditworthy party or arranging for some form of joint-venture partnership
- *Liquidating exposure through out-of-court settlement or other legal action*, calling on guarantees, foreclosing, or liquidating collateral.

7.6 Analyzing Credit Risk

The detailed composition of assets usually provides a good picture of a bank's business profile and business priorities as well as the type of intermediation risk that the bank is expected and willing to take. Any analysis should include an overview of *what* products have been lent, to *whom*, and for *how long*.

An aggregate loan portfolio analysis should include the following:

- *Summary of the major loan types,* including details of the number of customers, average maturity, and the average interest rate earned

- *Distribution of the loan portfolio,* including various perspectives on the number of loans and total amounts—for example, according to currency, short-term (less than one year) and long-term (more than one year) maturities, industrial and other pertinent economic sectors, state-owned and private borrowers, and corporate and retail lending
- *Loans with government or other guarantees*
- *Review of loans by risk classification*
- *Analysis of nonperforming loans,* with specific reference to the loss experience per vintage (that is, measuring the loan losses per period granted, to determine whether disciplines for granting credit are being maintained).

To illustrate this process, figure 7.5 shows the profile of a bank's borrowers, including individuals and public sector and other enterprises. This profile highlights the target customer segments that pose an acceptable risk to a bank. The figure also traces the shift of target customer profiles from public sector enterprises toward the private sector.

Figure 7.5 Customer Profile: *To Whom* Are We Lending?

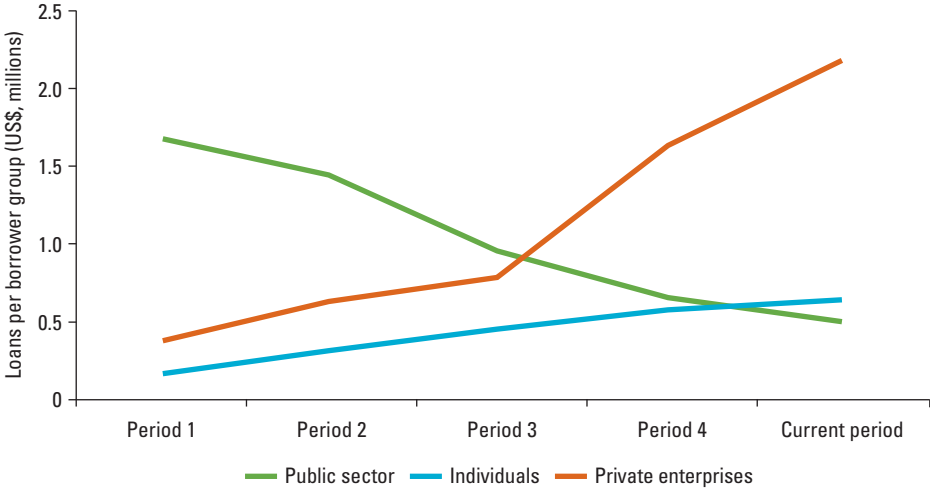


Figure 7.6 illustrates the various products that a bank can lend out in response to market demand. Changes in a bank's target customers clearly affect the distribution of its lending products.

Figure 7.6 Loan Distribution Profile: *What* Products Are We Lending?

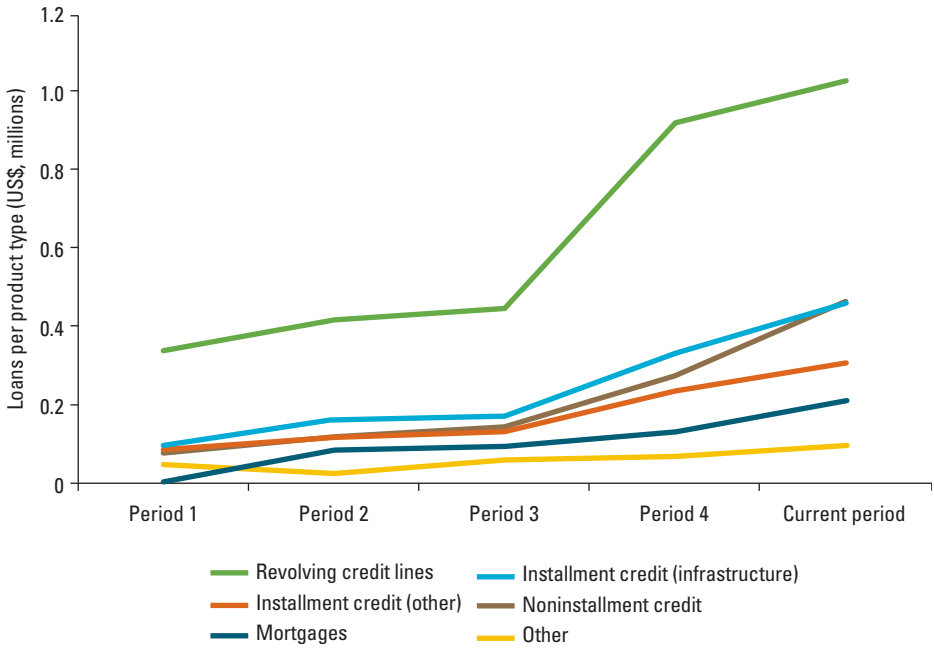
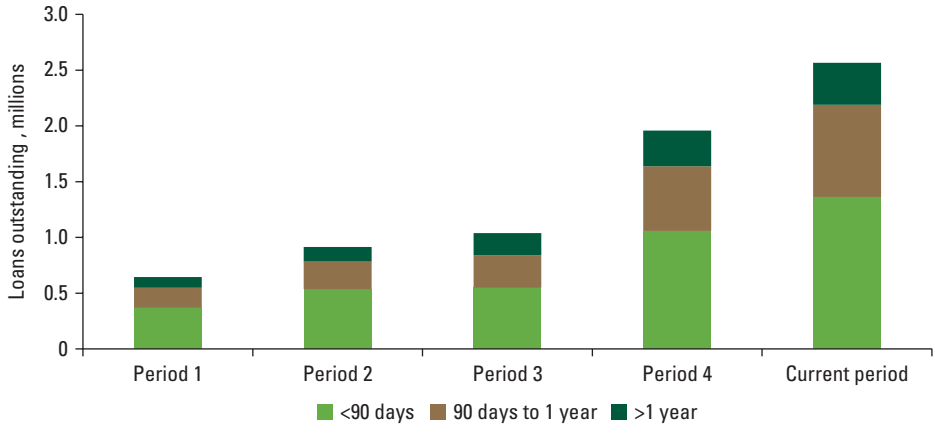


Figure 7.7 traces the evolution of the maturity structure (or length) of a bank's loans to customers. Changes in maturity structure may be influenced by shifts in customers and lending products as well as by a bank's risk factors or macroeconomic trends.

Figure 7.7 Loan Maturity Profile: *How Long* Are We Lending For?



7.7 Assessing Credit Risk Management Capacity

When carrying out its duties on behalf of both depositors and shareholders, a board of directors must ensure that a bank's lending function fulfills three fundamental objectives:

- Loans should be granted on a sound and collectible basis.
- Funds should be invested profitably for the benefit of shareholders and the protection of depositors.
- The legitimate credit needs of economic agents and households should be satisfied.

The purpose of a risk management capacity review is to evaluate whether (a) the lending process is well organized (including whether policies are properly described in internal procedures and manuals); (b) the staffing is adequate and diligent in following established policies and guidelines; and (c) the information normally available to participants in the lending process is timely, accurate, and complete.

Lending process. The integrity and credibility of the lending process depend on objective credit decisions that ensure an acceptable risk level in relation to the expected return. A review of the lending process should include analysis of credit manuals and other written guidelines applied by various bank departments and of the capacity and actual performance of all departments involved in the credit function. It should also cover the origination, appraisal, approval, disbursement, monitoring, collection, and handling procedures for the various credit functions provided by the bank. Specifically, the review should cover the following:

- *A detailed credit analysis and approval process,* including samples of loan application forms, internal credit summary forms, internal credit manuals, and loan files
- *Criteria for approving loans,* determining loan pricing policy and lending limits at various levels of the bank's management, and arranging lending through the branch network
- *Collateral policy for all types of loans,* including the actual methods and practices concerning revaluation of collateral and files related to collateral

- *Administration and monitoring procedures,* including responsibilities, compliance, and controls
- *A process for handling exceptions.*

The review should involve interviews with all middle-level managers of all departments that have a credit function. It should also include reviews of individual credit files. A review of the volume of the credit applications that have been appraised versus those that have been approved in the past 6 or 12 months (in terms of both total numbers and dollar amounts) would be one indication of the quality of credit appraisal.

Staffing. This assessment should identify the staff involved in credit origination, appraisal, supervision, and processes to monitor credit risk. Specifically, their number, levels, age, experience, and specific responsibilities should be identified. Staff organization, skills, and qualifications should be analyzed in relation to policies and procedures. All ongoing training programs for a bank's credit staff should be reviewed and their adequacy assessed. The quality and frequency of staff training is usually a good indicator of the level of lending skills.

Information flows. Because the lending function is usually spread throughout an organization, a bank must have efficient systems for monitoring adherence to established guidelines. This can best be accomplished through an internal review and reporting system that informs the directorate and senior management of how policies are being carried out and gives them enough information to evaluate the performance of lower-echelon officers and the condition of the loan portfolio.

Because information is the basic element of the credit management process, its availability, quality, and cost-effectiveness should be analyzed. In addition, because information needed in the credit management process may be dispersed in different parts of the bank, an analysis should pay particular attention to information flows, especially whether the information supplied is complete and available in a timely and cost-effective manner. Such an analysis should be closely linked to a review of human resources, organizational and control structures, and information technology.

Finally, the board of directors should ensure a solid understanding of how credit risk is managed (box 7.3). In most major banks, this responsibility is delegated to a risk committee.

BOX 7.3 Credit Risk Management Questions a Board of Directors Should Ask

- Are our loans and deposits priced competitively?
- How diversified were our sources of interest income?
- Is our income from the loan portfolio secure? What is the level of security?
- Are our investment returns indicative of the risk taken?
- Is our liquidity profile sustainable in stress scenarios?
- What internal rating models does the bank use?
- How accurate have our PD, LGD, and EAD estimates been?
- What is our attitude toward problematic loans?
- How frequently do we stress-test the portfolio?
- Are all concentration risks disclosed?
- Do we have the required information?
  - Total portfolio exposure and trends
  - Analysis by internal and external ratings, product type, other relevant factors
  - Concentration and trends
  - Potential losses (provisioning)
  - Limits and breaches: utilizations
  - Profitability versus budget
  - Impairment charge
  - Arrears and trends
  - Stress test results
  - Selected KRIs
  - Any other information that management wishes to bring to the board's attention

Note: EAD = exposure at default; KRIs = key risk indicators; LGD = loss given default; PD = probability of default.

Note

1. IFRS 9 ("Financial Instruments") became effective in 2018, replacing International Accounting Standard 39 (IAS 39). For more information, see "About IFRS 9 Financial Instruments," IFRS website: https://www.ifrs.org/issued-standards/list-of-standards/ifrs-9-financial-instruments/#about.

8

Liquidity Risk Management

KEY MESSAGES

- Liquidity risk is the risk of a bank's inability to meet its payment obligations as liabilities fall due.
- Liquidity management is a key banking function and an integral part of the asset-liability management process.
- Banks are particularly vulnerable to liquidity problems on an institution-specific level and from a systemic or market viewpoint, as follows:
  - *Funding liquidity risk* relates to a bank's inability to efficiently meet current and future cash flow and collateral requirements (expected and unexpected) without affecting its reputation, daily operations, or financial position.
  - *Market liquidity risk* relates to inability or difficulty in offsetting or eliminating a position without significantly affecting market prices, because of inadequate market depth or market disruptions.
- The sources of deposits (that is, who provides the bank's funding and for how long) adds to the volatility of funds, because some creditors are more sensitive than others to market and credit events. Diversification of funding sources and maturities enables a bank to avoid the vulnerability associated with the concentration of funding from a single source.
- Liquidity management policies should comprise a risk management (decision-making) structure, a liquidity management and funding strategy, a set of limits to liquidity risk exposures, and a set of procedures for liquidity planning under alternative scenarios, including crisis situations.

8.1 The Need for Liquidity

Liquidity is necessary for banks to compensate for expected and unexpected balance sheet fluctuations and to provide funds for growth. It represents a bank's ability to efficiently accommodate the redemption of deposits and other liabilities and to cover funding increases in the loan and investment portfolio. A bank has adequate liquidity potential when it can

obtain needed funds (by increasing liabilities, securitizing, or selling assets) promptly and at a reasonable cost. The price of liquidity is a function of market conditions and the market's perception of the inherent riskiness of the borrowing institution.

In September 2008, the Basel Committee on Banking Supervision (BCBS) issued its *Principles for Sound Liquidity Risk Management and Supervision* (BCBS 2008), summarized in box 8.1. By January 2019, the BCBS announced that it had completed a review of these principles and that the review confirmed that the principles remained fit for purpose but noted that guidance had been significantly expanded in key areas:

- The importance of establishing a liquidity risk tolerance
- The maintenance of adequate liquidity, including through a cushion of liquid assets
- The necessity of allocating liquidity costs, benefits, and risks to all significant business activities
- The identification and measurement of the full range of liquidity risks, including contingent liquidity risks
- The design and use of severe stress test scenarios
- The need for a robust and operational contingency funding plan
- The management of intraday liquidity risk and collateral
- Public disclosure in promoting market discipline.

The BCBS also augmented the guidance for supervisors substantially—emphasizing the importance of supervisory assessment of the adequacy of a bank's liquidity risk management framework and its level of liquidity—and stressed the importance of effective cooperation between supervisors and other key stakeholders, such as central banks, especially in times of stress.

In practice, liquidity risk management relies on

- Establishment of effective liquidity risk management policies and risk tolerance
- Effectiveness of board and senior management oversight
- Use of appropriate liquidity risk management tools such as forecasting, setting liquidity risk limits, and regular stress testing
- Introduction of robust, multifaceted contingency plans
- Maintenance of a sufficient cushion of high-quality liquid assets.

BOX 8.1 Summary of BCBS Principles for Sound Liquidity Risk Management and Supervision

The Fundamental Principle

Principle 1: Banks should have robust liquidity risk management frameworks in place.

Governance of Liquidity Risk Management

Principle 2: Banks should clearly articulate their liquidity risk tolerance.

Principle 3: Senior management should develop strategies, policies, and practices to manage liquidity risk within the risk tolerance levels. Senior management should report regularly to the board on these matters, and the board should review the strategies, policies, and practices at least annually to ensure that liquidity risk is managed effectively.

Principle 4: Banks should align risk-taking incentives with liquidity risk exposures by incorporating liquidity risks, costs, and benefits in an effective internal pricing mechanism, performance measurements, and new-product approval processes.

Measurement and Management of Liquidity Risk

Principle 5: Banks should have sound processes in place to identify, measure, monitor, and control liquidity risk.

Principle 6: Liquidity risk should be actively identified, measured, monitored, and controlled across legal entities, business lines, and currencies, considering any limitations on the transferability of liquidity.

Principle 7: Banks should implement strategies to effectively diversify their funding sources.

Principle 8: Banks should manage intraday liquidity positions and risks effectively to ensure that the payment and settlement obligations are met in a timely fashion under both normal and stressed conditions.

Principle 9: Banks should actively manage their collateral positions.

Principle 10: Banks should conduct regular stress testing for bank-specific, marketwide, and combined scenarios to identify potential sources of liquidity risk and ensure that exposures remain within risk tolerance levels.

Principle 11: Banks should have contingency funding plans (CFPs) in place that specify the strategies to address liquidity shortfalls in emergency situations and

box continues next page

BOX 8.1 Summary of BCBS Principles for Sound Liquidity Risk Management and Supervision *(continued)*

to ensure that roles, responsibilities, escalation procedures, and communication procedures are clearly defined. CFPs should be regularly tested to ensure that they are operationally robust.

Principle 12: A liquidity buffer of high-quality, unencumbered liquid assets should be maintained against a range of stress scenarios.

Public Disclosure

Principle 13: Banks should issue regular public disclosures to enable market participants to make informed judgment on the soundness of a bank's liquidity risk position.

Role of Supervisors

Principle 14: Supervisors should regularly perform a comprehensive assessment of a bank's liquidity risk management frameworks and positions.

Principle 15: Supervisors should supplement their assessments by monitoring internal reports, prudential reports, and market information.

Principle 16: Supervisors should intervene if necessary to ensure that banks implement timely remedial action to address any deficiencies.

Principle 17: Supervisors should communicate with each other to facilitate effective cooperation regarding the supervision and oversight of liquidity risk.

Source: BCBS 2008.

Liquidity risk management lies at the heart of confidence in the banking system, because commercial banks are highly leveraged institutions. The importance of liquidity transcends the individual institution because a liquidity shortfall at a single institution can have systemwide repercussions. It is in the nature of a bank to transform the term of its liabilities to different maturities on the asset side of the balance sheet. Because the yield curve typically slopes upward, the maturity of assets tends to be longer than that of liabilities. The inflow and outflow of funds do not necessarily reflect contractual maturities, and yet banks must be able to meet certain commitments (such as deposit withdrawals) whenever they come due. A bank may therefore experience liquidity

mismatches, making its liquidity policies and liquidity risk management key factors in its business strategy.

Banks typically focus their liquidity risk management on market liquidity rather than statutory liquidity. The implication of liquidity risk is that a bank may have insufficient funds on hand to meet its obligations. (A bank's net funding includes its existing liabilities, marketable assets, and standby facilities with other institutions. It would sell its marketable assets in the liquidity portfolio [see chapter 9] to meet liquidity requirements only as a last resort.) Liquidity risks are normally managed by a bank's asset-liability management committee (ALCO), which must therefore have a thorough understanding of the interrelationship between liquidity and other market and credit risk exposures on the balance sheet.

This chapter focuses on the management of expected cash flows. Understanding the context of liquidity risk management involves examining a bank's approach to funding and liquidity planning under alternative scenarios. As a result of the increasing depth of interbank (money) markets, a fundamental shift has taken place in the authorities' attitude toward prudent liquidity management. Supervisory authorities now tend to concentrate on the maturity structure of a bank's assets and liabilities rather than solely on its statutory liquid asset requirements. They do this using maturity ladders for liabilities and assets during specific periods (or time bands), a process that represents a move from the calculation of contractual cash outflows to the calculation of expected liquidity flows.

8.2 Liquidity Risk Management Approaches

In day-to-day operations, liquidity management is typically achieved through the management of a bank's assets. In the medium term, liquidity is also addressed by managing the structure of a bank's liabilities. The level of liquidity deemed adequate for one bank may be insufficient for another because of the differences in funding and maturity structures. A particular bank's liquidity position may also vary between adequate and inadequate according to the anticipated need for funds at any given time. Judgment of the adequacy of a liquidity position requires analysis of a bank's historical funding requirements, its current liquidity position and anticipated future funding needs, its options for reducing funding needs or attracting additional funds, and its sources of funding.

The amount of liquid or readily marketable assets that a bank should hold depends on the stability of its deposit structure and the potential for rapid loan

portfolio expansion. Generally, if deposits are composed primarily of small, stable accounts, a bank will need relatively low liquidity. A much higher liquidity position normally is required when a substantial portion of the loan portfolio consists of large, long-term loans; when a bank has a somewhat high concentration of deposits; or when recent trends show reductions of large corporate or household deposit accounts. Situations also can arise in which a bank should increase its liquidity position—for example, when large commitments have been made on the asset side and the bank expects the client to start utilization.

Liquidity Management Policies

A bank's liquidity management policies normally comprise a decision-making structure; an approach to funding and liquidity operations; a set of limits to liquidity risk exposure; and a set of procedures for liquidity planning under alternative scenarios, including crisis situations (table 8.1). The decision-making structure reflects the importance that management places on liquidity: banks that stress the importance of liquidity normally institutionalize the structure for liquidity risk management in the ALCO and assign ultimate responsibility

Table 8.1 Liquidity Risk Management Approaches

Structural liquidity risk	Daily liquidity risk	Contingency liquidity risk
Managing the risk that structural, long-term, on- and off-balance-sheet exposure cannot be funded in a timely manner or at reasonable cost	Ensuring that intraday and day-to-day anticipated and unforeseen payment obligations can be met by maintaining a sustainable balance between liquidity inflows and outflows	Maintaining a number of contingency funding sources to draw upon in times of economic stress
• Setting liquidity risk tolerance • Setting liquidity strategy • Ensuring substantial diversification of funding sources • Assessing the impact of future funding and liquidity shortfalls or excesses • Setting the approach to liquidity management in different currencies and countries • Ensuring adequate liquidity ratios • Ensuring an appropriate structural liquidity gap • Maintaining a funds transfer pricing methodology and process	• Managing intraday liquidity positions • Managing the daily payment queue • Monitoring net funding requirements • Forecasting cash flows • Performing short-term cash flow analysis for all currencies (individually and in aggregate) • Managing intragroup liquidity • Managing central bank clearing • Managing net daily cash positions • Managing and maintaining market access • Managing and maintaining collateral	• Managing early warning and key risk indicators • Performing stress testing, including sensitivity analyses and scenario testing • Maintaining product behavior and optionality assumptions • Ensuring that an adequate and diversified portfolio of liquid assets and buffers are in place • Maintaining the contingency funding plan

Source: FirstRand Bank Pillar 3 disclosures, 2018.

for setting policy and reviewing liquidity decisions to the bank's highest management level. The bank's strategy for funding and liquidity operations, which should be approved by the board, sets specific policies on particular aspects of risk management, such as the target liabilities structure, the use of certain financial instruments, or the pricing of deposits.

Liquidity needs usually are determined by the construction of a maturity ladder (as discussed in section 8.7) that comprises expected cash inflows and outflows over a series of specified time bands. The difference between the inflows and outflows in each period (that is, the excess or deficit of funds) provides a starting point from which to measure a bank's future liquidity excess or shortfall at any given time.

Once its liquidity needs have been determined, a bank must decide how to fulfill them. Liquidity management is related to a net funding requirement. In principle, a bank may increase its liquidity through asset management, liability management, or (most frequently) a combination of both. In practice, a bank may meet its liquidity needs by disposing of highly liquid trading portfolio assets or assets that are nearly liquid, or by selling less-liquid assets such as excess property or other investments. On the liabilities side, this can be achieved by increasing short-term borrowings and short-term deposit liabilities, by increasing the maturity of liabilities, and ultimately by increasing capital.

Many banks, particularly smaller ones, tend to have little influence over the total size of their liabilities. Their liquid assets enable such banks to provide funds to accommodate fluctuations in deposit levels and to satisfy increases in loan demand. Banks that rely solely on asset management to maintain liquidity in the face of shifts in customer asset and liability preferences concentrate on adjusting the price and availability of credit and the level of liquid assets that they hold.

Asset liquidity—or how "salable" the bank's assets are in terms of both time and cost—is central to asset-liability management. To maximize profitability, bank management must weigh the full return on liquid assets (yield plus insurance value) against the higher return associated with less-liquid assets. In most cases, liquid assets normally are maintained only as a liquidity buffer that banks can use should they encounter funding problems and depositors have to be refunded. Banks otherwise prefer to invest in assets with higher yields. Income derived from higher-yield assets nonetheless may be offset by a forced sale, which may in turn become necessary as a result of adverse balance sheet fluctuations.

The number of banks that rely solely on manipulation of the asset structure to meet liquidity needs is declining rapidly as the interbank (money) markets develop. Seasonal, cyclical, or other factors often can cause aggregate outstanding loans and deposits to move in opposite directions, resulting in a loan demand that exceeds available deposit funds. A bank that relies on asset management should restrict loan growth to a level that can be supported by available deposit funds. As an alternative, liquidity needs may be met through liability sources such as money markets.

Another challenge for liquidity management concerns contingent liabilities such as letters of credit or financial guarantees. These represent potentially significant cash outflows that are not dependent on a bank's financial condition.

Although outflows in normal circumstances typically may be low, a general macroeconomic or market crisis can trigger a substantial increase in cash outflows because of the increase in defaults and bankruptcies in the enterprise sector that normally accompanies such events. Low levels of market liquidity, further exacerbating funding shortfalls, often accompany banking crises.

Foreign Currency Aspects

The existence of multiple currencies also increases the complexity of liquidity management, particularly when the domestic currency is not freely convertible. A bank may have difficulty raising funds or selling assets in foreign currencies in the event of market disturbances or changes in domestic monetary or foreign exchange policies.

In principle, a bank should have a management system (that is, measuring, monitoring, and control) for its liquidity positions in all major currencies in which it is active. In addition to assessing its aggregate liquidity needs, a bank should perform a separate analysis of its liquidity strategy for each currency. The key aspect of managing liquidity in individual foreign currencies is the management structure: who is responsible for liquidity and liquidity risk in each currency, and within what parameters.

A bank that operates in foreign currencies but does not maintain branch offices abroad usually manages liquidity of foreign currencies at its headquarters. A typical scheme for a bank with offices abroad is that policy setting and overall coordination and supervision are kept at headquarters, but the responsibility for the bank's liquidity in a major foreign currency is delegated to the branch office in the country issuing that currency.

The liquidity strategy for each currency, or exactly how its foreign currency funding needs will be met, should be a central concern of the bank. The bank must also develop a backup liquidity strategy for circumstances in which its usual approach to liquidity funding is disrupted. Depending on the size of its foreign exchange operations and its portfolio in each currency, the bank may define a backup liquidity strategy for all currencies or may draw up a separate contingency plan for each one.

8.3 The Regulatory Environment

Banking legislation normally contains specific liquidity requirements that banks must meet. These prudential requirements should not be viewed as the primary method for managing liquidity risk. On the contrary, given the importance of liquidity, a bank with prudent management should establish specific policy guidelines for liquidity risk management in addition to determining responsibility for planning and day-to-day fund management.

The most significant development in prudential liquidity regulation in the past two decades has been the assessment of liquidity needs by calculating expected cash flows, based on the maturity structure of a bank's assets and liabilities, through the introduction of a liquidity coverage ratio (LCR) for short-term resilience and a net stable funding ratio (NSFR) for the longer term.

Liquidity Coverage Ratio (LCR)

The objective of the LCR is to promote the short-term resilience of banks' liquidity risk profiles. It does this by ensuring that banks have an adequate stock of unencumbered high-quality liquid assets (HQLA) that can be converted easily and immediately in private markets into cash to meet their liquidity needs for a 30-calendar-day liquidity stress scenario, as summarized in the following formula (BCBS 2013):

$$\frac{\text{Stock of HQLA}}{\text{Total net cash outflows over the next 30 days}} \geq 100\%.$$

The LCR standard (as defined by the BCBS) identifies the amount of unencumbered HQLA that an institution should hold to be able to fund the net cash outflows it would encounter under an acute short-term (30-day) stress scenario, as specified by supervisory authorities. The LCR will improve the banking sector's ability to absorb shocks arising from financial and economic

stress, whatever the source, thus reducing the risk of spillover from the financial sector to the real economy.

The BCBS document setting forth the LCR standard that the ratio must be no lower than 100 percent also sets timelines for its implementation. Banks that are below the 100 percent required minimum thresholds can meet these standards by, for example, lengthening the term of their funding or restructuring business models that are most vulnerable to liquidity risk in periods of stress.

The 30-day stress scenario, an effort to avoid both institution-specific and systemic shock, built upon experiences during the global financial crisis. It seeks to prevent several possible consequences of insufficient HQLA:

- Downgrade of the institution's public credit rating
- Partial loss of deposits
- Loss of unsecured wholesale funding
- Significant increase in secured funding haircuts
- Increases in derivative collateral calls and substantial calls on contractual and noncontractual off-balance-sheet exposures, including committed credit and liquidity facilities.

It is important to note that the LCR standard establishes a *minimum* level of liquidity for internationally active banks. Banks are expected to meet this standard as well as adhere to the more expansive Basel III capital standards described in chapter 6.

Net Stable Funding Ratio (NSFR)

The objective of the NSFR is to promote liquidity resiliency over longer-term horizons by creating additional incentives for banks to fund their activities with more stable, ongoing sources of funding. The NSFR relates the bank's available stable funding (ASF) to its required stable funding (RSF), as summarized in this formula:

$$\frac{\text{Total ASF}}{\text{Total RSF}} \geq 100\%.$$

The NSFR measures the amount of longer-term, stable sources of funding relative to the liquidity profiles of the assets funded and potential calls on funding arising from off-balance-sheet commitments and obligations. (For more about determination of the ASF and RSF, see box 8.2.)

BOX 8.2 Determination of Factors for NSFR Calculation

To determine total ASF and RSF amounts for the calculation of the net stable funding ratio (NSFR), factors reflecting supervisory assumptions are assigned to the bank's sources of funding and to its exposures, with these factors reflecting the liquidity characteristics of each category of instruments.

Available Stable Funding (ASF)

A bank's total ASF is the portion of its capital and liabilities that will remain with the institution for more than one year. The broad characteristics of an institution's funding sources and their assumed degree of stability are the basis for determining ASF.

An ASF factor is assigned to the carrying value of each element of funding. ASF factors range from 100 percent (meaning the funding is expected to remain fully available in more than a year) to 0 percent (reflecting unreliable funding from this source). The three other ASF factors are 95 percent (which applies, for instance, to well-divided retail deposits); 90 percent; and 50 percent. The total amount of ASF is the sum of the ASF amounts for each category of liability.

Required Stable Funding (RSF)

A bank's total RSF is the amount of stable funding that it is required to hold given the liquidity characteristics and residual maturities of its assets and the contingent liquidity risk arising from its off-balance-sheet exposures.

For each item, the RSF amount is determined by assigning an RSF factor to the carrying value of the exposure. These range from 100 percent to 0 percent. An RSF factor of 100 percent means that the asset or exposure needs to be entirely financed by stable funding because it is illiquid. This is, for instance, the case for all loans to financial institutions with a residual maturity of 12 months or more. An RSF factor of 0 percent applies to fully liquid and unencumbered assets. The other RSF factors are 85 percent, 65 percent, 50 percent, 15 percent, 10 percent, and 5 percent. The total RSF amount is the sum of the RSF for each category.

Specific Treatments

Although the NSFR treats liabilities and equity instruments and assets separately, some transactions warrant specific treatments. Off-balance-sheet exposures

box continues next page

BOX 8.2 Determination of Factors for NSFR Calculation *(continued)*

generally receive an RSF factor of 5 percent, but specific factors may be determined at national discretion for certain products or certain noncontractual obligations.

Special treatments also apply to transactions involving interdependent assets and liabilities when these involve little or no maturity transformation. This is typically the case with offsetting trades conducted by banks as part of their activities as market intermediaries. Moreover, derivatives transactions are also subject to particular treatments. Subject to conditions, these allow for bilateral netting and take account of variation margins.

Source: FSI 2018.

The NSFR proposals were first introduced in 2009 and recalibrated in 2014 to require banks to maintain a stable funding profile in relation to their on- and off-balance-sheet activities, thus reducing the likelihood that disruptions to a bank's regular sources of funding will erode its liquidity position in a way that could increase the risk of its failure and potentially lead to broader systemic stress (BCBS 2014). The NSFR does this by limiting the use of volatile short-term borrowings to fund illiquid assets. The final NSFR version was published in 2017 as part of the Basel III framework and became an international standard requirement in 2018.

The approach to bank supervision is therefore increasingly focused on the independent evaluation of a bank's strategies, policies, and procedures as well as its practices related to the measurement, monitoring, and control of liquidity risk. The emphasis increasingly is on the management structures necessary to effectively execute a bank's liquidity strategy and on the involvement of senior management in the liquidity risk management process.

8.4 The Structure of Funding

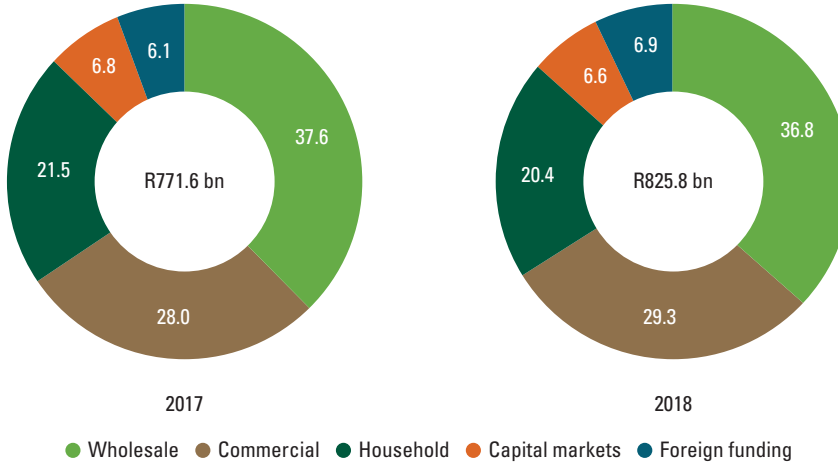
Funding structure is a key aspect of liquidity management. A bank with a stable, large, and diverse deposit base is likely to have fewer liquidity problems than a bank lacking such a deposit base. The assessment of the structure and type of deposit base and evaluation of the condition (that is, the stability and quality) of the deposits thus is the starting point for liquidity risk assessment.

Assessment of Deposit Base

The type of information necessary to conduct this assessment includes the following (figure 8.1):

- *Product range.* The different types of deposit products available should be noted, along with the number of accounts and the balance raised for each. This information is best presented in a schedule that shows the product type, such as savings or checking account, six-month deposit, or deposit with maturity greater than six months. (Product types are defined according to a bank's own product offerings.) The nature of the depositor (for example, corporate or retail) should also be shown because each type of depositor has a certain behavioral pattern. Breakdowns by the terms of deposit (including currency, maturity, and interest rates) should also be included.
- *Deposit concentration.* The assessment should look at an itemization for all customers with deposits that aggregate to more than a certain percentage of total assets, with terms and pricing shown for each.
- *Deposit administration.* Information should be gathered on the adequacy of the systems that record and control depositor transactions and internal access to customer accounts, as well as on the calculation and form of payment of interest (for example, average daily or period-end balance).

Figure 8.1 Funding Structure by Instrument Type, Two-Year Comparison



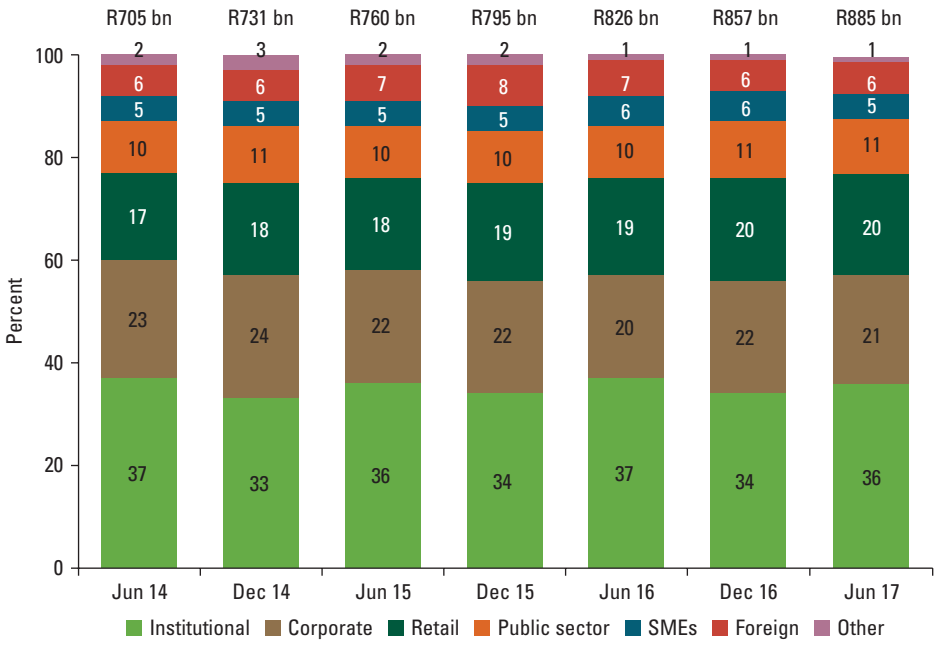
Source: Nedbank Limited Pillar 3 disclosures, 2018.

Note: bn = billions.

Because of the competition for funds, most corporations and individuals seek to minimize their idle funds and the effect of disintermediation on a bank's deposit base. A bank's management therefore typically will adopt a development and retention program for all types of deposits. In addition to deposit growth, management must look at the quality of the deposit structure to determine what percentage of the overall deposit structure is based on stable or hard-core deposits, fluctuating or seasonal deposits, and volatile deposits. This step is necessary if funds are to be invested with a proper understanding of anticipated and potential withdrawals.

Figure 8.1 illustrates the deposit instrument types and figure 8.2 the sources of funding (that is, from whom funding has been received, including corporations, public sector, and foreign branches). Deposit management is a function of a number of variables, some of which are not under the direct control of bank management.

Figure 8.2 Funding, by Source



Source: FirstRand Pillar 3 disclosures, 2017.

Note: The analysis shown in the figure excludes foreign branches. bn = billions; SMEs = small and medium enterprises.

Interbank Funding

Another key ingredient of a liquidity profile is a bank's ability to obtain additional liabilities (also known as its liquidity potential). The marginal cost of liquidity (that is, the cost of incremental funds acquired) is of paramount importance in evaluating the sources of liquidity. Consideration must be given to such factors as the frequency with which a bank needs to refinance maturing purchased liabilities and its ability to obtain funds through the money market. For a bank that operates frequently in short-term money markets, the crucial determinant of the ability to borrow new funds is its standing in the market.

The obvious difficulty of estimating the ability to borrow is that until a bank enters a market, the availability of funds at a price that will give a positive yield spread cannot be determined with certainty. Changes in money market conditions may cause a bank's capacity to borrow at a profitable rate to decline rapidly. In times of uncertainty, large investors and depositors tend to be reluctant to trade with small banks because they are regarded as risky. The same pattern may also apply to larger banks if their solvency comes into question.

8.5 Volatility of Funding and Concentration of Deposits

Another critical aspect of liquidity risk management is dependence on a single source of funding (also known as concentration risk). If a bank has a few large depositors and one or more withdraw their funds, enormous problems will occur if alternative sources of funding cannot quickly be found. Most banks therefore closely monitor their funding mix and the concentration of depositors to prevent excessive dependence on any particular source. Banks' sensitivity to large withdrawals in an uncertain environment cannot be overemphasized.

As mentioned, regulators are increasingly focusing on mismatches in liquidity flows and on banks' ability to fund such mismatches on an ongoing basis, rather than on statutory liquid assets and traditional access to the central bank. An appraisal of a bank therefore must give adequate attention to the mix between wholesale and retail funding and, in connection to this, the exposure to large depositors and whether an undue reliance on individual sources of funds exists.

Figure 8.3 Ten Largest Sources of Deposits as a Share of Total Deposits, by Type and Maturity Term

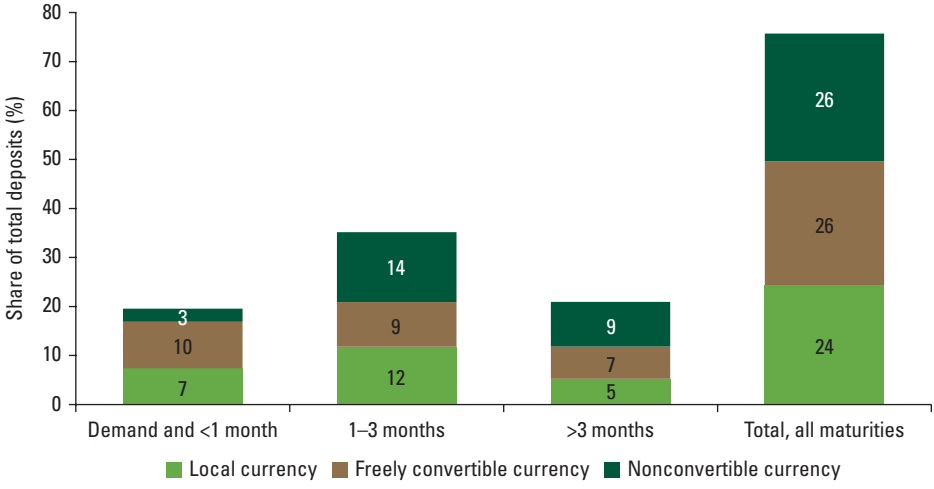


Figure 8.3 illustrates an assessment of concentration in the bank under observation. The aim of such an assessment is to establish whether the bank is exposed to a creditor large enough to cause a liquidity crisis if it were to withdraw its funding.

By calculating the percentage of the short-term mismatch that large deposits represent, an analyst can obtain a picture of the sensitivity of the bank or of the banking sector as a whole to withdrawals by large suppliers of funds. The proportion of wholesale funding to retail funding is another means of measuring sensitivity to large depositors. Overall, the increasing volatility of funding is indicative of the changes in the structure and sources of funding that the banking sector is undergoing.

To assess the general volatility of funding, a bank usually classifies its liabilities as those that are likely to stay with the bank under any circumstances—for example, enterprise transaction accounts—and those that can be expected to pull out if problems arise. The key issues to be determined for the latter are their price sensitivity, the rate at which they would pull out, and which liabilities could be expected to pull out at the first sign of trouble.

8.6 Cash Flow Analysis

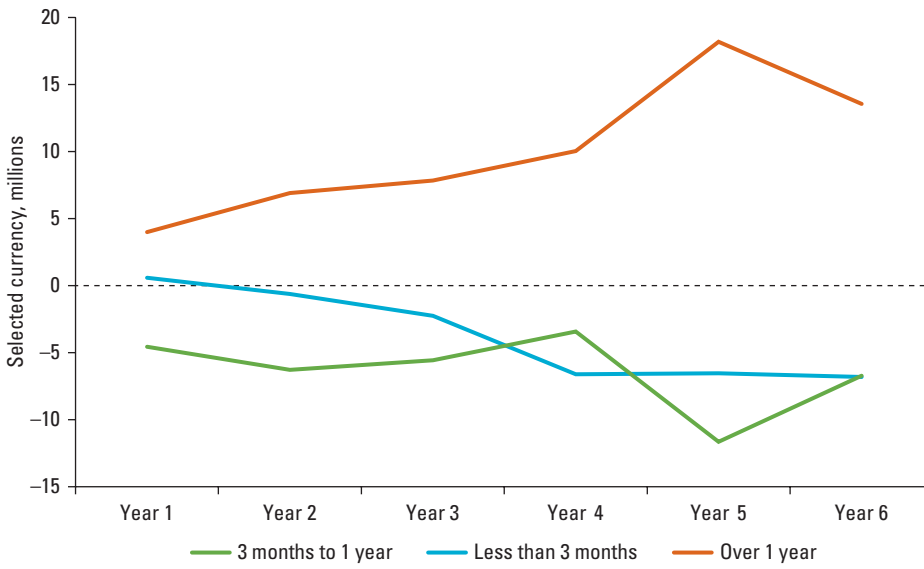
Maturity mismatches are an intrinsic feature of banking, including the short-term liability financing of medium-term and long-term lending. The crucial

question is not whether mismatching occurs—because it always does—but to what extent and whether this situation is reasonable or potentially unsound. Put another way, one can ask for how long, given its current maturity structure, a bank could survive if there is a funding crisis, and what amount of time would be available to act before the bank loses the capacity to meet its commitments. These questions should be asked by banks, regulators, and ultimately policy makers. This aspect of liquidity risk management also implies that access to the central bank, as the lender of last resort, should be available only to solvent banks that have temporary liquidity problems.

Figure 8.4 provides a view of a bank's maturity ladder. The trend toward a short-term mismatch is reviewed over time to determine whether the mismatches are increasing. An increased mismatch could be the result of problems in obtaining long-term funding for the bank or could reflect a deliberate decision based on the bank's view of future interest rate movements. For example, banks tend to increase their short-term mismatches if they expect interest rates to fall.

The focus of such an analysis is not only the size of the mismatch but also its trends over time, because these could indicate whether the bank has a potential funding problem.

Figure 8.4 Six-Year Trend of Liquidity Mismatches



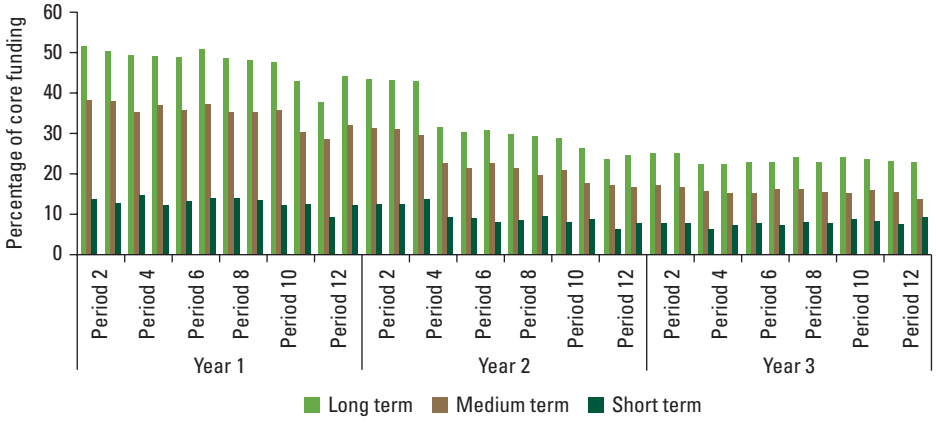
When reviewing the short-term mismatch as a percentage of total liabilities, an analyst will need to determine the proportion of the total funding that has to be renewed on a short-term basis.

Liquid assets actually held can then be compared with the value of the short-term mismatch to assess how much of the latter is in fact covered by a buffer stock of HQLA. In addition, other readily marketable securities should be considered.

The contractual maturity-term structure of deposits over time can be used to ascertain whether a funding structure is changing. If it is, the analyst should determine whether the bank is experiencing funding shortages or is deliberately changing its funding structure. Figure 8.5 illustrates a trend analysis of the maturity profile of the deposit base. This analysis can be used to evaluate whether a bank's policy change is permanent or erratic as well as to assess the regularity of funding problems (that is, the amount of funding that has to be renegotiated contractually on a short-term basis).

Although it is apparent that the maturity structure of deposits for the observed bank has changed, the reasons are not straightforward or easy to determine. For example, in volatile economies characterized by high inflation and in countries where the public lacks confidence in the banking system, the maturity of deposits tends to be much shorter than in stable economies. The worsening of the observed bank's economic environment could have triggered the shortening of maturities. At the same time, the bank's sources of deposits could have changed during the period, with individual household deposits as a percentage of total deposits increasing and private enterprise

Figure 8.5 Maturity Profile of a Bank's Deposit Base



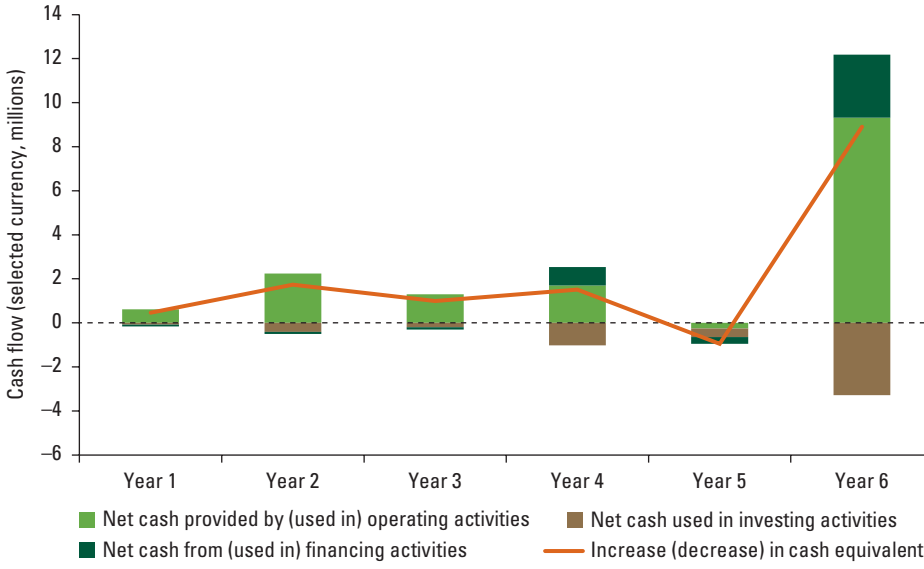
deposits decreasing. The change in average maturity could therefore be at least partly attributed to changes in funding sources.

Once the contractual mismatch has been calculated, it is important to determine the expected cash flow that can be produced by the bank's asset-liability management model. The cash flow statement in a bank's annual report can be useful in this regard (figure 8.6).

Neither the contractual nor the expected mismatch will be accurate, but both will indicate the amount of funding that a bank might be required to obtain from nonclient sources. The sources available to banks could include the central bank's liquidity support facilities (geared toward liquid assets held by the individual banks) and money market funding. The amount remaining for the use of central bank facilities indicates the size of the expected money market shortage. Money market committees of central banks use this critical variable to determine the monetary policy options available to them for market interventions.

An additional aspect that should also be assessed is the potential impact of credit risk on liquidity. If large exposures or excessive sector risk were to materialize, there could be significant consequences for liquidity. The type of credit risk exposure, especially sector concentration, should be considered and specifically evaluated. For example, in the early 1980s, and again in 2007, many

Figure 8.6 Cash Flows of a Bank, by Type



Note: Cash flows are derived from the bank's cash flow statements.

banks in the United States suffered huge losses as a result of poor real estate lending practices.

8.7 Liquidity Risk Management Techniques, Incorporating Basel III Requirements

The framework for liquidity risk management has three aspects: measuring and managing net funding requirements, contingency planning, and market access.

Measuring and Managing Net Funding Requirements

Forecasting possible future events is an essential part of liquidity planning and risk management. The analysis of net funding requirements involves the construction of a maturity ladder and the calculation of the cumulative net excess or deficit of funds on selected dates. Banks should regularly estimate their expected cash flows instead of focusing only on the contractual periods during which cash may flow in or out. For example, cash outflows can be ranked by the date on which liabilities fall due, by the earliest date a liability holder can exercise an early repayment option, or by the earliest date that contingencies can be called.

An evaluation of whether a bank is sufficiently liquid depends on the behavior of cash flows under different conditions. Liquidity risk management must therefore consider various scenarios:

- *Business as usual (BAU):* The "going concern" scenario has established a benchmark for balance sheet-related cash flows during the normal course of business. This scenario is ordinarily applied to the management of a bank's use of deposits.
- *Bank-specific crisis:* This scenario relates to a bank's liquidity in a crisis situation when a significant part of its liabilities cannot be rolled over or replaced—implying contraction of the bank's balance sheet. It relates to many existing liquidity regulations or supervisory liquidity measures.
- *General market crisis:* In this scenario, liquidity is affected in the entire banking system or at least in a significant part of it. Liquidity management under this scenario is predicated on credit quality, with significant differences in funding access among banks. From the perspective of liquidity management, an implicit assumption is that the central bank will ensure access to funding in some form. The central bank has a vested interest in studying this scenario because of the need it would create for a total liquidity buffer for the banking sector—and for a workable means of spreading the burden of liquidity problems among the major banks.

Table 8.2 provides a simple forecasting tool for liquidity needs under these three scenarios. Projections for a bank's liquidity in a crisis should start to be derived systematically and rigorously as soon as the bank foresees persistent liquidity shortfalls or experiences difficulties rolling over or replacing its liabilities. Projections of liquidity during a market crisis should start to be derived at the first indication that the macroeconomic situation is changing or that assumptions regarding the behavior of the bank's assets or liabilities under normal business conditions are not holding. A bank may preempt a potential crisis by deliberately changing the behavior of its assets or liabilities—for example, by becoming more aggressive in the market, by forgoing expected profits, or by severing its relationships with certain types of borrowers.

As noted above, the liquidity gap analysis based on a scenario of business under normal conditions is called the "business-as-usual," or "BAU," liquidity gap. This scenario assumes behavioral adjustments to the balance sheet's maturity profile to consider the rolling nature of deposits, prepayments of certain asset classes, and so on. This BAU liquidity gap represents the bank's liquidity mismatch under normal business conditions, as illustrated by the Nedbank example (table 8.3). Liquidity gap analysis involves detailed quantitative modeling of the cash flow characteristics of products and counterparties to determine behavioral cash flow patterns under normal business conditions.

Table 8.2 Components of a Maturity Ladder under Alternative Scenarios

Cash inflows	Business as usual	Bank-specific crisis	General market crisis
Maturing assets (contractual)			
Interest receivable			
Asset sales			
Drawdowns			
Others (specify)			
Total cash inflows			
Maturing liabilities (contractual)			
Interest payable			
Disbursements on lending commitments			
Early deposit withdrawals			
Operating expenses			
Others (specify)			
Total cash outflows			
Liquidity excess (shortfall)			

Table 8.3 Business as Usual Liquidity Gap Analysis

Rm	Next day	2 to 7 days	8 days to 1 month	1 to 2 months	2 to 3 months	3 to 6 months	6 to 12 months	> 12 months	Total
June 2019									
BaU maturity of assets	1,842	8,572	30,989	29,459	29,614	62,009	129,211	722,237	1,013,933
Loans and advances	300	7,188	25,419	19,398	25,163	56,773	122,812	429,376	686,429
Trading, hedging, and other investment instruments	1,542	1,384	5,570	10,061	4,451	5,236	6,399	220,652	255,295
Other assets								72,209	72,209
BaU maturity of liabilities	3,214	6,884	26,539	26,928	19,076	38,500	75,647	817,145	1,013,933
Stable deposits	1,076	1,420	7,392	8,624	13,320	27,386	48,974	590,817	699,000
Volatile deposits	1,676	4,242	15,550	1,375	2,138	4,316	4,707	7,688	41,692
Trading, hedging, and other instruments	471	1,222	3,597	16,929	3,618	6,798	21,966	124,704	179,305
Other liabilites								93,936	93,936
Net liquidity gap – June 2019	(1,373)	1,688	4,450	2,531	10,538	23,509	53,564	(94,908)	
Off-balance-sheet – June 2019	(88)	(528)	(2,113)	(2,642)					(5,372)
Net liquidity gap – June 2018	(458)	10,657	15,459	11,175	9,381	21,802	37,791	(105,807)	
Off-balance-sheet – June 2018	(66)	(398)	(1,591)	(1,989)					(4,044)
Net liquidity gap – December 2018	(2,271)	3,081	14,364	5,818	7,472	14,775	33,688	(76,927)	
Off-balance-sheet – December 2018	(77)	(462)	(1,847)	(2,308)					(4,694)

Source: Nedbank Group Limited and Nedbank Limited Pillar 3 disclosures—June 2019.

Note: BaU = business as usual; Rm = Rand millions.

The liquidity gap analysis becomes a useful tool when stress testing is performed. The first step is to identify the stress scenarios and attach probabilities to them. The second step is to determine severity by analyzing or estimating the impact of the variables of the stress scenario on the maturity analysis on and off the balance sheet. To do this, a combination of historical examples, known contractual obligations, best estimates or business knowledge, and other methods to determine liquidity at risk per account and counterparty type are used to derive the stress assumptions as input in the stressed liquidity gap.

Liquidity stress scenarios are classified as either bank-specific (idiosyncratic), marketwide, or a combination of both. Banks should perform stress testing of all three types regularly.

Contingency Planning

Diversified liabilities and funding sources usually indicate that a bank has well-developed liquidity management. Also important are the ability to readily convert assets into cash and to have access to other sources of funding in the event of a liquidity shortage. For example, to bridge short-term fluctuations and to prevent problems, banks may ensure that lines of credit or funding are available through other financial institutions. The level of diversification can be judged according to instrument types, the type of fund provider, and geographical markets.

In practice, however, it may be difficult to obtain funding when a dire need for it exists. Certain unusual situations also may affect liquidity risk, including internal or external political upheavals (which can cause large withdrawals), seasonal effects, increased market activity, sector problems, and economic cycles.

Management must evaluate the likely effect of these trends and events on funding requirements. All banks are influenced by economic changes, but sound financial management can buffer the negative changes and accentuate the positive ones. Management must also have contingency plans in case its projections prove to be wrong. Effective planning involves the identification of minimum and maximum liquidity needs and the weighing of alternative courses of action to meet those needs.

Large banks normally expect to derive liquidity from both sides of the balance sheet and maintain an active presence in interbank and other wholesale markets. They look to these markets as sources for the discretionary acquisition of short-term funds on the basis of interest rate competition, a process that can help them meet their liquidity needs. Conceptually, the availability of asset and liability options should result in a lower cost for liquidity maintenance. The costs of available discretionary liabilities can be compared with the opportunity cost of selling various assets, because banks also hold a range of short-term assets that can be sold if necessary. These assets also reassure potential suppliers of funds, thus enhancing a bank's ability to borrow.

The major difference between liquidity in larger and smaller banks is that, in addition to deliberately determining the asset side of the balance

sheet, larger banks can better control the level and composition of their liabilities. They therefore have a wider variety of options from which to select the least costly method of generating required funds. Discretionary access to the money market also reduces the size of the liquid asset buffer that would be needed if banks were solely dependent upon asset management to obtain funds.

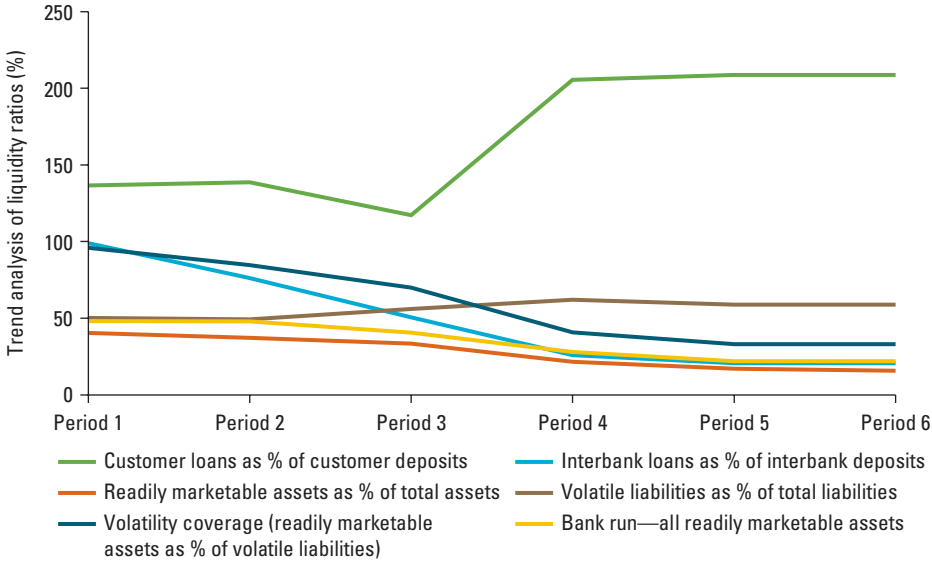
When large volumes of retail deposits and lending are at stake, outflows of funds should be assessed on the basis of probability, with experience serving as a guide. Banks with large volumes of wholesale funds can also manage liquidity through maturity matching. This means that an appropriate degree of correspondence between asset and liability maturities must be sought, but an exact matching of all assets and liabilities is not necessary.

Table 8.4 and figure 8.7 illustrate how a bank's liquidity management can be monitored and be used to determine whether its liquidity position has deteriorated over time. In this case, the percentage of loans funded from the bank's internally generated sources has steadily decreased. In contrast, the percentage of volatile liabilities has increased, and volatility coverage has become significantly worse. Unfortunately, simple graphs such as figure 8.7 cannot tell the whole story. The assessment of bank liquidity—whether by banks, by their supervisors, or by outside analysts—is a complex process that cannot be reduced to any single technique or set of formulas.

Table 8.4 Liquidity Ratios for Trend Assessment

Liquidity ratio	Period 1	Period 2	Period 3
Readily marketable assets (% of total assets)			
Volatile liabilities (% of total liabilities)			
Volatility coverage (readily marketable assets as % of volatile liabilities)			
Bank run (readily marketable assets as % of all deposit-type liabilities)			
Customer loans to customer deposits (%)			
Interbank loans (% of interbank deposits)			
Net loans and investments (% of total deposits)			
Demand deposits (% of customers' deposits)			
Deposits with maturities longer than three months (% of customer deposits)			
Less-than-90-days deposits (% of customer deposits)			
Certificates of deposit (% of customer deposits)			
Ten largest deposits (% of customer deposits)			

Figure 8.7 Trend Analysis of Bank Liquidity Ratios



Market Access

In reality, a bank's position and reputation within the financial community influence its liquidity management options. This connection is based on many factors, the most crucial of which is the bank's past and prospective profitability. Properly understood, a maturity profile can be a useful indicator of a bank's position and may yield important information—for example, when a sudden increase in maturity mismatches occurs. However, maturity profiles should be analyzed in conjunction with information about the bank's off-balance-sheet business, management objectives, and systems of control. Some banks are better positioned than others to quickly alter the maturity pattern of their balance sheet.

Although the acquisition of funds in a market at a competitive cost enables profitable banks to meet the expanding customer demand for loans, the misuse or improper implementation of liability management can have severe consequences. The following risks are associated with the practice of market funding-based liquidity management.

- Purchased funds may not always be available when needed. If the market loses confidence in a bank, the bank's liquidity may be threatened.

- Overreliance on liability management may cause a tendency to minimize the holding of short-term securities and to relax asset liquidity standards, which may result in a large concentration of short-term liabilities that support assets with longer maturities. During times of tight money, this tendency could squeeze earnings and give rise to illiquid conditions.
- As a result of rate competition in the money market, a bank may incur relatively high costs when obtaining funds and may be tempted to lower its credit standards to invest in high-yield loans and securities.
- If a bank purchases liabilities to support assets that are already on its books, the high cost of purchased funds may result in a negative yield spread.
- When national monetary tightness occurs, interest rate discrimination may develop, making the cost of purchased funds prohibitive to all but a limited number of large banks. Small banks with restricted funding should therefore avoid taking excessive loans from money market sources.
- Preoccupation with obtaining funds at the lowest possible cost and with insufficient regard to maturity distribution can greatly intensify a bank's exposure to the risk of interest rate fluctuations.

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9

Managing Liquidity and Other Investment Portfolios

KEY MESSAGES

- The objective of investment management is to maximize the return on a portfolio within policy constraints that address liquidity and market value volatility.
- A bank's liquidity portfolio serves as a source of prudential liquidity to cover short-term liabilities when the bank may not have access to normal sources of funding.
- The liquidity portfolio is also a source of return and is usually actively managed against a benchmark to generate a positive spread over the cost of funds.
- A liquidity policy typically sets the minimum size of the liquidity portfolio, usually in terms of coverage of short-term liabilities.
- The liquidity policy also sets risk limits to control credit risk, interest rate risk, and foreign currency risk to ensure the necessary level of liquidity and to protect earnings and capital. The liquidity portfolio typically is managed against a benchmark portfolio based on the underlying funding or on the holder's liabilities.

9.1 Nature of the Liquidity Portfolio

For commercial banks, the liquidity portfolio traditionally was one of the key tools for liquidity management, providing a backup source of funds to meet unexpected levels of withdrawals or net redemptions.[1] The development of deep and liquid interbank markets, however, means that banks now can borrow to meet any funding shortfalls, with the result that day-to-day liquidity operations have become a liability management issue.

The liquidity portfolio nonetheless has remained as a fallback source of funds to meet liabilities coming due if a bank can't or won't access alternative sources of funding. The tightening or closing of interbank markets can occur during periods of systemic risk, when lenders will not provide funds because of broad risk aversion or because of a negative event specific to the institution.

The objective of investment management is to maximize the return on a portfolio within policy constraints that address liquidity and market value volatility. In most cases, the liquidity portfolio is structured to generate positive return (that is, the return is higher than the cost of funds and contributes positively to the net income of the bank). This is typically achieved by the assumption of credit risk and interest rate risk. In the case of credit risk, the bank invests in securities that have a lower credit standing and thus a higher yield than the bank's funding instruments. This is called credit transformation. In the case of interest rate risk, management will take advantage of the upward slope of the yield curve and invest in assets that have a slightly longer duration than its funding instruments. This is called maturity transformation. Both of these positions normally result in a profit for the bank, but income and capital can be at risk in the event of credit deterioration, yield curve inversion, or upward shifts in yields. These risks need to be tightly controlled to protect bank income and capital from unacceptable levels of loss.

For commercial banks, the size of the liquidity portfolio relative to total assets will tend to increase during periods of slow economic growth, when the demand for commercial and industrial loans is low. Conversely, an increase in economic growth typically leads to a decline in the liquidity portfolio as funds are redeployed toward loans with higher expected returns. For prudential liquidity portfolios, the investment policy should specify a minimum size relative to short-term liabilities to ensure that the portfolio can fulfill its role as a provider of liquidity in times of stress.

9.2 Investment Policy

The investment policy sets out the rationale for holding a liquidity portfolio and defines any target levels, usually in terms of short-term liability coverage. From a regulatory perspective, the target level normally would be described as a liquid asset ratio. The investment policy also sets out broad credit and market risk parameters.

The most neutral market risk position, from the perspective of the balance sheet, matches the risk profile of the liquidity portfolio with the risk profile of the liabilities with respect to currency, duration, and credit. This neutral position is generally referred to as the benchmark position. Any deviation from this position would expose a bank's income and capital to risk.

At the policy level, it is important to specify the baseline position for the liquidity portfolio (the benchmark) and the tolerance for risk resulting from

active management. One efficient way to express this tolerance is in terms of a "risk budget," whereby the board (or its delegates) approves an acceptable level of income or capital loss. This risk budget can then be implemented into a risk management structure, wherein risks are independently measured and limited to ensure that the board's risk tolerance is not exceeded.

9.3 Strategic Asset Allocation

The objective of the strategic asset allocation (SAA) process is to maximize the expected return within the asset-liability management (ALM) constraints relating to liquidity, income, and capital volatility. This process is critical in central banks and banks with large asset management portfolios, but it may be less important in a commercial banking environment.

In the case of central banks, foreign currency reserves portfolios are held to meet a country's need for foreign currency when it cannot borrow from other sources. In broad terms, the optimal long-term risk profile for these reserves is set with respect to the rationale for holding such reserves rather than the composition of the central bank's balance sheet. This is particularly true for emerging markets and other countries that do not enjoy deep and certain access to the capital market borrowings that otherwise could finance any external imbalances. A central bank's investment policy therefore should set out an SAA based jointly on the *rationale* for holding reserves and on the *amount* of reserves that could be considered adequate relative to any actual and contingent claims.

The goal of the SAA is therefore to determine the policy mix of asset classes that becomes the benchmark portfolio—which, subject to the constraints mentioned above, maximizes the value of that portfolio (or minimizes its cost). The SAA uses a quantitative framework to optimize the risk and return characteristics of assets through projections of contingencies that may affect the future liability structure.

The SAA should specify the neutral currency composition, portfolio duration, and eligible instruments. Reserves adequacy and any minimum return requirements should be the main determinants of the desirable risk-return profile for the reserves; this profile should then be embodied in a benchmark portfolio.

Asset managers use the SAA framework to periodically determine the optimal policy mix of asset classes. The process is a two-step exercise: The first step is to propose duration, liquidity, and asset class constraints that are acceptable

and that would enable net worth and liquidity goals to be met. The second step is to select a benchmark that is replicable and that would maximize expected return within these constraints. Critical senior management inputs to the SAA exercise are normally expressed by the board of directors through an investment policy statement including the following elements:

- *Investment policy objectives* (earnings and risk tolerance)
  - Minimum income requirement
  - Credit risk (the tolerance of outright default)
  - Market risk (the tolerance of volatility of returns over the investment horizon)
  - Business risks (consideration of any correlation between asset classes and the core business of the bank)
- *Investment policy constraints*
  - Liquidity requirements
  - Investment time horizon under normal and adverse circumstances
  - Legal, regulatory, and tax considerations
  - Unique needs, such as foreign currency composition, based on currency composition of actual or contingent liabilities.

The importance of the SAA process in terms of the returns generated by each dimension of the portfolio management function is underscored by the finding that the SAA typically accounts for more than 90 percent of long-term performance. Tactical trading is therefore a much less significant driver of portfolio risk and return.

9.4 Benchmark Portfolio

A benchmark portfolio represents the optimal risk profile for the liquidity (investment) portfolio regarding the rationale for holding funds and the characteristics of the underlying liabilities. A good benchmark is a replicable, transparent portfolio strategy that complies with risk constraints. The benchmark provides the baseline for measuring both risk and performance.

From an investment perspective, a benchmark portfolio can be defined as a replicable notional portfolio, approved by senior management, that embodies the investment objectives of the financial institution. It represents the best feasible passive strategy given the objective of holding liquidity, the risk tolerance of the institution, and other constraints (such as capital preservation).

The setting of an investment benchmark can also be described as the "operationalization" of the SAA process.

Benchmarks are critical for evaluating performance versus long-term strategy; they also are used as fallback positions when the portfolio manager has a neutral market view or a stop-loss is triggered. In essence, the long-term objective of the benchmark function—a neutral strategy—is to provide a replicable portfolio with a constant risk profile versus the market. It is used to evaluate both the value added in returns and the risk exposure resulting from active management.

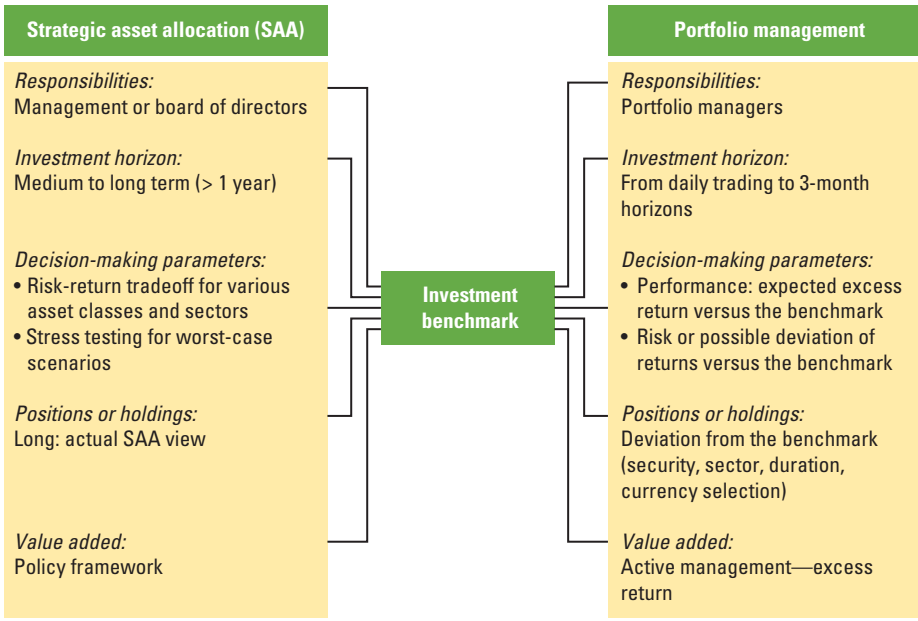
Benchmarks can be set for liabilities as well as assets. A liability benchmark could compare the cost of funding of the institution to that of comparable bond issues of similar institutions with the same credit rating and market standing. However, establishment of a funding benchmark is complicated because there are no standard funding transactions in the market. The credit rating of the issuer is only one factor that influences price; maturity of the issue and specific call or other features also have a major effect on the cost of funding. Only the market environment is really common to all issuers.

The construction of a benchmark focuses on areas that are less emphasized during the SAA process. Benchmarks typically specify a target currency composition, allocation to specific assets or indexes, and a duration target. Figure 9.1 illustrates the bridging aspects of the benchmarking process—providing a context for the evaluation of managers' portfolio performance, in line with the policies decided on during the SAA phase.

Benchmarking is a critical risk management tool, providing a yardstick for the measurement of performance and actual risk from active management. For a benchmark to be realistic, it must represent a simple and unambiguous, flexible, investable, and replicable portfolio that is easily implemented with no influence on market prices. Rules pertaining to the benchmark must be transparent: its characteristics, constituents, and rebalancing rules must be agreed upon in advance and be available or easily accessible for portfolio risk management purposes.

A benchmark is typically constructed using externally available market indexes. These indexes may be made up of a set of specific securities that meet defined characteristics, or the indexes may be based on a synthetic market indicator such as the London Interbank Offered Rate (LIBOR) or a swap rate. These indexes should be combined to create a benchmark portfolio that meets the currency, duration, liquidity, and credit constraints set out in the investment policy.

Figure 9.1 Benchmarking: Link between Strategic Asset Allocation and Portfolio Management



Source: World Bank Treasury training materials.

Table 9.1 shows a few examples of the market indexes generated and made available by index providers.

A good benchmark should be comprehensive and should include all opportunities under normal market conditions. It should provide a fair, realistic baseline strategy. Changes must be few and understandable, and the benchmark should not preclude participants that may not invest in the specific segments or countries addressed by the benchmark. Transaction and tax costs ought to be predictable and transparent. If these criteria are met, performance can be measured against objective indexes.

9.5 Eligible Instruments

Financial instruments are approved for the investment policy when they meet certain criteria based on the rationale for holding these funds. For liquidity portfolios, the main criterion should be the instrument's liquidity—that is, the ability to realize funds in a timely fashion without negatively affecting the price

Table 9.1 Examples of U.S. Dollar Market Indexes

Market sector	Indexes
U.S. government securities	1- to 12-month Treasury bills, 1- to 10-year Treasury bonds
Banks	Overnight federal funds 3-month; LIBID
Mortgage-backed securities	Master mortgage index
Asset-backed securities	USA: provided by Barclays, S&P, and others; Europe: Markit iBoxx ABS
Large capitalization equities	S&P 500

Note: LIBID = London Interbank Bid Rate.

of the instrument. The precondition for liquidity is the existence of deep and broad markets with multiple market makers that stand ready to buy (bid for) the assets. Liquidity is provided through both cash and futures markets because dealers generally are more willing to make continuous markets in instruments in which they can, in turn, offset their risk by using futures.

In assessing the required level of liquidity, policy makers need to consider the investment horizon over which the funds would need to be drawn down. Instruments suitable for working capital or daily liquidity needs are quite different from those that would be liquidated over several months or more. For prudential liquidity portfolios, it is also important to consider the liquidity of the instruments during times of systemic crisis. As noted, systemic crises may exogenously affect a bank's ability to access funds. During such a crisis, the bank may be selling assets in stressed markets, characterized by much lower levels of liquidity.

9.6 Credit Risk

In the context of the liquidity portfolio, credit risk refers to the risk of default. But it is also related to liquidity, because markets for low-rated credits generally are thinner than those for higher-rated credits, and the liquidity of assets with low credit ratings will significantly worsen during systemic crises. For both of these reasons, the investment policy should constrain the credit risk of the investment instrument both at the issuer-specific level and at the portfolio level.

With respect to specific-issuer credit risk, most banks rely on multiple independent credit rating agencies when establishing minimum ratings for eligible assets. When different agencies have split ratings, the policy should

Table 9.2 Credit Risk Management Tools in Liquidity Portfolios

Credit risk type	Risk tool	Benchmark limits
Creditor-specific risk	Credit rating	Minimum rating requirements
	Size of exposure	Maximum exposure as a percentage of the institution's capital base
	Diversification	Maximum exposure to any one institution as a percentage of total assets
Systemic risk	Size of exposure	Maximum exposure to any industry or sector in a single country as a percentage of total assets
Country risk	Credit rating	Maximum exposure per country as a percentage of total assets
		Minimum credit ratings
Sector risk	Sector groupings	Maximum exposure per sector as a percentage of total assets

specify which rating prevails. The allowable level of exposure to any one institution typically also is constrained.

Exposure limits are typically established for exposures to any institution, with the exposure level set usually as a percentage of the creditor institution's own funds.

At the portfolio level, credit risk is controlled through global limits, expressed as a percentage of the total portfolio. A fundamental risk management tool is diversification; typically, the liquidity portfolio will constrain the exposure to any one institution as a maximum percentage of the total portfolio.

In addition, the investment policy may seek to minimize the vulnerability of the portfolio to systemic risks. Systemic risk is defined as a risk that affects a class of institutions that share a common business, country of origin, or type of asset. The investment policy may thus also set a percentage limit to the share of the portfolio that may be exposed to any single country, industry, or sector. Table 9.2 lists various types of credit risk and risk management tools.

9.7 Market Risk

Market risk is defined as the volatility of income or market value resulting from fluctuations in underlying market factors such as currency, interest rates, or credit spreads. For commercial banks, the market risk of the liquidity portfolio arises from mismatches between the risk profile of the assets and their funding.

The benchmark portfolio—which should be based on the currency, duration, and credit characteristics of the underlying liabilities—stands as a proxy for the liabilities. Any deviation from the benchmark portfolio would thus give rise to risk and should be constrained.[2]

9.8 Active Management

Active management is the investment process by which an institution's portfolio is repositioned versus the benchmark portfolio, within the allowable level of risk authorized by the board, to seek excess returns (performance). The institution's investment process ought to be well defined and repeatable, with clear objectives, processes, and accountabilities.

There is no standard investment process. Individual institutions may emphasize different styles of risk taking according to their investment policy, business philosophy, and strengths relative to the market. Some investment processes are fairly centralized, using team-based decisions; others are completely decentralized, allocating to individual risk takers a part of the risk budget within which they manage quite independently. Other investment processes are hybrids, with teams making the fundamental decisions on sector exposures and individual managers implementing these decisions through security selection and tactical trading decisions.

Portfolio management decisions may be based on fundamental analysis of the macro- and microeconomic drivers of value, on technical analysis (charting) of the market, or on exploitation of arbitrage possibilities between different markets using quantitative pricing models. A few institutions, particularly hedge funds, may focus on only one of these techniques, but most banks will use a combination of fundamentals, technical analysis, and modeling to develop their investment strategies.

In assessing the adequacy of risk management systems, it is important to understand the process and style with which investments are made, because an institution's approach to risk taking dictates the level of sophistication required of the risk management system. For example, a highly leveraged portfolio management style would require sophisticated risk measurement and monitoring systems because any losses would be multiplied by the leverage factor. Even low-risk, so-called arbitrage trades can result in devastating losses when highly leveraged, as was seen in the long-term capital management failure of 1999.

At the other extreme, some banks or institutions take much more conservative positions regarding the benchmark, opting for minimal outright market exposure. This management style obviously requires a less sophisticated risk management support system. Figure 9.2 illustrates the relationship between passive management (managing the portfolio to the benchmark), active trading, and directional trading.

Figure 9.2 Three Portfolio Management Styles with Increasing Risk

	Benchmark replication	Enhanced indexing	Directional trading
Objectives	Minimize tracking error	High risk-adjusted returns	High excess return/risk
Strategies	• Security selection • Minimize market risk • Minimize transaction costs	• Security switches • Yield enhancement through credit • Repo/arbitrage	• FX deviations • Duration deviations • Yield curve positions • Leveraged positions
Risk controls	• Deviation limits • Compliance	• Deviation limits • Compliance • Small stop-loss limit	• Deviation limits • Large stop-loss limit • Value at risk • Stress testing

Source: World Bank Treasury training materials.

Note: FX = foreign exchange.

9.9 Risk Budgets and Related Limits

A risk budget establishes the tolerance to income or capital loss from market risk over a given horizon, typically one year because of the accounting cycle. (Institutions that are not sensitive to annual income requirements may have a longer horizon, which would also allow for a greater degree of freedom in portfolio management.)

Once an annual risk budget has been established, a system of risk limits must be put in place to guard against actual or potential losses exceeding the risk budget. Two types of risk limits are necessary to constrain losses to within the prescribed level (the risk budget): stop-loss limits and position limits.

Stop-Loss Limits

Stop-loss limits control cumulative losses from the mark-to-market of existing positions relative to the benchmark. The allocation of the risk budget to different types of risk is as much an art as it is a science, and the methodology will depend on the setup of the individual investment process. Questions affecting the risk allocation include the following:

- What are the significant market risks of the portfolio?
- What is the correlation among these risks?
- How many risk takers are there?
- How is the risk expected to be used over the course of a year?

The risk positions arising from different markets and risk takers generally are not perfectly correlated, and the aggregate of individual stop-loss limits may exceed the risk budget. Compliance with stop-loss limits requires frequent, if not daily, performance measurement. Performance is the total return of the portfolio less the total return of the benchmark. The measurement of performance is a critical statistic for monitoring the use of the risk budget and compliance with stop-loss limits.

Position Limits

Position limits control potential losses that could arise from future adverse changes in market prices. They, too, are set relative to the overall risk budget and are subject to the same considerations discussed above. The function of position limits, however, is to constrain potential losses from future adverse changes in prices or yields (see also chapter 11). Table 9.3 lists the main market risks or market factor sensitivities and the types of position limits that are commonly used to constrain these risks to acceptable levels.

Table 9.3 Market and Position Limit Risk Management Tools

Market risk	Factor sensitivity	Risk management tool (benchmark limits)
Foreign currency	Open position	Percentage deviation
Interest rate risk	• Modified duration DV01 • DV01	• Duration deviation limits • Net DV01 limits
Yield curve exposure	Key rate duration	See note a.
Credit spread risk	DV01 of credit positions	Net DV01 limits
Options		
Directional risk	Delta position	n.a.
Convexity	Gamma	n.a.
Volatility	Vega	n.a.
Portfolio risk	Value at risk (VAR)	Percent of capital[a]

Note: DV01 is the dollar value of a basis point and gives the change in the market value in absolute terms for a basis-point change in yields. "Modified duration DV01" gives the percentage change in the market value for a basis-point change in yields. Delta, Gamma, and Vega are options market terms (collectively referred to as "Greeks") that describe different dimensions of risk in taking an options position. n.a. = not applicable. For currencies other than the US dollar, the term "Basis Point Value (BPV)" may be substituted.

a. Important risk statistics but not conducive to implementation as hard limits.

9.10 Management Reporting

A key element in the delegation of risk-taking authority is the accountability for the risks taken. This usually is effected through management reports. These reports should focus on key statistics relating to

- *The composition* of the portfolio versus the benchmark;
- *The performance to date* of the portfolio and the benchmark; and
- *The existing portfolio risk* as measured by the tracking error or value at risk.

Management reports should also include descriptive analysis of market strategies, market movements, and results. Performance attribution is also extremely useful because it allows for an ex post critique of the results from specific risk-taking activities. This can help an institution to refine its investment process and to focus on those activities in which it has a proven track record and to eschew those activities in which it has been unable to generate adequate returns.

Notes

1. The term "liquidity portfolio" is used as a substitute for "investment portfolio," first to distinguish it from the proprietary trading portfolio, and second to accentuate the prudential nature and minimum level of liquidity that it signifies.
2. For central banks in low- and middle-income countries, the rationale for holding foreign currency reserves is typically that these reserves provide backing for some portion of the country's foreign currency liabilities and assist its management of the exchange rate. The SAA and ensuing benchmark portfolio in such cases thus reflect these underlying contingent liabilities rather than balance sheet values.

10

Market Risk Management

KEY MESSAGES

- Market risk is the risk from losses resulting from the volatility of positions taken in the four fundamental economic markets—interest-sensitive debt securities, equities, currencies, and commodities—as well as the movement in credit risk spreads.
- The volatility of each of these markets exposes banks to fluctuations in the price or value of marketable financial instruments.
- All securities classified as available for sale or fair value through the profit and loss are subject to market risk measurement, whereas portfolios held to maturity eliminate the necessity to recognize fluctuations in market valuations.
- In sophisticated market environments, with sufficient depth, banks can normally hedge against market volatility. The resulting net effective open position determines the amount of the portfolio that remains exposed to market risk.
- Market risk is subject to capital requirements for both the trading book and banking book instruments. Capital has to be retained as a buffer against potential losses from market risk. Minimum capital requirements for market risk have been redefined and updated several times.

10.1 Scope and Framework for Market Risk

Market risk is defined as the risk of losses that a bank may experience in on- and off-balance-sheet positions that arise from unfavorable movements in market prices. More specifically, market risk includes the general and specific interest rate and equity price risks for a bank's trading book of debt and equity instruments and related off-balance-sheet contracts, as well as general foreign exchange and commodities risks throughout the bank (that is, in the trading and banking books). The major components of market risk are therefore interest rate risk, equity risk, commodities risk, currency risk,

credit spread, and default risk. Each component of risk includes a general market risk aspect (trading book) as well as a specific risk aspect that originates in the specific portfolio structure of a bank.

An important part of a bank's internal market risk measurement system is the specification of an appropriate set of market risk factors (that is, the market rates and prices that affect the value of the bank's trading positions). The risk factors contained in a market risk measurement system must be sufficient to capture the risks inherent in the bank's portfolio of the on- and off-balance-sheet trading positions.

Exposure to market risk may arise from the bank's deliberate speculative positions or market-making (dealer) activities. Banks' exposure to market risk has been increasing because of the trend of business diversification away from the traditional intermediation function and toward market-making and trading activities, whereby banks set aside "risk capital" for deliberate risk-taking activities.

The trading portfolio must be distinguished from the liquidity portfolio (see chapter 9). Trading is aimed at exploiting market opportunities with leveraged funding (for example, through repurchase agreements), whereas the liquidity portfolio is held and traded to provide a buffer against liquidity risk. Both proprietary trading and liquidity portfolios are subject to market risk.

The 2008 global financial crisis exposed a number of shortcomings in the precrisis market risk framework that had been in place since 1996. The definition of the regulatory boundary between the banking book (exposures generally subject to credit risk capital requirements) and the trading book (exposures generally subject to market risk capital requirements) relied solely on the bank's intent to trade an instrument and proved to be a key design weakness. It left open the possibility for a bank to move instruments between its trading book and its banking book in pursuit of lower capital requirements, often resulting in insufficient capital requirements relative to an instrument's risks.

The Basel Committee on Banking Supervision (BCBS) introduced new rules for market risk framework and capital charges in 2009, known as Basel 2.5 (BCBS 2019). The new market risk framework required that banks adequately capture incremental risks of all securitized products and that the incremental risk capital charge should capture not only the default risk but also migration risks. Evaluations of the new standards indicated a number of issues, so the rules were updated in 2012 and again in 2016 and 2019.

10.2 Sources of Market Risk

Volatility. The price volatility of most assets held in securities portfolios is often significant. Volatility occurs even in mature markets, although it is much higher in new or illiquid markets. The presence of large institutional investors—such as pension funds, insurance companies, or investment funds—has also had an impact on the structure of markets and on market risk. Institutional investors adjust their large-scale liquidity investment and trading portfolios through large-scale trades, and in markets with rising prices, large-scale purchases tend to push prices up. Conversely, markets with downward trends become more nervous when large, institutional-size blocks are sold. Ultimately, this widens the amplitude of price variances and therefore increases market risk. The advent of electronic trading has further widened this risk.

Interest rate risk. Positions in fixed-income securities and their derivatives (for example, exchange-traded futures, forward rate agreements, swaps, and options) present interest rate risk. The risk factors refer to the aggregate market sensitivity of the bank's portfolio, where the short and long positions in different instruments may be offset.

A set of risk factors corresponding to interest rates in each currency in which the bank has interest rate-sensitive (on- or off-balance-sheet) positions needs to be defined. The risk measurement system should model the yield curve using some generally accepted method—for example, by estimating forward rates of zero coupon yields. The yield curve must be divided into various maturity segments to capture variation in the volatility of rates along the yield curve; there will typically be one risk factor corresponding to each maturity segment. The number of risk factors used should ultimately be driven by the nature of the bank's trading strategies. For instance, a bank with a portfolio of various types of securities across many points of the yield curve and that engages in complex arbitrage strategies would require more risk factors to capture interest rate risk accurately.

Equity risk. Equity risk relates to taking or holding trading book positions in equities or instruments that display equity-like behavior (such as convertible securities) and their derivatives (such as futures and swaps on individual equities or on stock indexes). An equity risk factor designed to capture market-wide movements in equity prices (for example, a market index) must be defined for each of the equity markets in which the bank holds significant positions. The sophistication level of defining the risk factors for a given market should

correspond to the bank's exposure to the market as well as its concentration in individual equity issues in that market.

Banks needing a more detailed equity risk measurement must define risk factors corresponding to various sectors of the overall equity market (for instance, industry sectors, the agriculture sector, or cyclical and noncyclical sectors) or even to individual equity issues. Equity risk for positions in individual securities or sector indexes is typically expressed in "beta equivalents" relative to the marketwide index. For derivatives, the risk is measured by converting the derivative into a notional equity position in the relevant underlying instrument.

Commodity risk. Holding or taking positions in exchange-traded commodities, futures, and other derivatives presents commodity risk. A bank has to define a risk factor corresponding to each of the commodity markets in which the bank holds significant positions. Banks with limited positions in commodity-based instruments typically define one risk factor for each commodity price to which the bank is exposed (including different risk factors for different geographies where relevant). In cases where the aggregate positions are quite small, it might be acceptable to use a single risk factor for a relatively broad subcategory of commodities. If a bank is engaged in active trading, the model must also take account of variation in the "convenience yield" between derivatives positions (such as forwards and swaps) and cash positions in the commodity.

Commodity prices may be volatile because commodity markets are often less liquid than financial markets, and changes in supply and demand can have dramatic effects on prices. Managing a commodity book can be a complex task, as it entails (a) *directional risk* from changes in spot prices; (b) *basis risk* from changes in the price relationship between two similar, but not identical, commodities; and (c) *gap risk*, which captures the changes in forward prices arising from maturity mismatches. Another operational aspect of commodities risk relates to delivery risk and the necessity to close out positions before delivery.

Currency risk. Currency risk refers to trading positions in foreign currencies and gold, because a net position in foreign currency implies a currency risk. The risk measurement system must incorporate risk factors corresponding to the individual foreign currencies in which the bank's positions are denominated. Excluded from this treatment are the "structural positions"—that is, positions of a nondealing or nontrading nature such as investments in foreign branches

(see chapter 11). The net open position in a currency normally includes the spot position, the forward position, the delta-based equivalent of the total book of foreign currency options, and any other items in the trading books that represent profit or loss in foreign currencies.

Default risk. Default risk is the risk of direct loss due to an obligor's default as well as the potential for indirect losses that may arise from a default event. Banks are expected to have a separate model to measure the default risk of trading book positions. Default risk is typically measured using a value at risk (VAR) model. Banks use a default simulation model with two types of risk factors. Default correlations are based on credit spreads or on listed equity prices. Banks must have clear policies and procedures that describe the correlation calibration process, documenting exactly how credit spreads or equity prices are used.

Credit spreads and related risks. Underdeveloped infrastructure in a secondary market could increase risk and complicate risk measurement. For example, in some markets, settlement takes place several days after transactions are concluded. This lengthy settlement period necessitates an accurate assessment of *counterparty risk*—that is, the risk that the position will move into the money during the settlement period but the counterparty fails to deliver. Certain volatility specific to individual securities cannot be explained by other factors and should be factored into overall risk assessment and management. In some countries, markets in financial instruments are not liquid, resulting in potentially much higher market price volatility and therefore greater exposure to risk.

The widespread development of derivative instruments has allowed banks to hedge their open positions in increasingly sophisticated ways. However, because market liquidity is a crucial precondition for the use of such instruments, concern has grown regarding the valuation and effectiveness of hedges made in less-developed markets.

10.3 Selected Market Risk Concepts

Marking to market: recognizing price changes. Marking to market refers to the repricing of a bank's portfolios to reflect changes in asset prices from market price movements. This policy requires that the asset be repriced at the market value of the asset. Because assets in a trading portfolio are constantly sold and bought, price positions related to a bank's trading portfolio should be

evaluated and marked to market at least once per day. The reports prepared in this process should be submitted to and reviewed by the senior bank managers responsible for the bank's investment, asset-liability, and risk management.

Although the process is conceptually simple, marking to market can be difficult in markets that are shallow or lack liquidity. Most banks quantify market risks by tracing the historical loss experienced by various instruments and markets, but banks in volatile or illiquid market environments, often without the benefit of sophisticated technology, face the problem of how to transform this complex analysis into a workable solution that can be effectively applied to their everyday business. The fluctuations in market value for the trading portfolio are reflected in the income statement, and those in the available-for-sale portfolio are taken to equity.

Profit and loss (P&L) attribution. P&L attribution determines whether the risk factors included in the trading desk's risk management model capture the material drivers of the bank's P&L. These drivers are derived from the bank's pricing models to determine whether there is a significant degree of association between the actual and predicted P&L.

Backtesting. In addition to P&L attribution, the performance of a trading desk's risk management models is appraised through daily backtesting, the process of comparing daily profits and losses with model-generated risk measures to assess the quality and accuracy of risk measurement systems. The backtesting assessment is complementary to the P&L attribution assessment when determining the eligibility of a trading desk for the internal models-based approach.

The backtests compare whether the observed percentage of outcomes is consistent with the level of confidence as prescribed by the regulatory authorities (usually 97.5 percent or 99 percent). If this comparison is close enough, the tests raise no issues regarding the quality of the risk measurement models. In some cases, the comparison may uncover differences indicating inconsistencies, either with the model or with the assumptions of the backtest.

Boundary treatment sets guidelines on which instruments must be included in or excluded from the trading book. It defines the link between the regulatory trading book and the set of instruments that banks generally hold for trading purposes. At the same time, it aims to address weaknesses previously seen in the boundary between the regulatory banking book and trading book by reducing the possibility of arbitrage across the two books and by providing more supervisory tools to help ensure more consistent implementation of the boundary across banks.

Capital arbitrage is mitigated by imposing strict limits on the movement of instruments between books, and if the capital charge on an instrument or portfolio is reduced as a result of switching (in the rare instances where this is allowed), the difference in charges (measured at the point of the switch) is imposed on the bank as a fixed, additional disclosed Pillar 1 capital charge. Requirements for the treatment of internal risk transfers from the banking book to the trading book are clearly defined for risk transfers of credit, equity, and interest rate risk.

10.4 Measuring Interest Rate Sensitivity

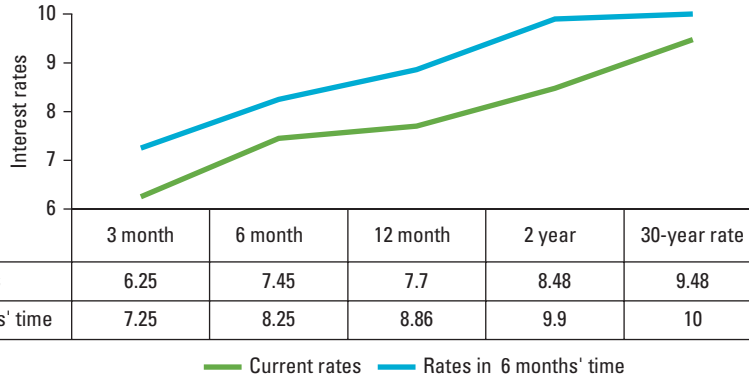
The combination of a volatile interest rate environment, deregulation, and a growing array of on- and off-balance-sheet products have made the management of interest rate risk a growing challenge. At the same time, informed use of interest rate derivatives—such as financial futures and interest rate swaps—can help banks manage and reduce the interest rate exposure that is inherent in their business. Bank regulators and supervisors therefore place great emphasis on the evaluation of bank interest rate risk management.

Repricing risk. Variations in interest rates expose a bank's income and the underlying value of its instruments to fluctuations. The most common type of interest rate risk arises from timing differences in the maturity of fixed rates and the repricing of the floating rates of bank assets, liabilities, and off-balance-sheet positions. The basic tool used for measuring repricing risk is duration, which assumes a parallel shift in the yield curve.

Yield curve risk. Repricing mismatches also expose a bank to risk deriving from changes in the slope and shape of the yield curve (nonparallel shifts). Yield curve risk materializes when these shifts adversely affect a bank's income or underlying economic value. For example, a bank's position may be hedged against parallel movements in the yield curve, such as when a long position in bonds with 10-year maturities is hedged by a short position in 5-year notes from the same issuer. The value of the longer-maturity instrument can still decline sharply if the yield curve increases, resulting in a loss for the bank. Yield curves do not necessarily shift in a parallel fashion (figure 10.1). In such cases, key rate duration (see below) is employed to measure the price impact of the shift.

Basis risk. Also described as spread risk, basis risk arises when assets and liabilities are priced off different yield curves and the spread between these curves shifts. When this happens, income and market values may be negatively affected.

Figure 10.1 Illustration of Nonparallel Shifts in the Yield Curve



	3 month	6 month	12 month	2 year	30-year rate
Current rates	6.25	7.45	7.7	8.48	9.48
Rates in 6 months' time	7.25	8.25	8.86	9.9	10

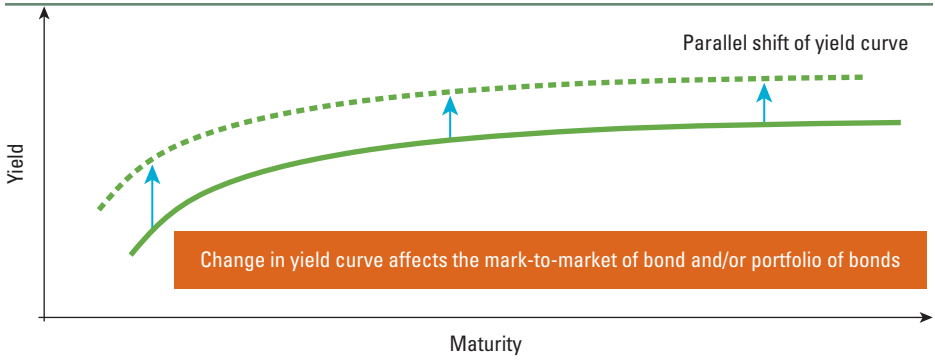
Such situations can occur when assets that are repriced monthly—based on an index rate (such as U.S. Treasury bills) or at the prime rate offered on loans to customers—are funded by liabilities that may also reprice monthly but possibly based on a different index rate (such as the London Interbank Offered Rate [LIBOR] or swaps). Basis risk thus derives from an unexpected change in the spread between the two index rates.

Optionality. An increasingly important source of interest rate risk stems from the options embedded in many bank assets and liabilities (for example, in mortgage-backed securities). Options may be stand-alone derivative instruments, such as exchange-traded options, or they may be embedded within otherwise standard instruments. The latter may include various types of bonds or notes with call or put provisions, nonmaturity deposit instruments that give depositors the right to withdraw their money, or loans that borrowers may prepay without penalty. Such options increase volatility risk as well as prepayment risk.

Duration. Duration is a measure of price sensitivity to changes in interest rates. Specifically, duration gives the percentage change in the price of a fixed-income security for a specified change in interest rates. There are three measures of duration: Macaulay, modified, and effective duration.

Duration has become the single most common measure of interest rate risk for fixed-income investment portfolios and trading positions. Originally it was used exclusively to measure interest rate risk for these portfolios because they were marked to market and the change in the market value reflected in bank's income. Corporate finance specialists, however, have increasingly focused on the firm's economic value in addition to its current earnings. Given this change in focus, modified duration was introduced to measure the sensitivity of the economic value of capital to a change in interest rates.

Figure 10.2 Duration as an Indicator of Interest Rate Risk in a Portfolio



Note: The yield curve is a graphical representation of the interest rates on debt for a range of maturities. The figure illustrates the mark-to-market impact of a *parallel* shift of the curve.

Duration is based on the time to receive the future cash flows. When interest rates rise, the net present value of a fixed set of future cash flows will decline. For marketable securities, this will translate into a commensurate decline in price. Conversely, when interest rates decline, the net present value or price of a series of future cash flows will increase (figure 10.2).

Duration is also additive. The duration for each bond in a bond portfolio can be calculated separately (known as key rate duration) and then added together to determine the duration of the portfolio.

"Key rate duration" is a refinement of duration. It incorporates the fact that the pricing of individual bonds can be determined by different parts of the yield curve and that each part of the yield curve reacts differently to an exogenous price shock (in a nonparallel manner, as illustrated in figure 10.1).

10.5 Portfolio Risk Management

By its very nature, market risk requires constant management attention and adequate analysis. Prudent managers should be aware of exactly how a bank's market risk exposure relates to its capital requirements. Market risk management policies should specifically state a bank's objectives and the related policy guidelines established to protect capital from the negative impact of unfavorable market price movements. Policy guidelines should normally be formulated within restrictions provided by the applicable legal and prudential framework. Although market risk management policies may vary among banks, certain types of policies are typically present in all banks.

Overall Risk Management Process

The overall risk management process should be reviewed at regular intervals (not less than once a year) and must specifically address the following:

- *Organization of the risk control unit*
- *Adequacy of the documentation* of the risk management system and process
- *Accuracy and appropriateness of the risk measurement system* (including any significant changes)
- *Verification of the consistency, timeliness, and reliability of data sources* used to run internal models, including the independence or interdependence of such data sources
- *The approval process for risk pricing models and valuation systems* used by front- and back-office personnel
- *The scope of market risks captured* by the risk measurement model
- *Integrity of the management information system*
- *Accuracy and appropriateness of volatility and correlation assumptions*.

Other matters that should be addressed are pricing responsibility and the method used by a bank to determine the fair value of an asset. Risk management policy should stipulate that prices be determined and the marking to market be executed by officers who are independent of the respective dealer or trader and their managers. Some jurisdictions have enacted prudential regulations that specifically cover the process of marking to market the value of a bank's assets, sometimes with a high level of detail. In practice, the pricing of positions would be less than effective if independent, third-party price quotes were not taken into consideration. A bank should routinely acquire the latest price and performance information available from external sources on assets held in its portfolios.

Portfolio Risk Management Concepts

Position limits. A market risk management policy should provide for limits on positions (long, short, or net positions), bearing in mind the liquidity risk that could arise on execution of unrealized transactions such as open contracts or commitments to purchase and sell securities (for example, option contracts or repurchase agreements). Such position limits should be related to the capital available to cover market risk.

Banks—especially those with large, stable liquidity investment and trading portfolios—are also required to set limits on the level of risk taken by individual traders and dealers. These limits are related to several factors, including

the specific organization of investment and trading functions and the technical skill level of individual dealers and traders. The sophistication and quality of analytical support that is provided to the dealers and traders may also play a role, as do the specific characteristics of a bank's stable liquidity investment or trading portfolios and the level and quality of its capital. This type of policy should specify the manner and frequency of position valuations and position limit controls.

Stop-loss provisions. Market risk management policy should also include stop-loss sale or consultation requirements that relate to a predetermined loss exposure limit (risk budget). The stop-loss exposure limit should be determined with regard to a bank's capital structure and earning trends as well as to its overall risk profile. When losses on a bank's positions reach unacceptable levels, the positions should automatically be closed or consultations initiated with risk management officers or the asset-liability committee to establish or reconfirm the stop-loss strategy.

Limits to new market presence. Financial innovations involve profits that are much higher than those of standard instruments because profit is a key motivating factor to innovate. In a highly competitive market environment, innovation also places pressure on competitors to engage in new business to make profits or to not lose a market presence. However, innovation involves a special kind of risk taking, requiring that a bank be willing to invest in or trade a new instrument even though its return and variance may not have been tested in a market setting—or even though the appropriate market for the instrument may not yet exist.

A prudent bank should have risk management policies that proscribe its presence in new markets and its trading in new financial instruments. Limits related to a new market presence should be frequently reviewed and adjusted. Because the high spreads initially available in new market segments attract competitors, markets may pick up quickly. Increasing use of a new instrument also helps to increase the breadth, depth, and liquidity of related secondary markets. Once a market becomes established and sufficiently liquid, a bank should readjust the limits to levels applicable to mature markets.

Information technology (IT). The availability of sophisticated computer technology in recent years has been instrumental in developing many new financial instruments. Technology has improved the quality and access to information, and this in turn has increased the efficiency and liquidity of the related secondary markets. Modeling and analytical tools that are supported with timely, accurate information and that are internally consistent provide the technical support necessary to conduct transactions and make decisions.

In addition, sophisticated computer programs have enabled the simultaneous processing and risk evaluation of transactions, providing bank management and staff with the information needed to understand in real time the exact nature of risk and the value of open positions.

It is this IT capacity that has enabled banks to actively engage in trading—that is, to take positions in financial instruments, including positions in derivative products and off-balance-sheet instruments. The bank takes these positions with the intention of benefiting in the short term from actual or expected differences between buying and selling prices or from other price or interest rate variations. A bank's trading book may also include positions arising from brokering or market making as well as certain instruments taken to hedge the risk exposures inherent in some trading activities.

Trading desk. Most banks carry out trading activities in organizational units that are separate from standard banking activities. The trading desk in a bank is a defined group of traders or trading accounts responsible for execution of a well-defined business strategy within a clear risk management structure. Each individual trader or trading account must be assigned to only one trading desk. The desk must have a clear reporting line to senior management and a clear and formal compensation policy linked to its preestablished objectives.

There must be a clear definition of the business strategy for the trading desk, including its primary activities and trading and hedging strategies (for example, trading on the shape of the yield curve) and the list of permissible instruments. It must have regular management information reports (including revenue, costs, and risk-weighted assets). Its risk management structure must include clearly defined trading limits based on the desk's business strategy. The desk must also produce, at least weekly, appropriate risk management reports. These would include, at a minimum, P&L reports and internal and regulatory risk measurement reports.

The management process for the bank's trading activities has elements similar to those of investment management. This includes decisions regarding the total volume of the trading book, the portfolio selection, and the security selection—that is, the specific types of financial instruments and their shares of the bank's trading book.

The positions in the trading book are, by definition, held for short-term resale, and transactions are normally triggered by market price movements. The triggers proposed to and endorsed by the responsible senior management are expressed in terms of bid-offer spreads. The structure of the trading portfolio therefore is in constant flux throughout the trading day.

10.6 Market Risk Measurement

Given the increasing involvement of banks in investment and trading activities and the high volatility of the market environment, the timely and accurate measurement of market risk is a necessity, including measurement of the exposures on a bank's liquidity and trading portfolios and on- and off-balance-sheet positions.

Trading activities require highly skilled analytical support. Traders must use some form of technical analysis to gauge market movements and market opportunities. A fundamental analysis of classes of securities and of market behavior is also needed for the trader to be able to anticipate price movements and position the portfolio accordingly. Ex post analysis is also important to understand how market movements have affected profit and loss.

Because of the fast-changing nature of a bank's trading book and the complexity of risk management, banks engaged in trading must have market risk measurement and management systems that are conceptually sound and implemented with high integrity. The BCBS capital adequacy standard for market risk specifies a set of qualitative criteria that must be met for a bank to be eligible for application of the minimum multiplication factor for market risk capital charges (BCBS 2011). These criteria include the following:

- *An independent risk control unit* responsible for the design and implementation of the bank's market risk management system. The unit should be independent from business trading units and should report directly to bank senior management. It should produce daily reports on and analysis of the output of the bank's risk measurement model as well as analysis of the relationship between the measures of risk exposure and trading limits.
- *Active involvement of the board and senior management* in the risk control process, including consideration of risk control as an essential aspect of business. The daily reports prepared by the independent risk control unit should be reviewed by management that has sufficient seniority and authority to enforce reductions in the positions taken by individual traders and reductions in the bank's overall risk exposure.
- *A market risk measurement system* that is closely integrated into a bank's daily risk management process and actively used in conjunction with trading and exposure limits. The risk measurement system should be subject to regular back-testing—that is, to ex post comparison of the risk measure generated by the bank's internal model against daily changes in

portfolio value and against hypothetical changes based on static positions. The ultimate test remains actual profits or losses compared with the budgeted profits.

- *A routine and rigorous program of stress testing* to supplement the risk analysis provided by the risk measurement model. The results of stress testing should be subject to review by senior management and should be reflected in the policies and limits to market risk exposure, especially when stress tests reveal particular vulnerability to a given set of circumstances.
- *A process to ensure compliance* with a documented set of bank policies, controls, and procedures concerning the trading activities and the operation of the risk measurement system.

Standard Calculation of Market Factor Sensitivity

The capacity to systematically assess and measure risk and to effectively manage the net open position is crucial. Methods range from calculation of the net open position (or market factor sensitivity) to VAR and other more sophisticated estimates of risk.

Table 10.1 and figure 10.3 provide examples of a simplistic but practical method to aggregate assets, as reflected on the balance sheet, to arrive at a net open position. Once forward and unsettled transactions are considered, a projected position is determined at book value, translated into market value, and then disclosed in terms of a common denominator representing the equivalent position in the cash markets. This methodology belongs to the static type of market risk measurement tools known as standard or table-based tools. Based on the net open position, one can estimate the potential earnings or capital at risk by multiplying the net open position (market risk factor sensitivity) by the price volatility. This estimate provides a simple, one-factor VAR; it does not, however, take into consideration the correlation between positions.

A simplistic approach to market risk assessment treats every market to which the bank is exposed as a separate entity and does not consider the relationships that may exist between various markets. Each risk is therefore measured individually (table 10.1 and figure 10.3).

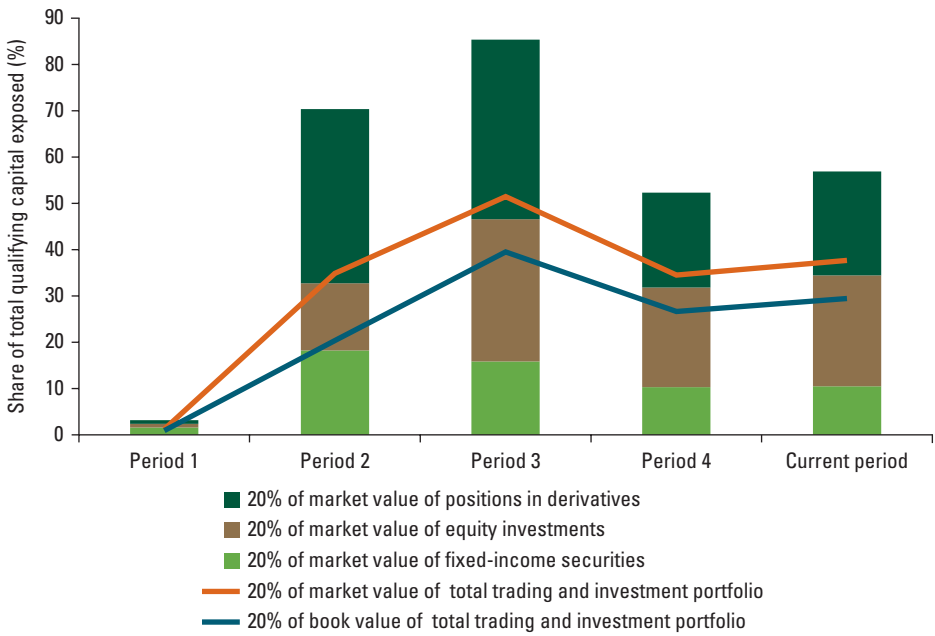
A more comprehensive approach assumes risk assessment from a consolidated perspective, which takes into consideration the relationships between markets and the fact that a movement in one market may affect several others. For example, a fluctuation in the exchange rate may also affect the price of bonds issued in a particular currency.

Table 10.1 Simplistic Calculation of Net Open Positions

Position	Commodities	Fixed income	Equities	Currencies
Net book value of assets per balance sheet				
Forward and unsettled transactions				
Position at book value				
Position at market value before transactions in derivatives				
Position in derivatives (delta-equivalent position in options)				
Net effective open position after transactions in derivatives				
Possible movements in market prices (price volatility)				
Impact on earnings and capital				

Note: Calculation using this table assumes uniform movements in every market.

Figure 10.3 Illustration of Potential Amount of Qualifying Capital Exposed



Value at Risk (VAR)-Based Models

Although VAR or stressed VAR is being replaced by an expected shortfall (ES) measure, it is still important to understand the basic concepts behind it. VAR has been the most frequently used modeling technique that typically measures a bank's aggregate market risk exposure and, given a probability level, estimates the amount a bank would lose if it were to hold specific assets for a certain period of time (box 10.1).

It is a forward-looking method that expresses financial market risk in a form that anybody can understand, namely currency. It measures the predicted

- *Worst loss* (maximum movement of the yield curve),
- *Over a target horizon* (for example, 10 days, which provides the benefit of early detection),
- *Within a given confidence level* (typically a recommended minimum of 97.5 percent).

Inputs to a VAR-based model include data on the bank's positions and on prices, volatility, and risk factors. The data should be sufficiently comprehensive to capture all risks inherent in a bank's on- and off-balance-sheet positions. The risks covered by the model should include all interest, currency, equity, and commodity and option positions inherent in the bank's portfolio.

VAR-based models combine the potential change in the value of each position that would result from specific movements in underlying risk factors with the probability of such movements occurring. The changes in value are aggregated at the level of trading book segments and across all trading activities and markets.

BOX 10.1 Example of VAR Calculation

If the value of a 1 basis point (bp) move is $780, a specific bond's VAR would be determined by the potential overall basis point move, multiplied by $780.

For example, if the potential movement could be 30 bp over a 10-day period, the VAR of the bond will be 30 times $780, or $23,400.

The measurement parameters include a holding period, a historical time horizon at which risk factor prices are observed, and a confidence interval that allows for the prudent judgment of the level of protection (that is, that identifies the maximum acceptable losses). The observation period is chosen by the bank to capture market conditions that are relevant to its risk management strategy.

The VAR amount has been calculated using one of a number of methodologies:

- *The historical simulation approach* calculates the hypothetical change in value of the current portfolio, based on the historical past movements of risk factors.
- *The delta-normal or variance/covariance methodology* is the methodology most widely used by portfolio managers. This approach assumes that the distribution of asset returns is normal and that returns are serially independent (that is, not influenced by the previous day's return). To calculate the potential change in value of the current portfolio, one computes the mean and standard deviation of asset returns to achieve a combination of risk factor sensitivities of individual positions in a covariance matrix, representing risk factor volatilities and correlations between each asset.
- *The Monte Carlo simulation method* constructs the distribution of the current portfolio using a large sample of random combinations of price scenarios, the probabilities of which are typically based on historical experience. This approach is more flexible than the other two methodologies and does not rely on assumptions regarding the normality of returns, but the number of scenarios grows rapidly with the complexity of a portfolio and its risk factors.

Expected Shortfall (ES) Measurement: Average Tail Losses

The BCBS refined its views on market risk over several years, incorporating its views into the February 2019 publication of *Minimum Capital Requirements for Market Risk*. This comprehensive review sought to address the inadequacies in the design and calibration of the market risk framework's internal models and standardized approaches.

Table 10.2 Measures of Market Risk: VAR versus ES

Value at Risk (VAR)	Expected shortfall (ES)
VAR measures the worst expected loss on a portfolio of instruments resulting from market movements over a given time horizon and a predefined confidence level (typically 99 percent over a 60-day period).	ES measures the average of all potential losses exceeding the VAR at a given confidence level (average of the worst 2.5 percent of losses at a 97.5 percent confidence level). The ES measure overcomes the shortcomings of VAR in capturing the risk of extreme (tail risk) losses.

The result was a set of stricter criteria for assigning instruments to the trading book. It overhauled the internal models methodology to better address risks observed during the 2008 global financial crisis; reinforced the process for supervisors to approve the use of internal models; and introduced a new, more risk-sensitive standardized methodology.

The reforms improved the VAR model by introducing an additional VAR-based capital requirement calibrated to the stressed market conditions. As explained in chapter 6, section 6.4, the expected shortfall metric takes better account of tail risk—losses that banks can suffer in a stressed period. Using the average of the worst loss events that exceeded an expected threshold, it tells management what they can expect to lose once the 97.5 percent confidence level has been breached on that given 2.5 out of 100 days (2.5 percent). The difference between ES and VAR outcomes increases in cases of fat-tailed distributions. In the revised market risk framework, the 97.5th percentile ES is roughly equivalent to the 99th percentile VAR used in Basel 2.5.

To recognize the risk of market illiquidity, the ES measure prescribes different liquidity horizons for different risk factors. In this context, "liquidity horizon" is defined as the time required to exit a position or to hedge a risk factor without materially affecting market prices under stressed market conditions. The ES measure calculates the loss that a bank might suffer over the specified liquidity horizon in a period of market stress—a measure that will thus tend to calculate higher capital requirements for less-liquid risk factors. Table 10.2 highlights the difference between VAR and ES, as defined by the BCBS.

10.7 Risk and Performance Measurement

An appraisal of mark-to-market exposures depends on availability of information that meaningfully expresses a bank's exposure to market risk. The information provided (to senior management, the board, and third parties such as

bank supervisors) should include both aggregated and disaggregated exposures at certain control points (in time) and performance information about risk and return, including a comparison of risk and performance estimates with actual outcomes. The disaggregation could be either (a) by standard risk categories or asset classes (for example, equity, fixed-income, currency, commodity); or (b) by some other criterion that more correctly characterizes a bank's risk profile (for example, by business units or risk types).

A bank must have clearly defined policies, procedures, and documented practices for determining which instruments to include in or exclude from the trading book for purposes of calculating their regulatory capital, ensuring compliance with the criteria set forth in this section, and considering the bank's risk management capabilities and practices. A bank's internal control functions must conduct an ongoing evaluation of instruments both in and out of the trading book to assess whether its instruments are being properly designated initially as trading or nontrading instruments in the context of the bank's trading activities. Compliance with the policies and procedures must be fully documented and subject to periodic (at least yearly) internal audit, and the results must be available for supervisory review.

Most of the large banks that are major players with high market risk exposures have developed sophisticated risk indexes and tools for risk assessment and measurement that can be applied across different markets. Although specific arrangements may differ, these internal risk measurement models usually fit a common conceptual framework. The models typically measure a bank's aggregate market risk exposure and, given a probability level, estimate the amount the bank would lose if it were to hold specific assets for a certain period.

Management report examples (as shown in tables 10.3 and 10.4) should include descriptive analyses of market strategies, market movements, and performance results. Risk reporting should also include an analysis of the portfolio's risk characteristics, such as the following:

- Modified duration
- Price (currency) value of a 1 basis point change (PV01)
- Key rate duration.

Risk reports should also cover return characteristics, which emphasize the total return of the portfolio—not only of realized profits and coupon receipts but also of unrealized marked-to-market gains and losses.

Table 10.3 Reporting Performance and Market Risk: Portfolio versus the Benchmark

Performance or risk measure	Portfolio	Benchmark	Excess or deviation (bp or $)
Ex ante: risk reporting			
Portfolio duration (months)—interest rate			
Portfolio duration (months)—credit spread			
Tracking error (bp)—credit spread			
VAR (at 90%, 95%, and 99% confidence level) for 1-day, 1-week, 1-month, 6-month time horizons			
Ex post: performance reporting			
Return: current month (%)			
Return: current year to date (%)			
Return: inception to date (%)			
Holding period (years)			
Tracking error (bp)—interest rate (tracking error equals standard deviation of excess returns)			
Information ratio (excess return divided by the tracking error)			

Note: bp = basis points; VAR = value at risk.

Table 10.4 Illustration of Portfolio Price Movements during Major Market Crises

Market crisis type	Unit	Portfolio losses after				
		1 Day	1 Week	1 Month	3 Months	6 Months
Baht (Thailand) devalues, 1997	US$	–33,792	–130,300	–133,572	–816,255	–1,280,952
	Percent	–0.49	–1.88	–1.93	–11.79	–18.50
Ruble (Russian Federation) devalues	US$	–28,829	–184,603	–9,795	–661,150	–1,365,128
	Percent	–0.42	–2.67	–0.14	–9.55	–19.72
Euro (€) weakens	US$	10,161	–198,632	–468,165	–1,190,649	–1,844,777
	Percent	0.14	–1.40	–2.84	–8.49	–12.87
Dot-com bubble bursts, 2000–02	US$	–23,802	–102,202	–329,826	–1,309,357	–1,300,675
	Percent	–0.34	–1.48	–4.76	–18.91	–18.79
United States in recession, 2007–09	US$	–84,290	–112,331	–272,146	–559,127	–59,209
	Percent	–1.22	–1.62	–3.93	–8.08	–0.86
September 11, 2001, terror attacks	US$	15,112	286,579	477,924	135,269	193,305
	Percent	0.22	4.14	6.90	1.95	2.79
Major corporate bankruptcies	US$	33,687	–31,941	15,066	–734,156	–466,133
	Percent	0.49	–0.46	0.22	–10.60	–6.73

Performance reporting. Accountability for risks taken is normally demonstrated through an effective management reporting system, which allows an assessment of a portfolio's performance and enables management to determine the value added of investment decisions relative to a benchmark. A performance report should cover

- *Overall value added* of active versus passive management;
- *Value added of each strategy and manager*; and
- *Tracking of progress* toward investment objectives.

In addition to the value-added objectives discussed above, performance measurement provides an effective risk control tool for portfolio management, because discussions between the performance measurement staff and the trading staff inevitably lead to the detection of errors and instilling of discipline in the organization.

Performance reports should focus on the following key statistics (table 10.3):

- *Composition* of the portfolio compared with the benchmark
- *Performance to date* of the portfolio and the benchmark
- *Existing portfolio risk* as measured by the tracking error or VAR.

When measuring (calculating) performance, risk analytics staff must keep in mind the following points:

- The same market prices must be used for securities that are held in both the portfolio and the benchmark.
- Performance income must be reconciled with accounting.
- The concept of total return means that unrealized price gains and losses as well as realized coupon and other income are considered in the income (P&L) statement.

Risk analytics staff must also take into consideration the following:

- Cash flows to and from the portfolio, over which the portfolio manager has no control
- Various rate-of-return formulas
- Time-weighted methods
- Internal rates of return
- Linking returns of multiple periods
- Annualizing returns.

Performance attribution—analyzing the components of performance—is also extremely useful because it allows for an ex post critique of the results from specific risk-taking activities. This can help an institution refine its investment process to focus on those activities in which it has a proven track record and to eschew those activities in which it has been unable to generate excess returns.

Supervisory authorities in most countries require at least monthly reporting of market risk position. In the same way as for credit risk and operational risk, the capital requirements for market risk apply on a worldwide consolidated basis. Supervisory authorities may permit banking and financial entities in a group that is running a global consolidated trading book and whose capital is being assessed on a global basis to include just the net short and net long risk positions no matter where they are booked. In certain situations, the individual risk positions could be used without any offsetting or netting against risk positions in the remainder of the group. This may be needed, for example, where there are obstacles to the quick repatriation of profits from a foreign subsidiary or where there are legal and procedural difficulties in carrying out the timely management of risks on a consolidated basis.

10.8 Stress Testing and Scenario Analysis

As mentioned earlier, the BCBS recommendation also includes a requirement that banks establish and regularly use a "routine and rigorous program" of comprehensive stress tests at both the trading desk and bankwide levels to identify events or influences that can negatively affect a bank's capital position. This requirement is critical for banks that use the internal models approach for meeting market risk capital requirements.

The purpose of stress testing is to identify events or influences that may result in a loss—that is, have a negative impact on a bank's capital position. Stress scenarios need to cover a range of factors that can create extraordinary losses or gains in trading portfolios or make the control of risk in those portfolios very difficult. Stress tests should be both qualitative and quantitative in nature, incorporating both market risk and liquidity aspects of market disturbances. Quantitative criteria should identify plausible stress scenarios that could occur in a bank's specific market environment. Qualitative criteria should focus on two key aspects of stress testing: evaluation of the bank's capacity to absorb potentially large losses, and identification of measures that the bank can take to reduce risk and conserve capital.

It is virtually impossible to develop a standard stress test scenario that has a consistent impact on all banks. Stress-testing methodology therefore usually entails a number of steps, including the following (table 10.4):

- *Review of information on the largest losses* experienced during a specific period, compared with the level of losses estimated by a bank's internal risk measurement system. Such a review provides information on the degree of peak losses covered by a given VAR estimate and becomes inputs into an expected shortfall methodology.
- *Simulation of extreme stress scenarios,* including testing of a current portfolio against past periods of significant disturbance. Such testing should incorporate both the large price movements and the sharp reductions in liquidity that are normally associated with these events
- *Evaluation of the degree of sensitivity of a bank's market risk exposure* to changes in assumptions about volatilities and correlations. In other words, the bank's current position should be compared with extreme values within the historical range of variations for volatilities and correlations.
- *Execution of bank-specific test scenarios* that capture specific characteristics of a bank's trading portfolio under the most adverse conditions.

The complexity of stress tests normally reflects the complexities of a bank's market risk exposures and respective market environments. The results of stress tests should be reviewed periodically by senior management and the board and should trigger, as necessary, changes in specific risk management policies and exposure limits. If the stress tests reveal a particular vulnerability, the bank should promptly address the situations and risks that give rise to that vulnerability. The stress test scenarios and the testing results normally are subject to supervisory attention.

Estimates derived from stress tests can also be used for portfolio evaluation and as a management tool. For example, the estimates can be compared with profit earned or loss incurred during the period under review. Comparison of the potential profit impact with reported profits and losses is an added tool for evaluating a bank's market risk management.

References

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11

Currency Risk Management

KEY MESSAGES

- Currency risk results from changes in exchange rates and originates in mismatches between the values of assets and liabilities denominated in different currencies.
- Other types of risk that often accompany currency risk are counterparty risk, settlement risk, liquidity risk, and currency-related interest rate risk.
- When assessing currency risk, one must distinguish between the risk originating in political decisions, the risk resulting from traditional banking operations, and the risk from trading operations.
- Currency risk is managed by establishing position limits.
- The key currency risk management limit is the net effective open position. The net effective open position of all currencies, added together as absolute values and expressed as a percentage of qualifying capital, should not exceed a predetermined value.
- Currency risk management forms part of the asset-liability management process.

11.1 Introduction: Origin and Components of Currency Risk

Currency risk results from changes in exchange rates between a bank's domestic currency and other currencies. It originates from a mismatch when assets and liabilities are valued in different currencies. That mismatch may cause a bank to experience losses as a result of adverse exchange rate movements when the bank has an open on- or off-balance-sheet position, either spot or forward, in an individual foreign currency.

In recent years, a market environment with freely floating exchange rates has practically become the global norm. This has opened the doors for speculative trading opportunities and increased currency risk. The relaxation of exchange controls and the liberalization of cross-border capital movements

have fueled a tremendous growth in international financial markets. The volume and growth of global foreign exchange (FX) trading has far exceeded the growth of international trade and capital flows and has contributed to greater exchange rate volatility and therefore currency risk.

Currency risk arises from a mismatch (a) between the value of assets and that of capital and liabilities denominated in foreign currency (or vice versa), or (b) between foreign receivables and foreign payables expressed in domestic currency. Such mismatches may exist between both principal and interest due. Currency risk is speculative and can therefore result in a gain or a loss, depending on the direction of exchange rate shifts and whether a bank is net long or net short in the foreign currency. For example, in the case of a net long position in foreign currency, domestic currency depreciation will result in a net gain for a bank and appreciation will produce a loss. Under a net short position, exchange rate movements will have the opposite effect.

Fluctuations in the value of domestic currency that create currency risk result mostly from changes in foreign and domestic interest rates that are, in turn, caused by differences in inflation. Such fluctuations are normally motivated by macroeconomic factors and manifest over relatively long periods, although currency market dynamics can often accelerate recognition of the trend. Other macroeconomic aspects that affect the domestic currency value are the volume and direction of a country's trade and capital flows. Short-term factors, such as political events (expected or unexpected), the changed expectations of market participants, or speculation-based currency trading may also give rise to currency changes. All these factors can affect the supply and demand for a currency and therefore the day-to-day movements of the exchange rate in currency markets.

In practical terms, currency risk comprises the following:

- *Transaction risk,* or the price-based impact of exchange rate changes on foreign receivables and payables. In other words, it is the difference in price at which they are collected or paid and their price in local currency in the financial statements of a bank or corporate entity.
- *Economic or business risk* related to the impact of exchange rate changes on a country's long-term or a company's competitive position. For example, a depreciation of the local currency may cause a decline in imports and greater exports.
- *Revaluation risk or translation risk,* which arises when a bank's foreign currency positions are revalued in domestic currency or when a parent institution conducts financial reporting or periodic consolidation of financial statements.

Other risks related to the international aspects of foreign currency business are incurred by banks conducting FX operations. One such risk is a form of credit risk that relates to the default of the counterparty to an FX contract. In such instances, even a bank with balanced books may find itself inadvertently left with an uncovered exchange position. Another form of credit risk peculiar to exchange operations is the time-zone-related settlement risk. This arises when an exchange contract involves two settlements that take place at different times because of a time zone difference, and the counterparty or the payment agent defaults in the interim.

The maturity mismatching of foreign currency positions can also result in interest rate risk between the currencies concerned: a bank can suffer (a) *losses* as a result of changes in interest rate differentials and concomitant changes in the forward exchange premiums, or (b) *discounts* if it has any mismatches with forward contracts or derivatives of a similar nature.

11.2 Policies for Currency Risk Management

Policy-Setting Responsibilities

Many activities of banks involve risk taking, but few can so quickly incur large losses as uncovered FX transactions. This is why currency risk management deserves the close attention of the bank's board and senior management.

The board of directors should establish the objectives and principles of currency risk management. These should specifically include setting appropriate limits to the risks taken by the bank in its FX business and establishing measures to ensure that proper internal control procedures cover this area of the bank's business.

Within this framework, specific policies and limits should be determined by a risk management committee such as the asset-liability management committee (ALCO). The policy guidelines should be periodically reviewed and updated to properly match the bank's risk profile with the quality of its risk management systems and staff skills.

The policy guidelines should also reflect changing circumstances in domestic and international currency markets, accommodating possible changes in the currency system—for example, in the form of capital controls introduced as the result of political decisions or underlying macroeconomic conditions of particular countries that would affect the currency exchange rate. In addition, the policies should specify the frequency of revaluation of foreign currency positions for accounting and risk management purposes. In principle, the frequency

of revaluation and reporting should be commensurate with the size and specific nature of the bank's currency risk exposures.

For management and control purposes, most banks make a clear distinction between foreign currency exposure resulting from dealing and trading operations and exposures resulting from a more traditional banking business involving assets, liabilities, and off-balance-sheet exposures denominated in a foreign currency. These may include loans, investments, deposits, borrowings, or capital, as well as guarantees or letters of credit.

Because of the different nature of operations and the concomitant risk exposures, banks also typically maintain two types of currency risk management processes. Currency risk management involving dealing or trading operations must be an information-intensive, day in, day out process under close scrutiny by senior management and the risk management committee. Management of traditional banking operations, on the other hand, is in most cases carried out monthly.

Types of Currency Risk Limits

Risk exposure limits. A bank has a net position in foreign currency and is exposed to currency risk when its assets (including spot and future contracts to purchase) and its liabilities (including spot and future contracts to sell) are not equal in a given currency. Banks should have written policies to govern their activities in foreign currencies and to limit their exposure to currency risk and therefore to potential incurred losses. In principle, limits are established based on the nature of currency risk and the type of business by which that risk is incurred. These limits, whether expressed in absolute or relative terms, should be related to a bank's risk profile and capital structure and to the history of a currency's market behavior.

Limits may be applicable in various time frames depending on the dynamics of the particular activity. Limits on dealing or trading are typically established for overnight positions, but for some extremely dynamic activities, such as spot trading, intraday limits may be necessary. The less liquid a currency market or the more volatile the currency, the lower the currency risk exposure limit should be.

Net open position limits. The net open position limit is an aggregate limit of a bank's currency risk exposure. Normally expressed as a percentage of the bank's capital, it may also be shown in relation to total assets or some other benchmark. Logically, the net open position limit represents a proxy for the

maximum loss that a bank might incur from currency risk. If the exchange rates of currencies in which a bank holds open positions are perfectly correlated, the limit on a net open position would be sufficient for currency risk management. In terms of aggregation of a bank's exposure to various currencies, the perfect correlation would imply that long and short positions in various currencies could simply be netted.

Because currencies are not perfectly correlated, a bank's choice on how to aggregate net open positions in various currencies to arrive at a total net open position (also known as the gross aggregate position) for currency risk management is an indication of the bank's risk management stance. A conservative bank aggregates by adding together the absolute values of all open positions in specific currencies, implying that the exchange rates of all currencies are expected to move such that all positions would result in simultaneous losses. A less conservative bank often chooses a middle route, such as aggregating all short positions and all long positions in various currencies and taking the larger of the two as an indicator of the aggregate (total) net open position. This latter method, known as the "shorthand method," has been accepted by both the Basel Committee on Banking Supervision (BCBS) and the European Union.

In many countries, prudential regulations specifically limit the net open position—that is, a bank's total exposure to currency risk. In some countries, limits are common for all banks holding an FX license; in others, the limits are established on a bank-by-bank basis according to the supervisors' assessments of the quality of risk management and the technical capacity of staff. International efforts also have been made to reach agreement on capital requirements related to currency risk, with a view to promoting these capital requirements as an international standard.

In principle, the prudential limit established in a particular country should be related to exchange rate volatility. In practice, the prudential limit to the net open position is frequently set at 10–15 percent of a bank's qualifying capital. In periods when significant domestic currency devaluation is expected, the central bank may further restrict short positions in foreign currencies. In countries with relatively stable exchange rates and external convertibility, net open position limits tend to be higher or nonexistent.

Currency position limits. A well-managed bank should also maintain a set of specific limits on its risk exposure to specific currencies. In other words, it should establish limits on net open positions in each currency. Currency position limits can apply to balance sheet revaluation points, overnight positions, or intraday positions. These limits can be adjusted on a case-by-case basis,

depending on the bank's expectations of shifts in the exchange rate between the domestic currency and the foreign currency.

Other position limits. If engaged in currency dealing or trading, a bank should normally maintain limits on spot positions in each currency. Within these limits it also should establish limits for its individual currency dealers or traders. If a bank is engaged in business with derivatives, it should establish limits on the size of mismatches in the FX book. These limits are typically expressed as the maximum aggregate value of all contracts that may be outstanding for a particular maturity. Procedures may vary among banks, but specific limits are generally set daily for contracts maturing in the following week or two, biweekly for contracts maturing in the next six months, and monthly for all other contracts.

Stop-loss exposure limits. Most banks that actively participate in currency markets also maintain "stop-loss" provisions, or predetermined loss exposure limits on various positions and currencies. Stop-loss exposure limits should be determined based on a bank's overall risk profile, capital structure, and earning trends. When losses reach their respective stop-loss limits, open positions should automatically be covered. In volatile or illiquid markets, however, the stop-loss limit may not be fully effective, and the market may move past a stop-loss trigger before an open position can be closed.

Concentration limits. The market value of a foreign currency-denominated contract is normally sensitive to both the contract's maturity and the exchange rates between the relevant currencies. High concentration always increases risk. A bank should therefore establish limits on the maximum face value of a contract in specific currencies or on aggregate face values of all contracts combined.

Settlement risk limits. Settlement can become complex in the context of foreign currency operations because it may involve parties in different time zones and hours of operation. An open position may last for several hours. And although losses rarely materialize, the size of a potential loss can be large. Settlement risk can be mitigated by a request for collateral, but a bank should also establish specific limits on exposure to settlement risk. These limits should be related to the total amount that is outstanding and subject to settlement risk on any given day. A bank may also establish limits on settlement risk within the total exposure limit placed on a counterparty. In such cases, a limit could be viewed as a component of credit risk.

Counterparty risk limits. All transactions involving foreign contracts or foreign currency receivables also involve counterparty risk—the exposure to

loss because of the failure of a counterparty to a contract to make the expected payments. Such risk may in turn be a result of circumstances in the country where the counterparty conducts business. This risk is particularly pronounced in countries that lack external convertibility and where the government imposes restrictions on access to the FX market and on cross-border FX transactions. To minimize the risk, a bank should establish counterparty risk limits, especially for counterparties in countries that lack convertibility or where potential exists for the development of an FX shortage. Overnight and forward positions to individual counterparties are typical. Conservative banks may also establish country limits related to the total exposure to all counterparties based in a specific country.

Internal Control Measures

Revaluation. Revaluation or translation refers to the points when a bank revalues its on- and off-balance-sheet positions to estimate the potential losses that existing positions might produce. Revaluation is essentially the same as "marking to market" except that it pertains to changes (as a result of exchange rate fluctuations) in the domestic currency value of assets, liabilities, and off-balance-sheet instruments that are denominated in foreign currencies. Revaluation is an important risk management tool regardless of whether gains and losses must be recognized for tax or supervisory purposes under applicable accounting regimes.

The frequency of revaluation for internal risk management must be attuned to specific market conditions and to the degree of currency risk implicit in a bank's operations. When estimating potential gains and losses, a bank should use conservative estimates of potential future exchange rate movements. The determination of realistic exchange rates for revaluation can be complex. Estimates are easiest to make for countries with freely convertible domestic currency and are typically derived from historical exchange rate movements. For countries lacking convertibility or where rates are subject to manipulation or government intervention, estimates are difficult to make because rates can change significantly and unexpectedly. Conservative banks also conduct revaluations under worst-case scenarios. Clearly, not all positions can always be closed out, particularly in countries where there is restricted convertibility or market access. The objective is to determine early enough which measures may need to be taken to protect the bank.

Liquidity risk concerns. Currency risk management should incorporate an additional liquidity risk-related aspect. Foreign currency transactions, whether

originating on or off the balance sheet, may introduce cash flow imbalances and may require the management of foreign currency liquidity. This process can be carried out using a liquidity or maturity ladder (discussed in chapter 8) that indicates mismatches and commitments over time in each currency. A bank may also establish limits on mismatches in specific currencies for different time intervals.

In countries where the national currency does not have external convertibility, maturity mismatches result in higher liquidity risk because a bank may have difficulty acquiring the necessary amount of foreign currency in a timely manner. In such countries, the central bank is often an active participant in FX markets and may provide the FX liquidity needed for current account transactions. When assessing the adequacy of a bank's FX liquidity management in a country that lacks external convertibility, an analyst should, for liquidity support, be thoroughly familiar with the applicable FX market arrangements.

Accounting treatment. The accounting treatment of currency risk-related losses is of key importance for a bank's management as well as for analysts and supervisors. Accounting treatments may vary among countries, depending on the purpose of revaluation. However, an analyst should be thoroughly familiar with the International Financial Reporting Standards (IFRS) (in this case, IAS 21) applicable to the accounting treatment of gains or losses arising from currency risk.[1] The analyst should also be familiar with the revaluation process and the accounting rules used by a bank under review for risk and internal management reporting.

Making rules for the recognition of gains or losses that have immediate tax and other implications requires careful consideration by authorities and bank regulators. This is particularly important in unstable economies that lack external convertibility and are characterized by frequent and drastic domestic exchange rate adjustments. In many transition economies, a depreciation of the national currency against the currencies of major trading partners by 200 percent per year is not uncommon, and depreciation by 30–50 percent is frequent. Analysts and supervisors must be extremely careful when interpreting the financial statements of banks in such environments.

For tax and supervisory purposes, revaluations of balance sheet positions are usually considered to be realized gains or losses, and revaluations of off-balance-sheet positions are considered unrealized. The most conservative approach requires that all gains and losses be promptly reflected in earnings. Some regulators require that only realized gains or losses and unrealized losses

be reflected in earnings. Some countries also permit the deferment of recognition of both unrealized gains and unrealized losses, resulting in misstated capital and earnings.

In low- and middle-income countries, the apparent application of a standard accounting treatment of gains and losses may be counterproductive if the taxation system requires tax payment on all gains even if the assets are subject to sale restrictions. In a country with a currency that is depreciating rapidly, even a small open position may create accounting adjustments in amounts comparable to or even greater than a bank's business in the domestic currency.

An example that illustrates this point is a situation that occurred in a transition economy where accounting adjustments of bank balance sheets resulting from exchange rate movements were considered realized gains or losses. In the process of banking system rehabilitation, assets of impaired value were replaced by government securities denominated in freely convertible currencies such as U.S. dollars. This created large net long positions in the banking sector. In the case in question, banks were not allowed to sell or trade bonds if the discount factor was greater than 10 percent, making it impossible for them to close or reduce long positions. Subsequent significant devaluation of the national currency created large "realized" FX gains that were duly taxed. This in turn resulted in the drain of liquidity from the banking sector and significant damage to the banking sector and the entire economy.

11.3 Currency Risk Exposure and Business Strategy

Most banks, especially those operating in countries with unstable currencies, are keenly aware of the risks associated with foreign currency business. The degree of currency risk exposure is therefore a matter of business orientation and is often related to a bank's size. Smaller and new banks often limit their business to servicing the foreign currency needs of their customers. This involves selling or buying foreign currency on the customer's behalf, a process whereby the open currency positions that such transactions create normally are closed within minutes. Such banks, exposed to currency risk for very short periods of time and to a limited extent, therefore do not need elaborate currency risk management.

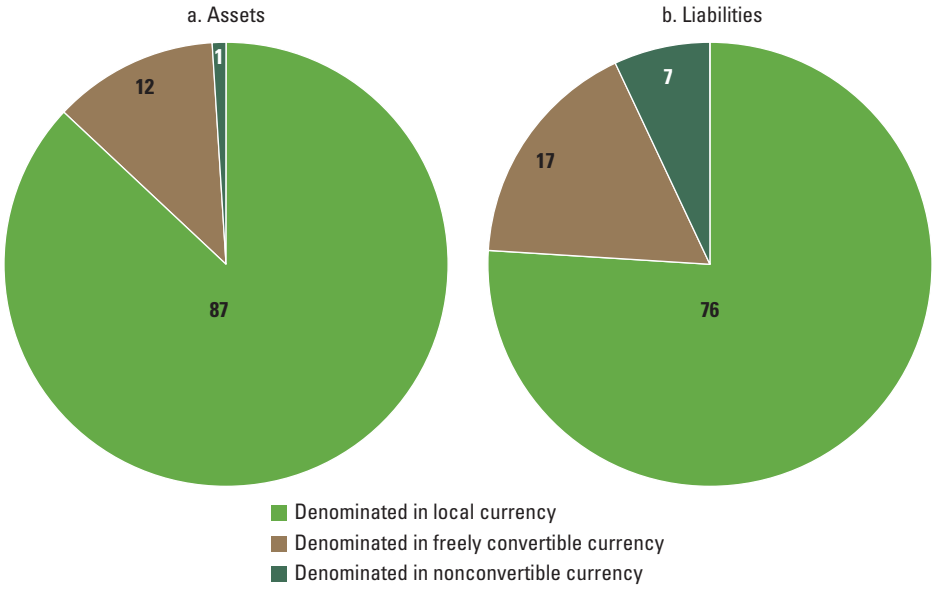
Banks that maintain correspondent banking relationships with foreign banks or that support customer transactions denominated in foreign currencies

are exposed to much higher currency risk. The risk is higher still for banks that lend and borrow in foreign currency, because this may result in open currency positions or maturity mismatches. This business profile is typical of medium-size banks or larger banks in low- and middle-income countries. Figure 11.1 illustrates the potential volume of foreign currency business as part of a bank's balance sheet structure in such a country.

Banks that are engaged in such activities should operate the appropriate currency risk management policies. The extent of operations and risk taking should correspond to the quality of the bank's risk management process and its capital position—and should be in line with the regulatory, macroeconomic, and financial market environment of each respective country.

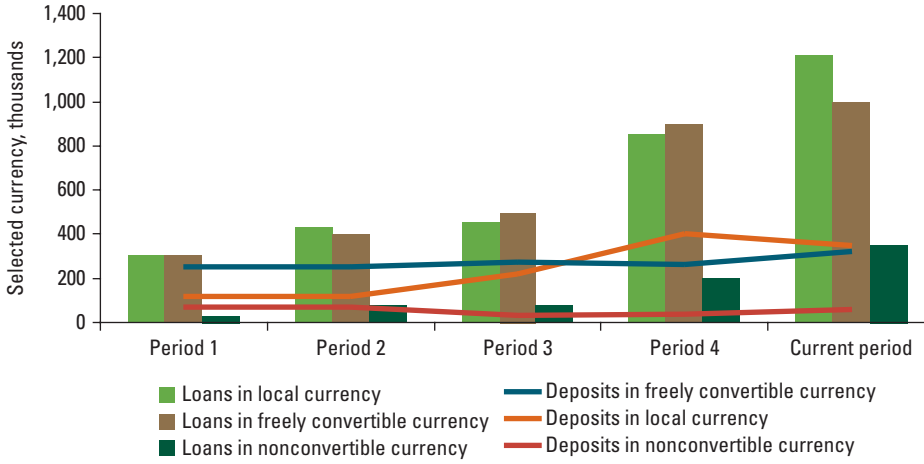
In practical terms, as noted earlier, currency risk management can be an especially challenging task in countries that lack external convertibility. Exchange rate stability can be contrived because conditions in the currency markets of such countries—such as the right of access and the types of transactions allowed in the market—are often subject to manipulation by the authorities. Markets that are shallow can be greatly influenced by expectations, and exchange rate adjustments, when they occur, tend to be drastic and are often introduced at unexpected times.

Figure 11.1 Currency Structure of Bank Assets and Liabilities



Note: Figure represents the foreign currency business on the balance sheet of a bank in a low- or middle-income country.

Figure 11.2 Currency Structure of Loan Portfolio and Customer Deposits



Note: Figure illustrates a bank's increasing exposure to high funding and currency risk from its foreign exchange position.

Banks operating in such environments are exposed to a much higher degree of currency risk, and it is much more difficult to determine sound limits to such exposure.

Figure 11.2 illustrates a bank's currency structure of loans and deposits. The bank is clearly on a fast growth path. Its loan portfolio significantly exceeds the funding capacity provided by its deposit base and indicates that the growth has been fueled by nondeposit borrowings, which probably includes foreign borrowings. The bank is therefore exposed to funding and currency risk. For a bank in a low- or middle-income country—where access to international markets may be limited, subject to restrictions, or even closed by circumstances over which the bank has no control—an FX position such as this entails a high risk exposure.

Recognition of the increased risk and of the needed technical skills associated with the FX business has prompted regulators in almost all countries that do not maintain external convertibility to introduce two types of bank licenses. For a license to operate only in its domestic currency, a bank has to satisfy only minimum capital and technical requirements. A bank wishing to also operate in foreign currencies must meet much higher minimum capital and other requirements to obtain a license. The minimum capital needed for an FX license is typically two to three times more than is required for a domestic currency license.

Spot Trading

Large and well-capitalized banks, including so-called internationally active banks, look to FX operations as a source of profits. Such banks actively engage in currency trading and may play the role of market makers; in other words, they may become dealers in foreign currencies. Banks engaged in currency markets and spot trading may carry sizable net open positions, although for relatively brief periods. In certain circumstances, however, spot rate movements may become so rapid that an open position results in losses in hours or even minutes.

In addition to adequate FX risk management policies, spot trading requires effective organization and technically competent staff, sophisticated technology and effective information systems, and access to up-to-the-minute information. Banks that lack adequate information resources are much more vulnerable to sudden spot rate movements prompted by temporarily unbalanced supply-and-demand conditions, inside information, or rumors.

A bank may also deliberately maintain open positions to take advantage of expected exchange rate movements. This usually takes a form of currency market arbitrage, or sometimes speculation, and involves the buying and selling of foreign currencies, securities, or derivatives. This arbitrage is motivated by discrepancies between spot exchange rates prevailing at the same time in different markets, or differences between forward margins for various maturities or interest rates that exist concurrently in different markets or currencies. Buying a currency in one market for simultaneous sale in another market is termed "arbitrage in space"; the creation of an open position in a currency in anticipation of a favorable future exchange rate movement is "arbitrage in time." Switching from one currency to another to invest funds at a higher yield is "currency-related interest arbitrage." From the point of view of the supervisory authorities, however, any deliberate assumption of risk on an open position is usually characterized as speculation rather than arbitrage.

Forward Transactions

Banks may also be engaged in forward FX transactions, which are settled on the agreed-upon date and at agreed-upon exchange rates. The maturity of the forward contract can be a few days, months, or years.

Forward rates are affected not only by spot rates, which are normally influenced by market conditions, but also by interest rate differentials. A change in differentials may therefore result in a profit or a loss on a forward position,

requiring that these be actively managed. This in turn requires a significant capacity for information processing. In this case, a bank should maintain a forward book, which is usually managed on a gap (mismatch) basis. A forward book typically necessitates a close look, on a weekly or a biweekly basis, at forward positions for contracts nearing maturity, and a look on a monthly basis for other contracts. A bank may take a view regarding expected movements in interest rate differentials and then manage its forward positions in a way that is compatible with expected movements.

Currency Swaps

Banks averse to risk may avoid dealing in forward contracts altogether and instead engage in currency swaps. Two parties to a currency swap agreement exchange a series of payments in different currencies at an agreed-upon exchange rate. A single period swap is referred to as a forward rate agreement. A currency swap avoids a net open currency position but still has to be marked to market. In any case, in a normally dynamic trading environment, it is virtually impossible for a bank active in currency markets to maintain covered positions in all currencies at all times. Short or long positions in various currencies alternate any number of times during a day. At certain times, established by its currency risk management procedures, a bank therefore typically determines its open positions and takes the necessary actions to cover excessive risk exposures, usually by arranging for swaps.

Prudent risk management for a bank normally engaged in a large number of spot and forward transactions each day requires the establishment of a formal procedure for computing unrealized profits and losses at least daily—and calculations more frequent than this are desirable. Such calculations should normally include the entire FX book. This is a precondition for effective portfolio management and provides a bank's management with a meaningful insight into the performance of its FX operations and the associated risk.

11.4 Currency Risk Management and Capital Adequacy

The volume of a bank's foreign currency operations, including its standard on- and off-balance-sheet operations in foreign exchange and trading operations, should normally be determined by the access conditions of and liquidity in respective markets. When assessing a bank's exposure to currency risk and the adequacy of its risk management techniques, an analyst must be aware of the

regulatory environment and market conditions in the relevant countries and of the bank's access to those markets. Currency markets in low- and middle-income countries often have restricted access and may lack liquidity, and the availability of adequate hedging instruments may be limited. These factors should be reflected in the bank's policies and operations.

A key aspect of currency risk management review is the assessment of whether a bank has the capacity to adequately handle its level of FX operations. The bank's currency risk exposure policies, the extent to which risks are taken, risk management procedures, and exactly how exposures are managed all must be taken into consideration. A review should also consider the bank's regulatory and market environment, asset size, capital base, customer volume in FX, staff experience, and other relevant factors. The nature and availability of instruments that can be used to hedge or offset currency risk are also critical.

Policies for Setting Position Limits

The key determinant of currency risk management is the set of policies that place limits on currency risk exposure. Policies should be reassessed regularly to reflect potential changes in exchange rate volatility and an institution's overall risk philosophy and profile. The limits should be established in the context of an institution's overall risk profile to reflect aspects such as capital adequacy, liquidity, credit quality, market risk, and interest rate risk. The relative importance of each policy depends on a particular bank's circumstances and operations.

All applicable policies and procedures, including operational guidelines, should be clearly defined and adjusted whenever necessary. Senior management responsible for policy making must fully understand the risks involved in FX operations. The basis upon which specific policies and exposure limits are formed must be clearly explained in a consistent and logical manner.

The FX risk that also deserves attention is the settlement of FX transactions and the duration of exposure between trade execution and final settlement. The FX settlement risks include principal risk, replacement cost risk, liquidity risk, and legal risk. These risks started to be addressed by the "payment versus payment" (PVP) mechanism in an FX settlement system and the use of close-out netting and collateralization.[2] The BCBS has been active in this area. In 2013, the BCBS updated its guidelines for supervisors and management to ensure that a bank has in place appropriate limits and implements adequate internal controls for its FX business (BCBS 2013), as summarized in table 11.1.

Table 11.1 Summary of BCBS Guidance for Managing Risks Associated with Settlement of Foreign Exchange Transactions

Guidelines	Topic
Governance	A bank should have strong governance arrangements over its FX settlement-related risks, including a comprehensive risk management process and active engagement by the board of directors.
Principal risk	A bank should use FMIs that provide PVP settlement to eliminate principal risk when settling FX transactions. Where PVP settlement is not practicable, a bank should properly identify, measure, control, and reduce the size and duration of its remaining principal risk.
Replacement cost risk	A bank should employ prudent risk mitigation regimes to properly identify, measure, monitor, and control replacement cost risk for FX transactions until settlement has been confirmed and reconciled.
Liquidity risk	A bank should properly identify, measure, monitor, and control its liquidity needs and risks in each currency when settling FX transactions.
Operational risk	A bank should properly identify, assess, monitor, and control its operational risks. A bank should ensure that its systems support appropriate risk management controls and have sufficient capacity, scalability, and resiliency to handle FX volumes under normal and stressed conditions.
Legal risk	A bank should ensure that agreements and contracts are legally enforceable for each aspect of its activities in all relevant jurisdictions.
Capital for FX transactions	When analyzing capital needs, a bank should consider all FX settlement-related risks, including principal risk and replacement cost risk. A bank should ensure that sufficient capital is held against these potential exposures, as appropriate.

Source: BCBS 2013.

Note: BCBS = Basel Committee on Banking Supervision; FMIs = financial market infrastructures; FX = foreign exchange; PVP = payment versus payment.

Risk procedures should cover the level of foreign currency exposure that an institution is prepared to assume and, at a minimum, should include intraday, overnight, and forward limits for currencies in which an institution is authorized to have an exposure—individually and for all currencies combined. Stop-loss limits and settlement limits should also be determined.

Currency risk management can be based on gap or mismatch analysis using the same principles as liquidity risk and interest rate risk management. The process should aim to determine the appropriate mismatch or imbalance between maturing foreign assets and liabilities. This mismatch can be evaluated in light of basic information such as current and expected exchange rates, interest rates (both locally and abroad), and the risk-return profile that is acceptable to bank management. (The market risk related to currency trading is discussed in detail in chapter 10.)

Calculating the Net Effective Open Position

The calculation of a net effective open position in a currency should consider the exposures reflected both on and off the balance sheet and should include:

- *The net spot position:* all asset items minus all liability items, including accrued interest denominated in the currency in question
- *The net forward position:* amounts to be received minus amounts to be paid under forward FX transactions, plus the principal on currency swaps not included in the spot position
- *Mismatched forward commitments*
- *Net positions in derivatives*
- *Positions resulting from operations in foreign branches.*

The net position in all currencies should be aggregated and attention paid to the exact method of aggregation of the open positions that is used by the bank. A conservative bank should aggregate by adding the absolute value of open positions, thereby projecting the worst possible scenario for exchange rate movements. Table 11.2 illustrates a simplistic method to calculate the net effective open position.

Banks in many low- and middle-income countries often handle freely convertible currencies as a single currency for risk management purposes. The rationale for this approach is that risk exposure arising from movements in the exchange rates of hard currencies is much lower than the exposure arising from fluctuations in domestic currency. In addition, the grouping of freely convertible currencies simplifies currency risk management.

Table 11.2 Open Positions in Foreign Currencies

Net effective open position in foreign currencies	U.S. dollars	U.K. pounds	Euros	Swiss francs	Japanese yen	Total
Total foreign currency assets						
Total foreign currency liabilities						
Net spot position						
Mismatched forward commitment						
Foreign branches or operations						
Net position in derivatives						
Net effective open position after hedging						
Maximum net open position during the month						

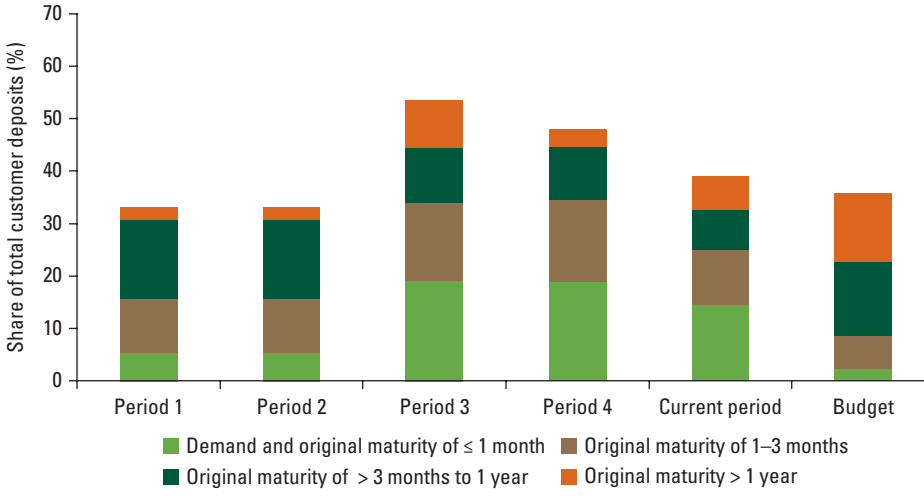
Although this system is usually adequate in countries where banks are not engaged in forward contracts or derivatives, it may backfire in some situations. For example, environmental disasters, political events, and announcements of unexpectedly bad macroeconomic indicators may promptly and significantly increase cross-currency risk.

Maturity Mismatches

When mismatches in the maturity structure occur, interest-rate and liquidity risk develops. A bank should have well-defined procedures for managing such mismatches to maximize income and limit potential loss. Figure 11.3 illustrates a foreign currency deposits maturity structure. The maturity structure of loans funded by these deposits should fully correspond to the deposit maturity structure. If a bank's risk management policies permit the running of mismatches, the analyst should look for evidence that the bank is performing effective "what if" studies. Doing so will help the bank attain an effective limit structure.

Managing maturity mismatches is a challenging task. Regarding maturity gaps in the forward book, the key issue is not the expected behavior of interest rates in relation to the various maturities of a single currency but the expected differential between the interest rates of two currencies for various maturities and the respective risk implications. This is obviously a more complex situation than the management of interest rate risk for a single currency.

Figure 11.3 Maturity Structure of Freely Convertible Currency Deposits



The elimination of maturity gaps on a contract-by-contract basis is practically impossible for a bank that is actively involved in currency markets and that has an FX book comprising hundreds of outstanding contracts.

Maturity gaps are typically handled by the use of swaps. This is a relatively sound risk management practice if any changes in exchange rates are gradual and the size and length of maturity gaps are managed systematically and reasonably well. However, this procedure can result in high costs for bridging maturity gaps when sudden, unexpected changes in interest rates occur that can momentarily influence the market quotations for swap transactions.

Currency Risk Concepts

Capital charges. Currency risk exposure implies the addition of certain capital charges to the charge calculated for market risk (see chapter 6). A bank clearly should be able to prudently carry currency risk. According to various country guidelines, the net open foreign currency position established by a bank should not exceed 10–15 percent of qualifying capital and reserves. Using the shorthand method, capital adequacy is calculated as 8 percent (or the regulatory percentage for the country, if different from 8 percent) of the overall net open position. The overall net open position is measured as the greater of the sum of the net short positions and the sum of the net long positions, plus the net position (short or long) in gold, regardless of the sign.

Alert systems. A bank also should maintain a system of alerts for situations when limits are exceeded. An analyst should expect the bank to have well-defined procedures, including clear assignments of responsibilities, to handle alerts. Adequate procedures and internal controls should be in place for all other key functions related to FX operations. The analyst also should assess the procedures and practices for revaluation and for measuring FX trading gains and losses. A prudent bank should carefully review the names of institutions and individuals with which it does forward exchange business and should request margin cover wherever it is deemed appropriate.

Support Aspects

Staffing. The efficient organization and quality of staff are critical to effective currency risk management. In sum, the staff's skills and experience should be commensurate with the bank's scope of operations. Responsibility for trading, standard FX operations, processing of transactions and payments, front- and back-office (operations) support and account reconciliation, risk

management, and revaluation functions should all be clearly separated. Especially critical is the separation of FX dealing, accounting, and internal control functions. Policies should be formulated by the board and determined by the ALCO. Line management should be responsible for overseeing foreign currency transactions and ensuring compliance with risk limits.

Information support. The analyst should also assess information systems; reporting requirements; and the accounting, auditing, and internal control systems that support FX operations and the currency risk management function and that allow for proper surveillance. Accurate, timely information support is especially critical: a bank with a high volume of FX operations must have proper information support if it is to develop strategies for trading operations and executing specific transactions. Information support also is needed to manage open currency positions, account for transactions and keep the FX book, revalue the financial position, estimate potential gains and losses, and ensure compliance with risk management policies. An analyst should be able to identify the subsystems or modules that support these functions.

In addition, information systems should be capable of generating timely and complete management reports on spot and forward positions, mismatches and liquidity positions, foreign currency-related interest rate risk positions, and counterparty and country exposure positions. Information systems should have the capacity to highlight any exceptions to policy or exposure limits and to bring such exceptions to the attention of management. Information support should include regular reporting to senior management.

Notes

1. The IFRS standard for FX accounting treatment is IAS 21 ("The Effects of Changes in Foreign Exchange Rates"), which the International Accounting Standards Board (IASB) first released in 1983 and reissued in 2003 to apply to annual periods starting January 1, 2005.
2. PVP settlement is "a settlement mechanism that ensures the final transfer of a payment in one currency if, and only if, a final transfer of a payment in another currency occurs" (BCBS 2013). Close-out netting is "a form of netting which occurs following some predefined events, such as default. Close-out netting establishes a close-out payment based on the net present value of future cash flows due between a bank and a defaulting counterparty. Close-out netting is intended to reduce exposures on open contracts with a defaulting counterparty" (BCBS 2013).

Reference

BCBS (Basel Committee on Banking Supervision). 2013. *Supervisory Guidance for Managing Risks Associated with the Settlement of Foreign Exchange Transactions*. Basel: Bank for International Settlements.

12

Asset-Liability Management

KEY MESSAGES

- Asset-liability management—or balance sheet management—is the process whereby a bank's total assets and liabilities are controlled and managed simultaneously, in an integrated fashion.
- Interest rate risk management is one of the key aspects of asset-liability management.
- The asset-liability management committee addresses the protection of both income and capital from interest rate risk, which originates from mismatches in the repricing of assets and liabilities. The goal of interest rate risk management is to maintain interest rate risk exposures within authorized levels.
- Banks generally attempt to ensure that the repricing structure of their balance sheet generates maximum benefits from expected interest rate movements. This repricing structure may also be influenced by liquidity issues, particularly if the bank does not have access to interest rate derivatives to separate its liquidity and interest rate views.
- Banks measure these risks and their impact by identifying and quantifying exposures through use of sophisticated simulation and valuation models as well as a repricing gap analysis.
- The Basel Committee on Banking Supervision limits its guidance to interest rate risk in the banking book. In this chapter, interest rate risk is discussed in the context of overall balance sheet management.

12.1 Objectives of Asset-Liability Management

Banks must ensure that they can articulate the nature and degree of their exposure of earnings, as well as capital, to changes in interest rates. They must also be able to demonstrate and document how this understanding impacts their decision-making process.

Asset-liability management (ALM)—management of the overall balance sheet—comprises the strategic planning and implementation and the control processes that affect the volume, mix, maturity, interest rate sensitivity, quality, and liquidity of a bank's assets and liabilities. These key elements are highly interdependent.

All financial institutions face interest rate risk. When interest rates fluctuate, a bank's earnings and expenses change, as do the economic value of its assets, liabilities, and off-balance-sheet positions. The net effect of these changes is reflected in the bank's overall income and capital.

BOX 12.1 ALM Objectives for Interest Rate Risk Management

In managing the bank's balance sheet, the objective is to ensure that the currency, interest rate, and maturity characteristics of the bank's liabilities and assets are well aligned so that the bank is not exposed to material currency, interest rate, or maturity mismatch risks.

We aim to ensure adequate funding for each product at the most attractive cost and to manage the currency composition, maturity profile, and interest rate sensitivity characteristics of the portfolio of liabilities supporting each lending product in accordance with the particular requirements for that product and within prescribed risk parameters.

We shall achieve our objectives through implementation of an ALM framework leading to a portfolio-wide assessment and monitoring of balance sheet risks. This framework will enable us to advance broader balance sheet risk management issues such as

- *Upgrading the bank's approach* to management of its equity, income immunization techniques, and loan portfolio credit risk management;
- *Consolidating the portfolio-wide approach* to hedging and managing the balance sheet risks so as to exploit transaction netting opportunities and reduce transaction costs; and
- *Executing currency and interest rate swap transactions* as needed to manage all aspects of the bank's balance sheet risks.

Source: Generic example from a treasury ALM group.

Broadly speaking, interest rate risk management (box 12.1) comprises the various policies, actions, and techniques that a bank can use to reduce the risk of diminution of its net equity as a result of adverse changes in interest rates. This chapter discusses various aspects of interest rate risk and reviews the techniques available to analyze and manage it. These include, in particular, repricing and sensitivity analyses.

The central objective of this process—to stabilize and maximize the spread between interest paid to raise funds and interest earned on the bank's assets, and at the same time to ensure adequate liquidity and to constrain risk to acceptable levels—is as old as banking business itself. ALM practices, norms, and techniques have, however, changed substantially in recent years, with many commercial banks using the ALM process to take more risk to enhance income. Moreover, given the complexity and volatility of modern financial markets, the need for good ALM has significantly increased. Adoption of a formal approach to ALM is therefore a prerequisite for an integrated approach to managing the risks associated with both on- and off-balance-sheet items.

The operational aspects of ALM center around the structuring of a bank's balance sheet so the bank can maintain an adequate liquidity and risk profile throughout an interest rate cycle. Bank balance sheets are not totally flexible, in part because assets with long maturities are difficult to securitize or sell. Because it can take some time to change the asset portfolio structure, raise alternative sources of funding, and execute the necessary transactions, the repositioning process normally starts even before the next interest rate cycle begins.

ALM decisions should be coordinated across the relevant operational divisions and must be effectively executed. This necessitates the establishment of a formal institutional structure responsible for ALM. In most banks, this structure typically is an asset-liability management committee (ALCO), the membership of which should include senior line managers of all relevant functional and business processes.

For ALCO decisions to be meaningful, the committee should have at its disposal (a) a broad range of essential information related to investment and trading portfolios; (b) the historical, current, and projected structure of the bank's assets and liabilities; and (c) relevant information on maturities, yields, interest rates and spreads, and repricing capacity and structure. The ALCO should also be informed about the competitive position of the bank's assets, liability rates, and yields in relation to both the market and the bank's major competitors. The projected balance sheet structure and the repositioning strategy should normally be based on a quantitative model of the balance sheet,

following a simulation of various interest rates and (re)pricing scenarios and their effects on the bank's earnings, liquidity, and capital.

The ALM strategy and related decisions should consider and be able to accommodate all relevant limitations and potential distractions. The actions of both bank and nonbank competitors can affect (re)pricing potential. Unforeseen developments on the domestic or international front (such as the Asian financial crisis) or changes in expectations can influence customer or market behavior and require complex adjustments.

12.2 Risk Management Responsibilities

In principle, the sound management of interest rate risk requires systematic and adequate oversight by senior management. Also needed are risk management policies and procedures that are clearly spelled out and commensurate with the complexity and nature of a bank's activities and the level of its exposure to interest rate risk; appropriate risk measurement, monitoring, and control functions; and adequate internal controls.

Interest rate risk should be monitored on a consolidated basis, including the exposure of subsidiaries. This does not imply the use of conventional accounting consolidation—which may allow offsets between positions from which a bank may not in practice be able to benefit, because of legal or operational constraints—but rather the use of proper mechanisms to ensure the completeness and integrity of the information on which the risk management decisions are made.

The bank's board of directors has ultimate responsibility for the management of interest rate risk. The board approves the business strategies that determine the degree of exposure to risk and provides guidance on (a) the level of interest rate risk that is acceptable to the bank; (b) the policies that limit risk exposure; and (c) the procedures, lines of authority, and accountability related to risk management. The board also should systematically review risk to fully understand the level of risk exposure and to assess the performance of management in monitoring and controlling risks in compliance with board policies.

Senior management must ensure that the structure of a bank's business and the level of interest rate risk it assumes are effectively managed, that appropriate policies and procedures are established to control and limit risk, and that resources are available to assess and control it. Reports to senior management should provide aggregate information and enough supporting detail to facilitate

a meaningful evaluation of the level of risk, the bank's sensitivity to changing market conditions, and other relevant factors.

In most cases, day-to-day risk assessment and management is assigned to a specialized committee, such as ALCO. Duties pertaining to key elements of the risk management process should be adequately separated to avoid potential conflicts of interest. In other words, a bank's risk-monitoring and control functions should be sufficiently independent from its risk-taking functions. Larger or more complex banks often designate an independent unit responsible for the design and administration of balance sheet management, including interest rate risk. Given today's widespread innovation in banking and the dynamics of markets, banks should identify any risks inherent in a new product or service before it is introduced and ensure that these risks are promptly considered in the assessment and management process.

Banks should also have an adequate system of internal controls to oversee the interest rate risk management process. A fundamental component of such a system is a regular, independent review and evaluation to ensure the system's effectiveness and, when appropriate, to recommend revisions or enhancements. Supervisory authorities often require the results of such reviews.

The defined limits of risk should be enforced, and banks should introduce adequate procedures to keep risk exposures within those limits and to change the limits when they prove inadequate. At a senior level, limits are normally established relative to a bank's total income or capital and then are broken down by portfolios, activities, or business units. The design of the system of limits should ensure that positions that exceed assigned limits are promptly addressed by management.

The goal of interest rate risk management in the balance sheet is, therefore, to maintain risk exposure within authorized levels, which may be expressed in terms of risk to income, the market value of equity, or both.

12.3 Models for Managing Interest Rate Risk in the Balance Sheet

As mentioned earlier, banks should have clearly defined policies and procedures for limiting and controlling interest rate risk. A bank's interest rate risk measurement system should comprise all material sources of interest rate risk and should be sufficient to assess the effect of interest rate changes on both earnings and economic value. The system should also provide a meaningful measure of the bank's interest rate exposure and should be capable of identifying any

excessive exposures that may arise. It is important that it be based on well-documented, realistic assumptions and parameters. The system should cover all assets, liabilities, and off-balance-sheet positions; should use generally accepted financial concepts and risk measurement techniques; and should provide bank management with an integrated, consistent view of risk in relation to all products and business lines.

"Gap" Model

It was common practice in the 1980s and early 1990s for financial institutions to analyze their exposure to interest rate risk using the "gap" approach. This approach is so named because it aims to allocate assets and liabilities to maturity "buckets" (defined according to their repricing characteristics) and to measure the "gap" at each maturity point.

In a gap model, the components of the balance sheet are separated into items that are sensitive to interest rates and those that are not. These are in turn sorted by repricing period (or modified duration) and allocated to time periods known as time or maturity buckets. Maturity buckets should be set up based on key rates (described as specific maturity points on the spot rate curve) and should take into consideration the correlation of yields.

It is important to note that the focus of this analysis is on repricing (that is, the point at which interest rates may be changed) and not on the concept of liquidity and cash flow. In this approach to risk management, the gap is closed when the repricing of rate-sensitive assets and liabilities is adequately matched. Table 12.1 illustrates a simplified framework for conducting a repricing gap analysis.

A positive gap indicates that a higher level of assets than liabilities reprice in the time frame of the maturity bucket—a balance sheet position also referred to as "asset sensitive." This would give rise to higher income should the specific yield increase. The opposite balance sheet position, a negative gap, is referred to as "liability sensitive" and describes a situation in which a similar increase in the yields associated with a specific time interval would produce a decrease in net interest income (NII).

Theoretically, once a balance sheet repricing position is known, a framework is put into place to judge the overall exposure of a bank to interest rate fluctuations. Management then has the option of structuring a balance sheet to produce a zero gap, which would presumably immunize a bank from interest rate fluctuations. Such protection may, however, also result in lower net interest margins.

Table 12.1 A Repricing Gap Model for Interest Rate Risk Management

Balance sheet items—duration or economic value of equity (EVE)[a]							
1	2	3	4	5	6	7	8
Assets or repricing, key rates	Balance sheet ($, millions)	6 mos.	12 mos.	2 yrs.	30 yrs.	Zero	Key rate duration
Assets and approximate duration (years)	**Amount**	**0.25**	**0.5**	**1**	**15**	**0**	**Calculated**
Cash and balances with central bank	**4,000**	**4**					**0.25**
Securities portfolio (includes stand-alone and hedging derivatives)	34,000	1	3	22	8		4.23
Fair value of positions in derivatives	4,000	4					0.25
Interbank placements	14,000	10		4			0.46
Loans and advances to other customers	76,000		15	46	15		3.66
Fixed assets (net of depreciation)	2,000					2	0.00
Other assets (net of provisions)	6,000					6	0.00
Total assets	**140,000**	**19**	**18**	**72**	**23**	**8**	**3.08**
Weighted duration of assets	**3.08**	**0.03**	**0.06**	**0.51**	**2.46**	**0.00**	**3.08**
ALM derivatives							
Weighted duration of assets after ALM derivatives							
Liabilities and owners capital							
Due to other banks and credit institutions	14,000	14					0.25
Core funding: retail and corporate core deposits	45,000	14	11	5	15		5.31
Noncore funding	8,000	8					0.25
Foreign funding	24,000	12	12				0.38
Fair value of liabilities in respect of derivatives	0.000						
Other borrowings	23,000	8	9		6		4.20
Other liabilities	4,000					4	0.00
Subordinated debt	2,000				2		15.00
Total liabilities	**120,000**	**56**	**32**	**5**	**23**	**4**	**3.17**
Weighted duration of liabilities	**3.17**	**0.12**	**0.13**	**0.04**	**2.88**	**0.00**	**3.17**
Shareholder's equity	20,000						
Total liabilities and capital	**140,000**						**0.00**
Gap	–0.09	–0.08	–0.07	0.47	–0.41	0.00	–0.09
Duration of equity before hedginga	**2.54**						
ALM derivatives							
Weighted duration of liabilities after ALM derivatives							
Duration of equity after using ALM derivatives							

Note: ALM = asset-liability management.

a. Calculation of EVE: 2.54 = [3.08*140 – 3.17*120]/20. The economic value of equity (EVE) is the effective duration of equity—that is, the exposure of the bank's equity to interest rate risk.

Banks generally attempt to ensure that the repricing structure of their balance sheet generates maximum benefits from expected interest rate movements. For example, if a bank expects short-term yields to increase, it would want more assets than liabilities to be repriced in the short term. This is not always possible in practice, however, either because of the structural difficulties in illiquid markets or because exchange controls limit access to offshore markets and to instruments that are designed to help manage risk exposure.

One of the benefits of a repricing gap model is the single numeric result, which provides a straightforward target for hedging purposes. Unfortunately, a repricing gap is a static measure and does not give the complete picture. Where management uses only current-year income to judge rate sensitivity, the repricing approach tends to overlook or downplay the effects of mismatches on medium- or long-term positions. Gap analysis also does not consider variations in the characteristics of different positions within a time band; in other words, all positions within a time band are assumed to mature or reprice simultaneously. In reality, this will happen only to the extent the yields within the maturity bucket are highly or perfectly correlated and reprice off the same yield curve. A cumulative gap can arise from a number of different incremental gap patterns and may obscure yield curve exposures (that is, sensitivity to the changes in the shape of the yield curve). In addition, gap analysis does not consider expected changes in balance sheet structure and ignores both basis risk and the sensitivity of income to option-related positions.

There are other limitations also to the efficacy of gap analysis. The level of net interest margin (the ultimate target of interest rate risk management) is normally determined by the relative yields and volumes of balance sheet items, the ongoing dynamics of which cannot be fully addressed by a static model. Moreover, a static gap model assumes linear reinvestment—a constant reinvestment pattern for forecast NII—and that future funding decisions will be similar to those that resulted in the bank's original repricing schedule. A static gap model thus usually fails to predict the impact of a change in funding strategy on net interest margins.

Repricing gap models nonetheless are a useful starting point for the assessment of interest rate exposure. Banks also have progressed from simple gap analysis to more sophisticated techniques. Ideally, a bank's interest rate measurement system will consider the specific characteristics of each interest-sensitive position and will capture in detail the full range of potential movements. Because this is, in practice, extremely difficult to accomplish, an

ALCO will usually employ a variety of methodologies for interest rate risk analysis.

Other Models for Interest Rate Risk Analysis

Sensitivity analysis. This process applies different interest rate scenarios to a static gap model of a bank's balance sheet (see also chapter 10, table 10.2, where market risk is discussed).

Simulation. This process involves constructing a large and often complex model of a bank's balance sheet. Such a model will be dynamic over time and will integrate numerous variables. The objective of a simulation exercise is to measure the sensitivity of NII, earnings, and capital to changes in key variables. The risk variables used include varying interest rate paths and balance sheet volumes.

Simulation is highly dependent on assumptions, and it requires significant time before the inputs yield meaningful results. It may therefore be more useful as a business planning tool than for interest rate risk measurement. If it is used as a risk measurement tool, the parameters should be highly controlled to generate as objective a measure of risk as possible.

Duration analysis. Table 12.1 illustrates the importance of bank management focusing on the duration of the balance sheet as a whole, including the duration contribution of any derivatives position. Interest rate risk is measured by calculating the weighted average duration of *all* assets, liabilities, and off-balance-sheet positions and then measuring the sensitivity of the equity to a change in interest rates.

The duration analysis model is then used to determine the effective duration of equity (or the economic value of equity [EVE], the exposure of the bank's equity to interest rate risk). It has the advantage of providing a longer-term perspective than other models—such as the simulation and interest rate gap models, which focus on current earnings—and is thus typically used as a complementary measure to set acceptable bands within which the duration exposure of capital may vary.

Market Practice

More sophisticated banking institutions use a mixture of risk management strategies. Banks increasingly use derivative instruments such as swaps, options, and forward-rate agreements to hedge interest rate exposure, and the

more recent techniques (including simulation and duration gap analysis) better incorporate the impact of these instruments on a bank's interest rate position.

Banks should measure their vulnerability to loss under stressful market conditions—including the breakdown of the key assumptions on which their interest rate models are built—and should consider the results of any such assessment when establishing and reviewing their policies and limits on interest rate risk. The stress test should be tailored to a bank's risk characteristics; it should also be designed to provide information on the circumstances in which the bank would be most vulnerable—that is, when the assumptions and parameters on which the interest rate risk measurement or simulation models are based would experience sudden or abrupt changes. Test scenarios should consider such abrupt changes in the general level of interest rates and in the relationships between key market rates (especially those commonly used as index rates). They should also address potential changes in the volatility and liquidity conditions in all markets where the bank maintains a presence.

Because interest rate risk can have adverse effects on both a bank's earnings and its economic value, two separate but complementary approaches exist for assessing risk exposure: NII simulation and EVE analysis.[1] The Basel Committee on Banking Supervision (BCBS) limits its guidance to interest rate risk in the banking book—an approach confirmed in its 2016 publication *Interest Rate Risk in the Banking Book*, which also reconfirmed that interest rate risk should be seen as part of the Pillar 2 (supervisory review) process (BCBS 2016). These principles are listed in table 12.2.

This chapter takes a broader view than Basel when interest rate risk is illustrated in the context of overall balance sheet management.

Net Interest Income (NII)

From the perspective of earnings, which is the traditional approach to interest rate risk assessment, this analysis focuses on the impact of interest rate changes on a bank's net interest income (NII).

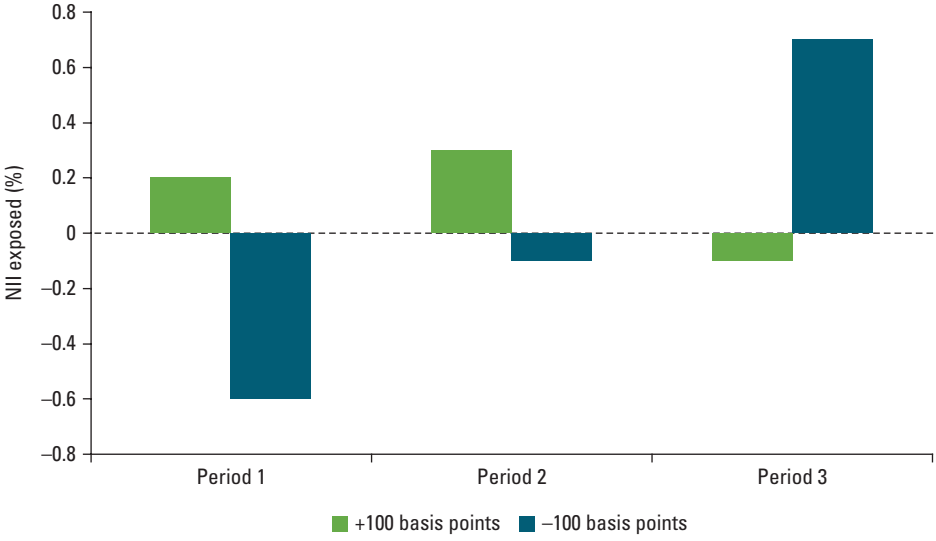
Future interest rates cannot be predicted, but management can simulate the impact on NII under a variety of scenarios, including gradual changes in rates, rapid changes, economic shocks, and growing and shrinking yield curves. The simulation may incorporate likely customer behavior under a given set of facts, or it may test possible outcomes assuming unlikely behaviors or an extreme event. The simulation can be used to analyze the effect of alternative strategies on NII levels.

Table 12.2 BCBS Principles, *Interest Rate Risk in the Banking Book,* 2016

Number	Principle
Principle 1	IRRBB (interest rate risk in the banking book) is an important risk for all banks that must be specifically identified, measured, monitored, and controlled. In addition, banks should monitor and assess CSRBB (credit spread risk in the banking book).
Principle 2	The governing body of each bank is responsible for oversight of the IRRBB management framework and the bank's risk appetite for IRRBB. Monitoring and management of IRRBB may be delegated by the governing body to senior management, expert individuals, or an asset and liability management committee. Banks must have an adequate IRRBB management framework, involving regular independent reviews and evaluations of the effectiveness of the system.
Principle 3	The banks' risk appetite for IRRBB should be articulated in terms of the risk to both economic value and earnings. Banks must implement policy limits that target maintaining IRRBB exposures consistent with their risk appetite.
Principle 4	Measurement of IRRBB should be based on outcomes of both economic value and earnings-based measures, arising from a wide and appropriate range of interest rate shock and stress scenarios.
Principle 5	In measuring IRRBB, key behavioral and modeling assumptions should be fully understood, conceptually sound, and documented. Such assumptions should be rigorously tested and aligned with the bank's business strategies.
Principle 6	Measurement systems and models used for IRRBB should be based on accurate data and subject to appropriate documentation, testing, and controls to give assurance on the accuracy of calculations. Models used to measure IRRBB should be comprehensive and covered by governance processes for model risk management, including a validation function that is independent of the development process.
Principle 7	Measurement outcomes of IRRBB and hedging strategies should be reported to the governing body or its delegates on a regular basis, at relevant levels of aggregation (by consolidation level and currency).
Principle 8	Information on the level of IRRBB exposure and practices for measuring and controlling IRRBB must be disclosed to the public on a regular basis.
Principle 9	Capital adequacy for IRRBB must be specifically considered as part of the Internal Capital Adequacy Assessment Process (ICAAP) approved by the governing body, in line with the bank's risk appetite on IRRBB.
Principle 10	Supervisors should, on a regular basis, collect sufficient information from banks to be able to monitor trends in banks' IRRBB exposures, assess the soundness of banks' IRRBB management, and identify outlier banks that should be subject to review and/or should be expected to hold additional regulatory capital.
Principle 11	Supervisors should regularly assess banks' IRRBB and the effectiveness of the approaches that banks use to identify, measure, monitor, and control IRRBB. Supervisory authorities should employ specialist resources to assist with such assessments. Supervisors should cooperate and share information with relevant supervisors in other jurisdictions regarding the supervision of banks' IRRBB exposures.
Principle 12	Supervisors must publish their criteria for identifying outlier banks. Banks identified as outliers must be considered as potentially having undue IRRBB. When a review of a bank's IRRBB exposure reveals inadequate management or excessive risk relative to capital, earnings, or general risk profile, supervisors must require mitigation actions and/or additional capital.

Source: BCBS 2016.

Figure 12.1 Simulation of Net Interest Income (NII) Sensitivity to Interest Rate Changes



Note: The figure depicts the estimated change in a bank's NII from either an increase or decrease in interest rate of 100 basis points during a given period.

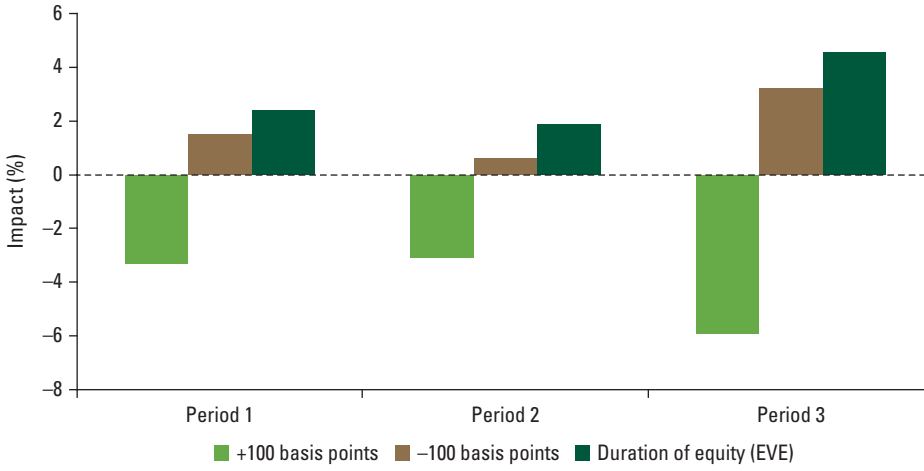
Figure 12.1 depicts the estimated sensitivity of NII to gradual changes in interest rates. The sensitivity is measured as a percentage change from the forecasted NII assuming stable interest rates for the next 12 months. As shown in figure 12.1, a gradual decrease in interest rates (over three periods) would increase NII, and a gradual increase in interest rates would reduce NII.

Economic Value of Equity (EVE)

The impact of interest rate changes on the economic value of equity reflects the sensitivity of the bank's net worth to fluctuations in interest rates. EVE provides a more comprehensive measure of the potential long-term effects of interest rate changes than models that focus on earnings.

While NII simulation highlights interest rate risk over a relatively short time, EVE analysis incorporates all cash flows over the estimated remaining life of all balance sheet and derivative positions. The sensitivity of EVE to changes in the level of interest rates is a measure of the longer-term repricing risk and options risk embedded in the balance sheet. In contrast to the NII simulation, which assumes interest rates will change *gradually* over a period of time, EVE uses *instantaneous* changes in rates.

Figure 12.2 Equity Sensitivity to Interest Rates



Note: The figure depicts the estimated change in a bank's economic value of equity (EVE) from either an increase or decrease in interest rate of 100 basis points during a given period. EVE is, therefore, the effective duration of equity—the discounted present value of cash flows over the estimated lives of instruments.

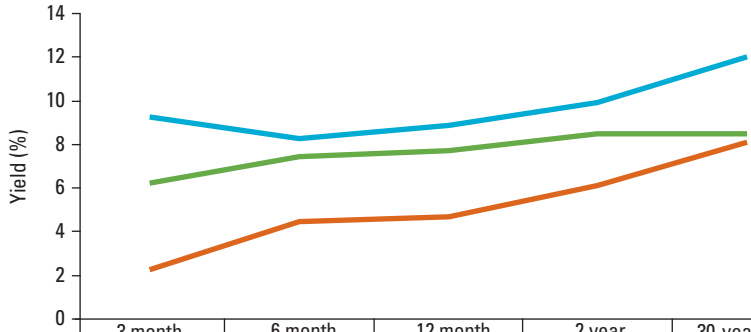
Because EVE measures the discounted present value of cash flows over the estimated lives of instruments, the change in EVE does not directly correlate to the degree of impact on earnings over a shorter period, such as the current fiscal year. Further, EVE does not consider factors such as future balance sheet growth, changes in product mix, changes in yield curve relationships, and changing product spreads that could mitigate the adverse impact of changes in interest rates.

Figure 12.2 reflects the estimated sensitivity of equity to changes in interest rates. The sensitivity is measured as the percentage change in equity.

12.4 The Impact of Changes in Forecast Yield Curves

In addition to the traditional repricing gap method having the limitations of any static model in a dynamic environment, the interpretation of a repricing schedule can also be rather complex and requires in-depth knowledge of a bank's operating characteristics. One can obtain yield curve forecasts from a bank and develop an understanding of the institution's interest rate view. This is a crude but, for the purposes of a bank assessment, effective way to understand the potential impact of a given change in interest rates on an income statement and capital and reserves.

Figure 12.3 Current and Forecast Yield Curves



	3 month	6 month	12 month	2 year	30-year rate
Current rates	6.25	7.45	7.70	8.48	8.48
6 months' time	9.25	8.25	8.86	9.90	12.00
12 months' time	2.25	4.45	4.66	6.11	8.11

Note: The figure depicts the estimated change in a bank's economic value of equity (EVE) from either an increase or decrease in interest rate of 100 basis points during a given period. EVE is the effective duration of equity—the discounted present value of cash flows over the estimated lives of instruments.

Yield Curve Analysis

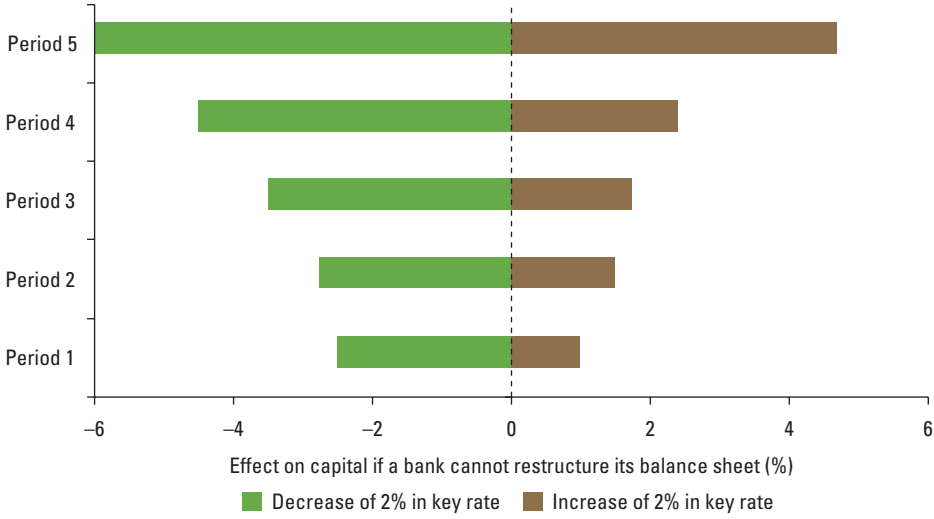
The market's forward yield curves offer a more objective view on the paths interest rates may follow, indicating the market's expectations and providing a "best guess" estimate. The market additionally can provide objective measures of the expected volatility of yields that can be used, within a given confidence level, to measure risk.

It must be accepted that, in certain markets, a balance sheet repricing structure cannot easily be changed. Figure 12.3 illustrates forecast yield curves for a range of instruments and a range of points in time, starting from the current period (displaying the actual yield curve) to a period one year into the future (displaying a forecast yield curve in the future).

Repricing Gaps and Sensitivity Analysis

Figure 12.4 illustrates the effects on income and capital from a change in a key market rate (such as the central bank discount rate). The objective of such a sensitivity analysis is to highlight the effect of a specific key rate on the income statement and on capital and reserves. Interest rate risk may not necessarily result in a loss, but it should be monitored to identify those banks that assume particularly significant levels of risk.

Figure 12.4 Potential Effect on Capital from a Movement in Interest Rates



A bank normally should set limits to the impact it is prepared to absorb to its earnings and to its EVE if market interest rates change. The form of limits should be related to the size and complexity of the bank's positions. For banks engaged in traditional banking activities and that do not hold derivatives or instruments with embedded options, simple limits are enough. For banks with complex and diversified business, a detailed limits system may be needed to consider all possible sources of interest rate risk. Such a system should also consider specific scenarios of movements in market interest rates and historic rate volatilities.

Note

1. For an informative discussion of NII and EVE, see several of the annual reports of SunTrust Banks Inc.

Reference

BCBS (Basel Committee on Banking Supervision). 2016. *Interest Rate Risk in the Banking Book.* Basel: Bank for International Settlements.

13

Operational Risk and the Control Environment

Operational risk is the risk of loss resulting from inadequate or failed internal processes, people, and systems or from external events.

—Basel Committee on Banking Supervision

KEY MESSAGES

- Operational risk has to be *minimized,* whereas credit and market risk are normally *optimized.*
- Operational risk management has become increasingly important since the Basel Committee on Banking Supervision (BCBS) finalized its capital and reporting requirements.
- Operational risk assessments for each business line must identify business functions and activities in the same manner that line managers manage the life cycle of those functions. Such functional activities must be clearly aligned to management's strategic, operational, reporting, and compliance objectives.
- Risk assessments should include more than traditional internal controls to ensure a holistic approach that integrates all aspects of risk, especially technology, information security, and new product and project risk, as well as externalities such as business disruptions.
- Control objectives should be established by considering an entity's business objectives (strategic, operational, financial, and compliance) and then modifying those objectives after due consideration of the risk environment in which they have to be achieved.
- Key controls should be streamlined and reviewed regularly to assess the efficiency of business processes.
- Compliance with laws, regulations, policies, and guidelines is paramount; it is the culture of compliance that determines the environment within which trading decisions are made.
- Operational risk management requires clear reporting, with performance and risk indicators linked to the control of risks arising from business activities.

- Operational risk reports should be designed to ensure that questions related to trends and indicators address *what* happened, *why* it happened, the *impact* of events, and subsequent management *action* and *accountability,* as well as to ensure that the trends and indicators are adequately integrated into the reporting mechanism.

13.1 Operational Risk Management and the Basel Committee Initiatives

Managing operational risk presents some unique challenges to banks. Because operational risk events are largely internal to institutions, the causes or risk factors may not be universally applicable. Moreover, the magnitude of potential losses from specific risk factors is often not easy to predict. Very large operational losses have been considered to be rare or isolated incidents, which causes the perception that it is difficult to get management to focus on the often mundane work required to design an effective mechanism for systematic reporting of trends for bank's operational risks.

The traditional definition of operational risk relies on the sources of risk or events that subject a bank to losses from its methods of operations. The traditional sources of risk are *people*, *processes*, *systems*, and *external events*.

These very sources of risk are also the resources available to a bank when performing its business line functions and risk management activities.

Risk managers attempt to *optimize credit and market risk*, whereas management strives to *minimize operational risk*. Despite these challenges, senior management and the board must be actively involved in the monitoring and reporting of operational risk management by line managers.

Objectives of Operational Risk Management

The objectives of an operational risk management framework and supporting systems are to do the following:

- Define and explain exposures and incidents that result from people, processes, systems, and external events, while also generating enterprisewide understanding of the drivers of operational risk incidents
- Provide early warning of incidents and escalation of potential risk by anticipating risks, while also identifying problem areas through ongoing monitoring of key risk indicators

- Reduce vulnerability to external and systemic effects
- Clearly define the roles and responsibilities of line personnel in managing operational risk, and empower business units to take necessary actions
- Strengthen management oversight
- Provide objective measurement tools
- Integrate qualitative and quantitative data and other information
- Influence business decisions.

Accomplishing these objectives may require a bank to change its behavior and culture. Management must not only ensure compliance with the operational risk policies established by the board but also report regularly to senior executives. This chapter will discuss several tools that can assist them in this task:

- Identification of key performance and risk indicators
- Loss-incident databases
- Risk mapping: graphical representation of the probability and severity of risks
- Self-assessment of the controls in place to manage and mitigate operational risk.

BCBS Initiatives

The BCBS initiatives have increased the attention on operational risk because, in the modern environment, the level of risk for banks has increased. Increased reliance on sophisticated technology, expanding retail operations, growing e-commerce, outsourcing of functions and activities, and greater use of structured finance (derivative) techniques that claim to reduce credit and market risk have all contributed to the higher level of operational risk.

The BCBS *Core Principles for Effective Banking Supervision* addresses operational risk in Principle 25 of the 2012 edition, which requires supervisors to ensure that banks have risk management policies and processes to identify, assess, monitor, and control or mitigate operational risk. These policies and processes should be commensurate with the bank's size and complexity (box 13.1).

In its 2011 guidelines, *Principles for the Sound Management of Operational Risk*, the BCBS describes 11 principles of sound operational risk management (BCBS 2011). These principles cover three main areas, namely governance, the risk management environment, and the role of disclosure.

In 2014, these principles were reviewed for compliance by various countries. The review involved 60 systemically important banks in 20 jurisdictions and

BOX 13.1 Basel Committee's Core Principle 25: Operational Risk

The supervisor determines that banks have an adequate operational risk management framework that takes into account their risk appetite, risk profile, and market and macroeconomic conditions. This includes prudent policies and processes to identify, assess, evaluate, monitor, report, and control or mitigate operational risk on a timely basis.

Essential Criteria

1. Laws and prudential regulations and/or the supervisory authority require banks to have appropriate operational risk management strategies, policies, and processes to identify, assess, evaluate, monitor, report, and control or mitigate operational risk. The supervisor makes an assessment whether the bank's strategy, policies, and processes are consistent with the bank's risk profile, risk appetite, and capital strength, taking into account market and macroeconomic conditions and the bank's systemic importance, and whether operational risk management addresses all major aspects of operational risk prevalent in the businesses of the bank on a bankwide basis (including periods when operational risk could increase).
2. Prudential regulations normally require banks' strategies, policies, and processes for the management of operational risk (including the banks' risk appetite for operational risk) to be approved and regularly reviewed by the banks' boards. The supervisory authorities also require that the board oversees management in ensuring that these policies and processes are implemented effectively.
3. The supervisory authority determines that the approved strategy and significant policies and processes for the management of operational risk are implemented effectively by management and fully integrated into the bank's overall risk management process.
4. The supervisory authority reviews the quality and comprehensiveness of the bank's disaster recovery and business continuity plans to assess their feasibility in scenarios of severe business disruption that might plausibly affect the bank. In so doing, the supervisor determines that the bank is able to operate as a going concern and minimize losses, including those that may arise from disturbances to payment and settlement systems, in the event of severe business disruption.
5. The supervisor determines that banks have established appropriate information technology policies and processes to identify, assess, monitor, and manage technology risks. The supervisor also determines that banks have appropriate and sound information technology infrastructure to meet their

box continues next page

BOX 13.1 Basel Committee's Core Principle 25: Operational Risk *(continued)*

current and projected business requirements (under normal circumstances and in periods of stress), which ensures data and system integrity, security, and availability and supports integrated and comprehensive risk management.

6. The supervisor determines that banks have appropriate and effective information systems to
   a) Monitor operational risk;
   b) Compile and analyze operational risk data; and
   c) Facilitate appropriate reporting mechanisms at the banks' boards, senior management, and business line levels that support proactive management of operational risk.
7. The supervisor requires that banks have appropriate reporting mechanisms to keep the supervisor well informed of developments affecting operational risk at banks in their jurisdictions.
8. The supervisor determines that banks have established appropriate policies and processes to assess, manage, and monitor outsourced activities. The outsourcing risk management program covers
   a) Conducting appropriate due diligence for selecting potential service providers;
   b) Structuring the outsourcing arrangement;
   c) Managing and monitoring the risks associated with the outsourcing arrangement;
   d) Ensuring an effective control environment; and
   e) Establishing viable contingency planning.

   Outsourcing policies and processes require the bank to have comprehensive contracts and/or service-level agreements with a clear allocation of responsibilities between the outsourcing provider and the bank.

Additional Criterion

1. The supervisor regularly identifies any common points of exposure to operational risk or potential vulnerability (for example, outsourcing of key operations by many banks to a common service provider or disruption to outsourcing providers of payment and settlement activities).

Source: BCBS 2012.

covered all 11 principles with a specific focus on the guidance related to the three lines of defense (management, risk function, and internal audit). Overall, the review indicated significant progress between 2003 and 2011. The 11 operational risk principles follow below.

Principles 1 and 2: Fundamental Principles of Operational Risk Management

- *Principle 1:* It is the responsibility of the board of directors to ensure that a strong operational risk management culture exists throughout the whole organization. The board of directors and senior management should establish a corporate culture that is guided by strong risk management concerns and that supports and provides appropriate standards and incentives for professional and responsible behavior.
- *Principle 2:* Banks should develop, implement, and maintain a framework for operational risk management that is fully integrated into the bank's overall risk management processes. The framework for operational risk management chosen by an individual bank will depend on a range of factors, including its nature, size, complexity, and risk profile.

Principles 3 and 4: Governance—The Board of Directors

- *Principle 3:* The board of directors should establish, approve, and periodically review the framework. The board of directors should oversee senior management to ensure that the policies, processes, and systems are implemented effectively at all decision levels.
- *Principle 4:* The board of directors should approve and review a risk appetite and tolerance statement for operational risk that articulates the nature, types, and levels of operational risk that the bank is willing to assume.

Principle 5: Governance—Senior Management

- *Principle 5:* Senior management should develop for approval by the board of directors a clear, effective, and robust governance structure with well-defined, transparent, and consistent lines of responsibility. Senior management is responsible for consistently implementing and maintaining throughout the organization policies, processes, and systems for managing operational risk in all of the bank's material products, activities, processes, and systems consistent with the risk appetite and tolerance.

Principles 6 and 7: Risk Management Environment—Identification and Assessment

- *Principle 6:* Senior management should ensure the identification and assessment of the operational risk inherent in all material products, activities, processes, and systems to make sure the inherent risks and incentives are well understood.
- *Principle 7:* Senior management should ensure that there is an approval process for all new products, activities, processes, and systems that fully addresses operational risk concerns.

Principle 8: Risk Management Environment—Monitoring and Reporting

- *Principle 8:* Senior management should implement a process to regularly monitor operational risk profiles and material exposures to losses. Appropriate reporting mechanisms should be in place at the board, senior management, and business line levels that support proactive management of operational risk.

Principle 9: Risk Management Environment—Control and Mitigation

- *Principle 9:* Banks should have a strong control environment that utilizes policies, processes, and systems; appropriate internal controls; and appropriate risk mitigation and/or transfer strategies.

Principle 10: Business Resiliency and Continuity

- *Principle 10:* Banks should have business resiliency and continuity plans in place to ensure the ability to operate on an ongoing basis and limit losses in the event of severe business disruption.

Principle 11: Role of Disclosure

- *Principle 11:* A bank's public disclosures should allow stakeholders to assess its approach to operational risk management.

A graphic image of the 2003 Basel II model (table 13.1) also provides a possible match of the risk sources (events) to the traditional risk drivers—namely people, processes, systems, and external events.

Table 13.1 Operational Risk Business Lines and Risk Event Types: Basel II (2003) Model

Event types / Business lines	Internal fraud	External fraud	Employment practices and workplace safety	Clients, products, and business services	Damage to physical assets	Business disruption and system failures (technology risk)	Execution, delivery, and process management	*Identify business line with highest incidence of monetary losses*
	Risk drivers							
	People	External events	People	People and processes	External events	Systems and external events	Processes	
Corporate finance								
Trading and sales								
Retail banking								
Commercial banking								
Payment and settlement								
Agency and custody services								
Asset management								
Retail brokerage								
Identify risk source with highest incidence of monetary losses								

The model identifies eight potential business lines and seven event types for which operational risk should be assessed, which is a departure from the textbook description of event types or the sources of risks mentioned earlier.

Although the Basel III approach to operational risk capital uses different business indicators, the 2003 model (even with its shortcomings mentioned below) has value in that it provides a systematic analysis of business lines and sources of operational error. The Basel III business indicators are as follows:

- Net interest, lease, and dividend income
- Services components: net fee and commission income and net other operating income
- Financial components: net profit and loss on the trading and the banking books, respectively.

The issue with the 2003 model presented in table 13.1 is that it does not effectively provide information regarding the functions and activities required to complete the life cycle of a transaction for a specific business line. In addition, many entities view some of the Basel-identified "business lines" (for example, payment and settlement) as functions serving more than one business line rather than as business lines in their own right.

13.2 A Framework for Managing and Reporting Operational Risk

Adopting a consistent framework for operational risk management throughout an entire organization would provide the following advantages:

- Improvements in the organization's control environment
- Automation of activities and improvements in control processes
- Better analysis of risk drivers and more efficient linkage of controls to sources of risk
- Increased risk management awareness by process owners (line managers and staff)
- Management's understanding of its responsibility to manage and monitor risk and controls effectively
- Senior management reporting that is clear, comprehensive, integrated, and actionable
- Leveraging activities rather than duplicating them
- Consistency of standards

- Posing of strategic questions, fostering a shift in corporate mindset and culture
- Provision of a single repository of risk and control data as well as action items
- Enhancement of learning and end-user support.

A structured approach will also increase efficiency. The regulatory burden will be converted into a sound business requirement. By avoiding duplication, audit fatigue can be reduced as multiple redundant audit and control questionnaires are virtually eliminated. Such questionnaires often satisfy only a single unit's objectives and seldom benefit line management.

Management buy-in can be obtained by ensuring that the risk assessment and control phase is used to streamline cumbersome manual processes—processes that may require time-consuming reconciliations after the event—when certain controls may easily be automated. For example, performing risk analysis before introducing new projects and products could promote a successful launch by alerting management to potential problems in advance. Moreover, it would be more cost-effective than having to alter processes after the fact if a postevent analysis identifies unacceptable risk.

When implementing any framework, risk managers should avoid falling into the trap of allowing a software model to dictate the operational risk management methodology. Tools should not manage operational risk.

Any business or service function in a bank can be divided into enterprisewide functions and operational functions to achieve a business life cycle-based framework through application of the Committee of Sponsoring Organizations of the Treadway Commission (COSO) thought process.

The enterprisewide processes are as follows:

- Strategy: definition of a business product or service line
- Governance and risk management
- Product and services development
- Infrastructure and capacity determination: human, technology, and premises delivery channels
- Resource management.

On an operational level, the functions include the following:

- New client take-on and portfolio set-up
- Deal and transactions execution and portfolio management
- Settlements and payments

- Accounting and reconciliations, valuation, and measurement
- Integrated performance, risk, and compliance analytics.

This was necessary because the COSO approval would take too long. Table 13.2 illustrates the implementation of an operational risk methodology that incorporates both the COSO approach to enterprise risk management (ERM, as discussed in annex 2A of chapter 2) and Basel requirements.

Managers should easily recognize the flow of transactions (end-to-end processes) in their units. In other words, evaluating the control environment moves from *compliance* (with a board decision or a risk unit requirement) to use of the exercise as a *business tool* that both helps to manage the risks in their business units and serves as a staff training tool. From there, it should be easier for managers to identify the key risks and controls related to each of the 10 processes listed in table 13.2.

Management should also be challenged to *evaluate their own key controls* instead of leaving it to risk officers or auditors to ask the following questions:

- How *efficient* are my unit's controls, and can the results indicate which activities could be reengineered? Are the controls:
  - Manual
  - Automated
  - Preventive
  - Detective?
- Are the controls *effective* in ensuring:
  - Segregation of duties (same person not having access to both records and assets)
  - Automatic detection of a control failure (for example, through key performance indicators [KPIs] or key risk indicators [KRIs])
  - High probability of picking up a control breakdown?

Once that evaluation is done, the question to ask is, "*How will a senior manager know when a key control has failed*?" To answer the question, KRIs and KPIs should be linked to specific controls and business objectives.

Only at that point should management and outside evaluators proceed with an independent review of their opinions, usually as follows:

- Examining documentary evidence available
- Assessing the risk environment (to understand adequacy of controls)
- Determining whether the controls are designed effectively (a key responsibility of the risk function, the second line of defense)

Table 13.2 Expansion of ERM Model to Include Enterprise Functions Completing the Transaction Life Cycle, by Business Line

End-to-end processes	Risk evaluation and assessment activities
Strategy: Why am I in this business product or service line?	Key risks and risk classification
Governance and risk management	Key controls, linked to key risks
Product and services development	Key performance indicators (KPIs)
Infrastructure and capacity determination: • Human capacity • Technology capacity • Facilities capacity	Key risk indicators (KRIs)
Resource management	Efficiency of controls (objective: identify activities that could be reengineered as a business grows) • Manual • Automated • Preventive • Detective
New client take-on and portfolio setup	Is segregation of duties (person not having access to both records and assets) built into the control?
Deal execution and portfolio management	Would you automatically detect a control failure (through the use of KPIs or KRIs)?
Settlements and payments	Probability and materiality of control in failing to pick up a lapse, breakdown, or failure?
Accounting and reconciliations, valuation, and measurement	Overall evaluation by management of risk and control environment
Integrated performance, risk, and compliance analytics	Independent validation of management control evaluation
Each process should be subject to all risk evaluation activities	Management (in consultation with ERM and audit functions) • Is documentary evidence available? • Assess risk environment (for adequacy of controls) • Are process activities and controls **designed** effectively? (in conjunction with ERM function [second line of defense]) • Is control **operating effectively** as designed? (Evaluated by internal and external audit, after deciding whether control design allows reliance) • Is residual risk assessment **acceptable**?
	Description of residual risks identified (free format write-up)
	Overall rating used to compile overview of whole organization

Note: ERM = enterprise risk management.

- Determining whether the controls are operating effectively as designed (a key responsibility of the internal audit function and external audit), assuming that audit decides that they will be relying on the control in their assurance work
- Deciding whether their assessment of residual risk is acceptable and describing those residual risks. (Some approaches enforce a probability and materiality of residual risks, but this often results in a guessing game, of little scientific value.)

13.3 Documenting How Functions Are Performed

Identification of Business Line Functions and Activities

Two key questions determine which functions are required and useful for the transaction cycle: Why is a particular function necessary? And how does it contribute to achieving the business line's business objectives?

Once the key functions are determined, management must decide on actionable activities that will achieve functional objectives most efficiently. This process requires answering two questions:

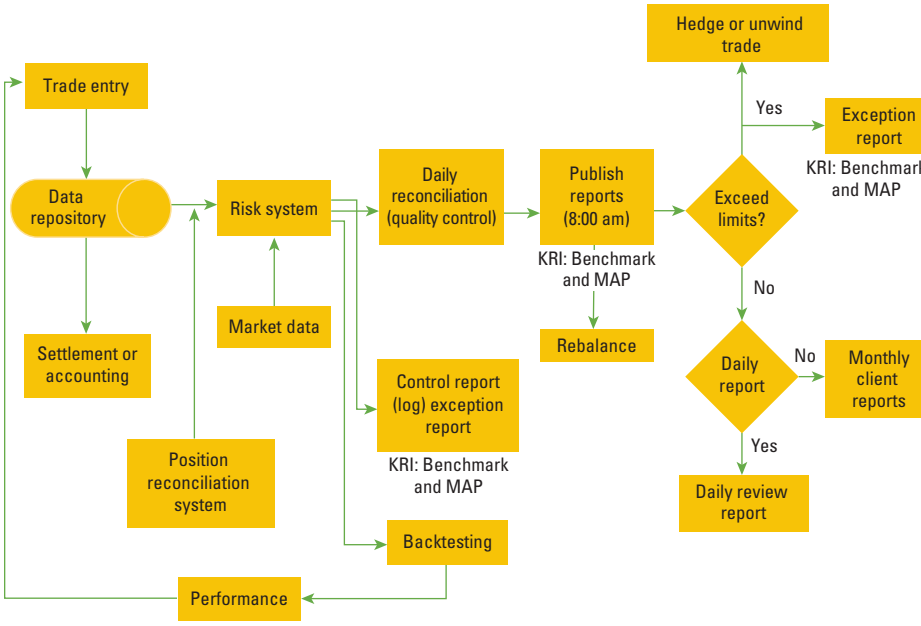
- What are the major functions performed during the life cycle of a transaction or a given business line?
- What activities are required to achieve each functional objective?

Some risk specialists disagree with the notion of mixing enterprise functions (such as strategy, governance, and general management) with line management and operational functions. However, it is clear that the lack of well-communicated strategy quickly leads to an organization that is not structured correctly for achieving its stated business objectives. That, in turn, will almost inevitably place staff career planning in jeopardy: resource allocation could be haphazard because any new idea that is proposed could take priority, to the detriment of achieving longer-term goals.

Mapping of Process Flows

The manner in which activities are performed exposes a bank to operational risk and inefficiencies. Management must select the technologies that are most likely to ensure optimal cost-effectiveness at the lowest possible risk exposure. To select the proper technologies, management must first determine the business rationale for performing functional activities, as follows:

Figure 13.1 Trade Process Flow from a Risk Analytics Perspective



Source: World Bank Treasury.

Note: KRI = key risk indicator; MAP = minimum acceptable performance.

- *What* business objectives are satisfied by performing the activities?
- *How* does the business perform the activities—that is, what is the process flow?

Mapping process flows provides a useful technique for visually identifying obsolete or inefficient steps, enabling banks to reengineer outdated processes. Figure 13.1 provides an example of the activities involved in processing a fixed income investment, using flowcharts.

13.4 Risk Assessment: Contributions of People, Processes, Systems, and External Events

There is sometimes a temptation, especially in treasury environments, to think of risk as being exclusively quantitative. Therefore, the challenge is to find a framework for the measurement of operational risk and governance that appeals to quantitatively oriented people and into which nonquantitative risk can be seamlessly integrated.

Risk is defined as anything that hinders the ethical achievement of sustainable business objectives and results. This includes the failure to exploit opportunities and to maintain organizational relevance. Every organization faces a variety of risks from external and internal sources that must be assessed.

Risk assessment is the identification and analysis of those risks that potentially jeopardize the achievement of business objectives. It forms a basis for determining how risks should be managed. A precondition to risk assessment is establishment of business objectives that are internally consistent and aligned with an organization's strategy and mission.

When undertaking a risk assessment, a bank must ask the following key questions regarding each function and its related activities (table 13.3):

- What are the drivers of risk (people, processes, systems, external events)?
- What risks are covered by the internal control framework?
- What are the information technology (IT) and systems risks?
- What are the information security risks?
- What are the risks related to business continuity?
- What are the risks related to facilities and location?
- What special risks may result from servicing external clients and complying with regulatory requirements?
- What are the additional risks from planning and implementing new products or projects?
- What else is bothering management?
- How likely is it that a risk will materialize?
- Where will the impact be felt?
- How badly will business be affected if risks do materialize, and will the impact be monetary, reputational, or related to compliance?

Once the risks have been identified, management must determine whether to accept the risks (if the low impact or likelihood of occurrence does not justify the expense of controlling them) or to mitigate the risks by avoiding, reducing, or sharing them.

Risk (and control) assessments normally work best when the questioning process is guided by an experienced neutral observer.

13.5 Control Assessment

Internal control is a process intended to provide reasonable assurance of achieving effectiveness and efficiency of operations, reliability of financial reporting, and compliance with applicable laws and regulations. This includes safeguarding assets.

Table 13.3 Risk Assessment: Questions for Each Functional Activity—Linked to Basel and ERM Models

Risk categories	Risk questions and response categories											
	What risks are covered by internal control framework?	What IT risks must be considered?	What information security risks must be considered?	What risks related to business continuity must be considered?	What risks related to facilities and location must be considered?	What special risks result from servicing external clients as well as complying with regulatory requirements?	New products? What additional downstream risks result from planning and implementing new products or projects?	What else is bothering management?	How likely is it that a risk will materialize?	How badly will it affect the business if risks do materialize?	Where will the impact be felt?	What is the response to the risks identified?
Basel event types	• Internal fraud • External fraud	• Business disruption and system failures	• Business disruption and system failures • Internal fraud • External fraud	• Business disruption and system failures • Damage to physical assets	• Damage to physical assets • Employment practices and workplace safety	• Clients, products, and business services	• Clients, products, and business services • Execution delivery and process management	• Execution delivery and process management				
Drivers of risk Operational risk definition	• People • External events	• Systems • External events	• People • External events • Systems	• External events	• External events	• People • Processes • Systems • External events	• People • Processes • Systems • External events	• People • Processes • Systems • External events				
Enterprise risk management, COSO model									• Likelihood	• Impact	• Monetary • Reputational • Compliance	• Avoid risk • Reduce risk • Accept risk • Share risk
Function Activities												

Note: COSO = Committee of Sponsoring Organizations of the Treadway Commission; ERM = enterprise risk management; IT = information technology.

Operational risk control processes and procedures should include a *policy compliance* system, including senior management reviews of progress toward the stated objectives, regular reporting for approved exceptions to thresholds or limits, review of the treatment and resolution of noncompliance incidents, and provisions for management overrides and other policy deviations.

An effective control environment also requires appropriate segregation of duties. Assignments that establish conflicting duties for individuals or a team without dual controls may enable concealment of losses, errors, or other inappropriate actions. Therefore, areas of potential conflicts of interest should be identified, minimized, and subject to careful independent monitoring and review.

The control environment sets the tone of an organization, providing discipline and structure. It includes integrity and ethical values, the competence of the staff, management's philosophy and operating style, the way management assigns authority and responsibility, the way management trains and develops staff, and the attention and direction provided by the board of directors. Policies and procedures are the control activities that help ensure that management directives are carried out and the organization achieves its objectives. Control activities—such as approvals, authorizations, verifications, reconciliations, reviews of operating performance, security of assets, and segregation of duties—occur throughout the organization, at all levels, and in all functions.

Controls can be either formal or informal. Formal controls include policy manuals, procedures, hierarchy, and regulations. Informal controls include ethics, competence, morale, trust, skills, leadership, processes, culture, information, resources, measurements, policies, communication, teamwork, and procedures.

When assessing a control process, management should address the following issues:

- Considering the business rationale and related risks, what is the risk management (control) objective?
- Who is responsible for monitoring this risk?
- What measures (key controls) are in place to achieve the risk management objective (for example, regular monitoring, accuracy, completeness, validity and correct period recorded, appropriateness, and classification)?
    - Is this control manual or automated?
    - Is this control preventive or detective?
- Who performs the risk management activity?
- Is there evidence (including from external parties or other divisions) that the control activity is routinely carried out?

- Is the effectiveness of any key control dependent on more than one individual or business unit?
- How does this risk management activity differ from current best market practice?

Usually management must satisfy its auditors that it has complied with its own stated risk management processes. One way of integrating compliance testing into routine management activities would be to require that any analysis or discussion of significant financial and risk trends and fluctuations, and any performance or reporting problems highlighted in quarterly financial reports, be linked to management's own description of its risk management procedures. Including the risk matrix as an agenda item in quarterly reporting would ensure that any changes to processes or risk management controls made during the financial reporting cycle are documented in a timely manner. Such reviews should also identify new risks and necessary changes to existing processes and internal controls.

13.6 Key Indicators of Performance and Risk

Managing operational risk requires identifying appropriate indicators of performance and risk. This requires collecting data (metrics)—internally and externally—that are representative of business processes. Such data are normally presented in relationship with a given frequency, such as wages per hour. When compared with an independent or previously agreed-upon benchmark, a metric becomes a risk or performance indicator.

Many operational risk managers choose not to define key performance indicators and key risk indicators separately. If one has to differentiate, one could begin by defining a *key performance indicator (KPI)* as a metric expressed in terms of a target (table 13.4). KPIs are seen as backward looking, describing past performance.

A *key risk indicator (KRI)* is defined as an operational or financial variable that provides a reliable basis for estimating the likelihood and the severity of one or more operational risk events. It can be a specific causal variable as well as a proxy for the drivers of the events and losses related to an operational risk. A KRI can be strictly *quantitative* (like the turnover rate in a business unit or the number of settlement errors) or more *qualitative* (like the adequacy of a system or the competence of personnel). It can be perfectly *objective* (like the number of hours of system downtime) or more *subjective* (like the overall complexity of a portfolio of derivatives).

Table 13.4 Comparison of Metrics and Indicators

Activity: confirm and settle transactions	Month 1	Month 2	Month 3
Trade volumes (use data mining)	1,000	1,100	900
Metric: number of errors (use data mining)	14	21	19
Benchmark or threshold (%)	1.5	1.5	1.5
Upper limit: immediate action required (%)	2.0	2.0	2.0
Trades with errors (%)	1.4	1.9	2.1
KPI: error rate (% of benchmark)	93.3	127.3	140.7
KRI: excess errors above benchmark (%)	–6.7	27.3	40.7
Risk factor relative to benchmark and upper limit of acceptability (acceptable to high concern)	1	2	3

Note: KPI = key performance indicator; KRI = key risk indicator.

But to be useful, a KRI will always have to be somehow linked to one of the risk drivers—or even better, to one of the mechanisms generating an operational failure. It follows that indicators have to be regularly reviewed and updated by discarding those that have become irrelevant or redundant, changing the way key data are collected and processed, and developing new indicators according to the evolution of the risk and the control environment.

KRIs are measurable indicators that track exposure or loss and show a status at a given point or, as one person put it, "trouble." Anything that can perform this function may be considered a risk indicator. Although credible KRIs are of utmost importance, managers should not spend endless hours trying to define them. Experienced risk managers advise that a risk indicator be defined and then used; if it is not appropriate, it will sort itself out over time and modifications can then be made.

KRIs may be financial indicators, but more often they are operational statistics that are combined and manipulated into KRIs and then included in an operational risk management report. The report informs the board of directors whether controls are operating effectively and whether trends in risk management remain within acceptable limits. Examples might include statistics on trading volumes, settlement errors, trade fails, and so forth.

Unlike KPIs (which look backward at past performance), KRIs look forward at potential risks. KRIs should be validated for different types (for example, exposure and control); different risk classes (people, technology, and processes); and for different units as well as treasurywide. KRIs should quantify all tangible and intangible aspects needed for risk-based decision making—that is, system failures, compliance, internal audits, turnover, and so forth.

A good KRI should have at least the following characteristics and abilities:

- Based on objective standards that are accepted by line managers and preferably having external benchmarks available
- Useful
- Easy to apply and be understood by the end users
- Developed using an objective and consistent methodology
- Providing a clear understanding of the risk variables underlying the indicator, such as the likelihood and impact of occurrence
- Containing advance warning features
- Quantifiable (numbers, dollars, or percentages)
- Tied to management objectives, risk owners, and risk categories
- Demonstrating clearly where problems might arise
- Timely and cost-effective to produce, using automated data mining techniques where possible.

KRIs are particularly useful in assuring senior management that the control framework is functioning as intended (and as documented). Business managers should identify KRIs for each control in their jurisdiction.

For example, if a metric such as the number of trade entry errors increases, the probability of some underlying and potentially systemic mistakes and errors of judgment is likely to rise. In other words, changes in the value of this metric above a predetermined threshold are likely to be associated with changes in operational risk exposure or operational loss experience. One can establish this point by determining who needs the information, what business or control objective-related question is being answered, why that specific metric is unique in answering the question, and which decisions are influenced or actions taken based on the KPI or KRI requiring this metric as input (table 13.5).

Management should determine what data are needed for developing indicators and how that data can be collected. The data collected should disclose a clear understanding of which risks management should be, and are, monitoring. The following questions should help management prepare operational risk reports cost-effectively:

- How does management know that it is meeting its business objectives (KPIs), and what is the target success rate (benchmark) aimed for by management?
- How does management know when risk management controls are not working as planned or the risk environment is deteriorating (KRIs)?

Table 13.5 Determination of Metrics for Inclusion as KPIs and KRIs within the Settlement and Payments Function

Function	Activity	Metric or statistic (unit or time scale of measurement)	KPI (metric as % of target)	KRI (metric as indicator of future risks)	Who needs this information?	What business or control objective question is answered by this metric? How is this metric linked to risk drivers?	Why is metric unique in answering business question?	Decisions influenced	Actions taken based on KPI or KRI	Data source	Frequency of collection
Settlement and payments	Confirm (validate) transaction, automatically update positions, and enter into settlement system										
	Make and receive payments (e.g., SWIFT)										
	Investigate transactions when necessary										
	Manage cash transaction flows and reconciliations										
	Maintain static data										
	Manage bank and custodian relations										

Note: KPI = key performance indicator; KRI = key risk indicator; SWIFT = Society for Worldwide Interbank Financial Telecommunication.

- Why are these aspects reflective of success or escalating risks?
  - Who needs this information?
  - What business or control objective question is answered by this metric?
  - How is this metric unique in answering business questions?
  - What decisions are influenced by these data?
  - What actions should be taken based on the KPIs and KRIs?
- How will data collection take place?
  - What data should be collected?
  - How often should data be collected?
  - Where can the data be found?
  - How should the data be collected?
  - Who will be responsible for collecting the data?

When designed properly and reported in a timely manner, risk and performance indicators provide a predictive warning of potential issues that may adversely affect the business. However, credible risk and performance indicators emerge only when risk managers fully understand the end-to-end operational flow of the business.

With a detailed mapping of the business process, a risk manager can design indicators that will yield the best information, based on high-quality metrics. For a practical way to map the business process, see Scandizzo (2007).

13.7 Operational Risk Reporting: Analysis, Actions, and Accountability

Well-structured management information, reviewed regularly as part of the governance process, will contribute significantly to the identification and management of operational risk. By linking operational risk management functions to KPIs and KRIs, management is provided with risk-based management information that focuses on risk management processes pertaining to each business line function and its related activities. The risk metrics include operational issues related to the trading activity, such as the monitoring of rate resets and other triggers on structured trades, settlement issues, and legal confirmations with respect to derivatives and debt service.

Analysis and Reporting of Internal Control Systems

Internal control systems need to be monitored, a process that assesses the quality of the system's performance over time through ongoing monitoring of activities and separate evaluations. Ongoing monitoring occurs in the course of

business and includes regular management and supervisory activities and other actions that staff may take in performing their duties. The scope and frequency of separate evaluations will depend primarily on an assessment of risks and on the effectiveness of the ongoing monitoring procedures.

Internal control deficiencies should be reported upstream as part of regular reporting to senior management. Identified deficiencies should, in turn, initiate analytical investigation of the reasons for fluctuations and errors to determine whether such occurrences are the result of new risks or the failure of existing risk management processes. This approach accepts risk management as a normal part of the management process, ensuring that risk assessment is not merely something that is performed once a year to satisfy some external reporting requirement.

Pertinent information must be identified, captured, and communicated in a form and within a time frame that enables people to carry out their responsibilities. Information systems produce reports containing the operational, financial, and compliance-related information that make it possible to run and control a business. They deal not only with internally generated data but also with the information about external events, activities, and conditions that is necessary for informed decision making and external reporting.

Effective communication must also occur in a broader sense—flowing down, across, and from the bottom. In a healthy control environment, communications are open. When a business objective is in jeopardy, bad news flows rapidly, enabling timely corrective action to be taken. All personnel must receive a clear message from top management that their control responsibilities must be taken seriously. They must understand their own roles in the internal control system as well as how their individual activities relate to the work of others. They must have a means of communicating significant information upstream. There also needs to be effective communication with external parties such as customers, suppliers, regulators, and shareholders.

An operational and enterprise risk dashboard should address key questions for management:

- Are any strategic, operational, reporting, or compliance objectives at risk?
- Which KRIs and KPIs or other matters require immediate action?
- Are all policies, limits, and laws complied with?
- Who should be accountable for actions required as a result of issues highlighted?
- Are key messages highlighted in the most efficient manner to convey critical information?
- Are required actions and accountabilities clearly conveyed?

The prototype operational risk report shown here (figure 13.2) is Excel based and can be used together with commonly available inexpensive software.

The foundation of the report is that a trend analysis should be performed on all KRIs, identifying significant fluctuations and asking the following four important questions:

- What has happened that draws attention?
- Why has it happened?
- What is the impact of the trend or situation?
- What actions need to be taken to reverse an unacceptable trend? Who is responsible for taking the action, and when should it be done?

It is important to avoid undue emphasis on control design and detailed testing rather than on evaluation of whether management is actually monitoring the impact of risks and controls. And how will we know the controls are functioning? Not through theoretical work but by analyzing trends in KPIs and KRIs and determining whether managers pay heed and act when unsatisfactory trends emerge.

It is not enough to analyze operational risk on a business line basis; one has to understand the life cycle of transactions within a business line, because the life cycle clarifies the various functions and activities required to manage a business line. Although this may seem natural because of the need to allocate responsibility and reward performance and good behavior, it will give a biased view of operational risk exposures and may even miss some of them altogether. In fact, failures in one part of the process can generate failures in others as well as materialize into losses within units that are organizationally separate, while being part of the same business line process.

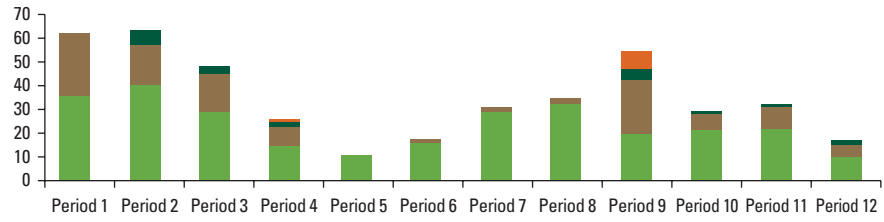
Some practitioners distinguish between "scorecards" and "dashboards." A scorecard presents risk or performance indicators focused on the *strategic* level, providing management with information regarding execution of strategic objectives. A dashboard (as in figure 13.2) contains performance indicators, risk indicators, and metrics—all focused on the *functional* level, such as settlements and control or accounting and valuation. To design a dashboard, background information must be easy to complete and must assist with the analytical standards required of a good dashboard (as in table 13.6).

Figure 13.2 Sample Operational Risk Management Report

Business Line # 1: Risk Report– ..... Date

Activity area # 8: settlements and control
Key risk and performance indicators–trends and charts

Transaction confirmation and settlement | Payments (SWIFT, etc.) | Investigations | Bank and custodian relations
Static data–maintenance | Cash management: flows and reconciliation | Cash accounting and control



Indicator and period	1	2	3	4	5	6	7	8	9	10	11	12	13	14
KRI 1														
KRI 2														
KRI 3														
KPI 1														
KPI 2														

1 & 2. What happened and Why

Indicator	Risk assessment/ Trend analysis	1. Description of what is happening.	2. Explanation of why trend is occurring
KRI 1	➡	Risk indicator not improving	
KRI 2	➡	Risk indicator staying on course	Change in institutional environment and nobody is paying attention to ….
KRI 3	⬇	Risk indicator worsening from already bad situation	
KPI 1	⬆	Worrisome performance indicator improving	
KPI 2	⬇	Performance indicator trend in wrong direction	

3. Impact of trends

Discuss the strategic business risk opportunities (in relation to the occurrence) that may be capitalized on within this aspect of the business line. Identify strategic goals for the next 1, 3, and 5 years.

4. Action to be taken by management

Risk	Residual risk	EXCO decision	Managerial accountability	Due date
KRI 1	Worrying situation and not improving	Resolve situation by next EXCO meeting	Director X	28 February
KRI 3	Bad situation and worsening	Immediate rectification	Director Y	15 February – 2 days from now
KPI 2	Good situation but negative trend, or opportunities not exploited	Action plan to be tabled at next EXCO meeting	Director Z	28 February

Note: EXCO = executive committee; KPI = key performance indicator; KRI = key risk indicator.

Table 13.6 Design of Dashboard-Style Input Table to Facilitate Analysis

Operational Report Design						
If metric is not automated: be critical						
Input information	**Time series**	**Chart types required**	**Analysis**	**Issues**	**Projects**	**Items to escalate to dashboard**
		Trend line Bar chart Pie charts	What happened? Why did it happen? What is the impact of the trends or events? What action should management take: date (original and revised), accountable senior manager	Description Action required	Description Action required	
KRI: by function						
KRI 1						
KRI 2 etc						
KPI: by function						
KPI 1						
KPI 2						
Benchmark: by indicator						
Target rate for each KPI						
Excess risk rate for selected KRIs						
Operational metrics: by activity						
Operational metric						
Operational metric						
Financial metrics: by activity						
Financial metric 1						
Financial metric 2						

Note: KPI = key performance indicator; KRI = key risk indicator.

Policies and Practices for Accountability

Public disclosure. A bank should have a formal disclosure policy approved by the board that specifies the approach for determining what operational risk disclosures it will make to stakeholders and the general public and the internal controls over the disclosure process. Public disclosure of relevant operational risk management information would allow stakeholders to assess the bank's approach to operational risk management and to conclude whether the bank identifies, assesses, monitors, and controls operational risk effectively.

The type and content of disclosure should be commensurate with the size, risk profile, and complexity of the bank's operations as well as evolving industry practice. The disclosure process and the content of disclosure information should be regularly reviewed and verified.

Information security. As discussed in chapter 15, information security has also become an important topic of operational risk management. The key objective is to minimize the likelihood and impact of information security incidents on the confidentiality, integrity, or availability of information assets, including information assets managed by related parties or third parties. The most important aspects are to

- Clearly define the information security-related roles and responsibilities of the board, senior management, governing bodies, and individuals;
- Maintain the entity's information security capability commensurate with the size and extent of threats to its information assets, and to enable the continued sound operation of the entity; and
- Implement controls to protect the entity's information assets commensurate with the criticality and sensitivity of those information assets, and undertake systematic testing and assurance regarding the effectiveness of those controls.

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14

Operational Risk Challenges

KEY MESSAGES

- Advances in financial technology (fintech) related to the internet and sophisticated software have increased the risk of criminal attacks on sector financial infrastructure and banking networks.
- Regulators and industry organizations have raised the awareness and guidance related to financial infrastructure resilience in the face of cybercrime.
- Cybersecurity and cybercrime require staff awareness in addition to policy frameworks and security firewalls.
- Logical and physical access to a bank's systems and data should be permitted only for individuals with legitimate business reasons.
- Technology and core banking software used by a bank also have an important impact on data quality.
- Data architecture consistency across banking business lines has proven difficult to achieve.
- Outsourcing is used when a shortage of specific skills (such as information technology skills) exists in the marketplace.
- Outsourcing creates dependencies without the traditional employer-employee relationship and needs to be carefully managed.
- Banks should be able to effectively manage the risks and challenge the quality and performance of all outsourced processes, services, and activities.
- To address money laundering, banks must develop policies and procedures in key areas such as customer acceptance, customer identification, ongoing monitoring of high-risk accounts, and risk management.
- The Financial Action Task Force (FATF) issued several revisions (from 2012 to 2019) of the "International Standards on Combating Money Laundering and the Financing of Terrorism and Proliferation" (commonly called the FATF Recommendations).

14.1 Financial Technology (Fintech)

Financial technology (fintech) refers to new processes, applications, products, or business models in the banking and financial services industry, covering one or more complementary financial services. Fintech also refers to an emerging industry based on information technology (IT) and innovation that facilitates the delivery of financial services and competes with the traditional financial methods and services.

Fintech focuses on innovative ideas by using these new technology solutions, which could also lead to new business models or even new businesses. The use of smartphones for mobile banking and investment services and cryptocurrency is an example of the innovative use of technology to make financial services more accessible to the general public. The services may originate from various independent service providers. The interconnection is enabled through open application programming interfaces (APIs) and open banking. Fintech also necessitates adequate infrastructures enabling efficient data collection, processing, and transmission (such as broadband internet, mobile data services, data repositories, and payment and settlement services).

Fintech companies include experienced, technology-oriented companies trying to replace, facilitate, or enhance the provision of financial services provided by the financial institutions. They also include start-ups introducing new applications or products.

Fintech is receiving increasing attention from entities of the international community that oversee the safety and stability of banking and financial markets. The rapid pace of fintech will necessitate improvements and extensions of regulatory and monitoring frameworks to maintain stability and to avoid disruptions to the financial system. Among those reviewing the implications of fintech developments are the Financial Stability Board (FSB), the Bank for International Settlements (BIS), the Basel Committee on Banking Supervision (BCBS), the Committee on Payments and Market Infrastructures (CPMI), the International Organization of Securities Commissions (IOSCO), and the International Association of Insurance Supervisors (IAIS). They have listed priorities and considerations for regulation and supervision, which provide useful insights for national authorities.

Fintech has also drawn the attention of development institutions, given the potential provided by the new technology to facilitate inclusion and improve access to finance and financial services in less developed parts of the world. The International Monetary Fund (IMF) and the World Bank developed the Bali

Fintech Agenda (published in 2018), including 12 elements that summarize the key considerations for policy makers and international communities (summarized in box 14.1).

BOX 14.1 The Bali Fintech Agenda

I. Embrace the Promise of Fintech with its far-reaching social and economic impact, particularly in low-income countries, small states, and for the underserved, and prepare to capture its possible wide-ranging benefits.

II. Enable New Technologies to Enhance Financial Service Provision by facilitating foundational infrastructures, fostering their open and affordable access, and ensuring a conducive policy environment.

III. Reinforce Competition and Commitment to Open, Free, and Contestable Markets to ensure a level playing field and to promote innovation, consumer choice, and access to high-quality financial services.

IV. Foster Fintech to Promote Financial Inclusion and Develop Financial Markets by overcoming challenges related to reach, customer information, and commercial viability, and by improving infrastructure.

V. Monitor Developments Closely to Deepen Understanding of Evolving Financial Systems to support the formulation of policies that foster the benefits of fintech and mitigate potential risks.

VI. Adapt Regulatory Framework and Supervisory Practices for Orderly Development and Stability of the Financial System, and facilitate the safe entry of new products, activities, and intermediaries; sustain trust and confidence; and respond to risks.

VII. Safeguard the Integrity of Financial Systems by identifying, understanding, assessing, and mitigating the risks of criminal misuse of fintech, and by using technologies that strengthen compliance with anti-money laundering and combating the financing of terrorism (AML/CFT) measures.

VIII. Modernize Legal Frameworks to Provide an Enabling Legal Landscape with greater legal clarity and certainty regarding key aspects of fintech activities.

IX. Ensure the Stability of Domestic Monetary and Financial Systems by considering the implications of fintech innovations to central banking services and market

box continues next page

BOX 14.1 The Bali Fintech Agenda *(continued)*

structure, while safeguarding financial stability; expanding, if needed, safety nets; and ensuring effective monetary policy transmission.

X. Develop Robust Financial and Data Infrastructure to Sustain Fintech Benefits that are resilient to disruptions––including from cyberattacks––and that support trust and confidence in the financial system by protecting the integrity of data and financial services.

XI. Encourage International Cooperation and Information Sharing across the global regulatory community to share knowledge, experience, and best practices to support an effective regulatory framework.

XII. Enhance Collective Surveillance of the International Monetary and Financial System and the adaptation and development of policies to support inclusive global growth, poverty alleviation, and international financial stability in an environment of rapid change.

Source: IMF and World Bank 2018.

14.2 Cyber Risk

The growth of the internet and the use of new information technologies provided innovative opportunities for banking and financial markets. Banks were able to improve the performance and efficiency of their standard services and to introduce new service platforms such as online banking, mobile payments, and settlement platforms. IT innovations helped to address some of the operational risks inherent in financial activities and services, especially related to operating errors and data management.

Nevertheless, the increasing complexity of information and computer technology also introduced new types of risks and new challenges for the effective operational risk management. The most typical risks related to information and computer technology include the following:

- *Data integrity risk*, when stored or processed data is incomplete or inaccurate, or the software or systems have inconsistency issues
- *Availability and continuity risk*, when the performance and availability of a bank's systems and data are adversely affected, including the inability to timely recover because of hardware or software failure or staff and management incompetence

- *Change risk,* when a bank cannot manage changes of its systems and business support in a timely and controlled manner
- *Outsourcing risk* related to engaging a third party, or intragroup outsourcing, to manage information and computer technology systems or provide the related services
- *Security risk,* due to unauthorized access to systems and data from within the bank or from outside.

Scope of Cyber Risk Vulnerability

Of these new types of risk, cyber risk—which falls into the security risk group—is especially challenging. Banks are highly exposed to cyber risk, given that they are IT-intensive and highly dependent on information sharing.

The broad range of entry points for malicious cyberattacks make them difficult to identify or fully eradicate and the breadth of damage difficult to determine. Cyberattacks could come through bank clients, through financial market infrastructure and its users, through service providers, or through information and computer technology products used. The cyber risk posed by an interconnected entity is not necessarily related to that entity's business relevance.

Moreover, certain cyberattacks can make some risk management and business continuity arrangements ineffective. For example, automated system and data replication arrangements designed as a backup to help preserve sensitive data and software in case of a physically disruptive event might in some instances fuel the propagation of malware and corrupted data.

Given the increasing challenges implied by cyber risk, the cybersecurity framework must be incorporated into the operational risk management framework and aligned with the bankwide risk management strategy. The inherent risk profile for cyber risk is based on technology used and connection types, online or mobile products and services, data organization and IT systems, and internal and external delivery channels. Hence, cyber risk management encompasses these main operational risk management categories:

- Governance and resilience framework
- Testing and access control
- Detection and protection
- Response and recovery.

The underlying aspects are testing, awareness, and learning and evolving.

Regulatory Initiatives

Given the increasing frequency, severity, sophistication, and cost of cyber incidents, cybersecurity concerns reached the top of the international regulatory and supervisory agenda. Numerous legislative, regulatory, and supervisory initiatives have been launched in the past few years to address cybersecurity and increase cyber resilience, including these major efforts at the international level:

- *The Group of Seven (G-7)* issued a set of principles on best practices, "Fundamental Elements of Cybersecurity for the Financial Sector" (CEG 2016).
- *The BIS's Committee on Payments and Market Infrastructures (CPMI)* issued, jointly with the International Organization of Securities Commissions, *Guidance on Cyber Resilience for Financial Market Infrastructures* (CPMI and IOSCO 2016).
- *The International Organization for Standardization (ISO)* issued the ISO/IEC 27000 family of standards on effective information security management.[1]

Because cybersecurity is a global issue, effective response requires cooperation not only at the international level but also at the national level and across sectors, well beyond the financial sector. To that end, the BCBS established the Operational Resilience Working Group (ORG) at the beginning of 2018 to contribute to the international effort related to cyber risk, in close coordination with other international bodies. The international Financial Stability Board reported that the need to mitigate the adverse impact of cyber risk on financial stability is among the top three priority areas for future international cooperation (FSB 2017).

Intense regulatory and practice initiatives are also present at the national level in many countries (including Israel, Switzerland, the United Kingdom, and the United States) where regulations and instructions on addressing cybersecurity have been introduced or are being developed. The national regulatory requirements typically follow the CPMI framework's risk management categories involving governance, identification, protection, detection, response, and recovery. However, there are differences regarding the approach: some prefer a principles-based approach, while others apply a more prescriptive framework.

Cross-sector cooperation is another important initiative, such as the 2004 establishment of the European Network and Information Security Agency (ENISA)—since renamed the European Union Agency for Cybersecurity. At the national level, a good example is the Financial Stability Oversight Council

(FSOC) in the United States, which aims to improve cooperation between sectors related to the financial sector, such as the utilities or telecommunications sectors.

On the other hand, although banks and regulators agree that the existing guidance provides a good set of high-level principles that can serve as building blocks for enhancing cybersecurity, a common challenge reported by industry stakeholders is the diversion of time and resources spent on "box ticking"—that is, compliance exercises with sometimes redundant or contradictory regulations—instead of effectively building up and maintaining their resilience capabilities. The diversity of national cybersecurity institutional setups and the varying maturity of sector initiatives also pose challenges in designing effective policies, in a context where the system is only as strong as its weakest link.

14.3 Key Aspects of Cyber Risk Management

Cyber governance. As with other forms of risk faced by a bank, sound governance is the key aspect of cyber risk management. Cyber governance refers to a bank's arrangements to establish, implement, and from time to time reevaluate its approach to managing cyber risks.

Effective cyber governance should include a clear and comprehensive cyber resilience framework that clearly defines the roles and responsibilities of the bank's board and its management and prioritizes the security and efficiency of bank operations. Effective communication between the board of directors and management, including both the senior and the operational level management, is critical for the board to effectively exercise its oversight and internal control responsibilities. A bank's business culture should emphasize that staff at all levels, as well as its interconnected service providers, have important responsibilities in ensuring cyber resilience. In some jurisdictions, regulators are insisting on a board-level committee to deal with IT (including cyber risk aspects).

Cyber resilience framework. The cyber resilience framework should clearly articulate cyber resilience objectives and cyber risk tolerance as well as the processes and methodologies that a bank will use to effectively identify, mitigate, and manage its cyber risks. The framework should also ensure the ongoing efficiency, effectiveness, and economic viability of the bank's services to its clients. This implies effective security controls and system and process design that protect the confidentiality, integrity, and availability of the bank's assets and services.

Many relevant international, national, and industry-level standards, guidelines, or recommendations could be used as benchmarks in designing a bank's cyber resilience framework. Given the dynamic nature of cyber risks, the framework should evolve to enable effective management of changing cyber risks.

The bank's board should endorse the cyber resilience framework while ensuring that it is aligned with the operational risk management strategy. The adequacy of and adherence to the cyber resilience framework should be measured regularly through independent compliance programs and external audits carried out by qualified individuals. Bank management should aim to instill a culture of cyber risk awareness and demonstrate ongoing reevaluation and improvement of the bank's cyber resilience posture at every level within the organization.

Cyber resilience should also be an important consideration during system, process, and product design from the ground up. A process to instill "resilience by design" should ensure that (a) software, network configurations, and hardware supporting or connected to critical systems are subject to rigorous testing against the related security standards; (b) attack surfaces are limited to the extent practicable; and (c) common information security principles relating to confidentiality, integrity, and availability are adhered to.

Testing. All elements of the cyber resilience framework should be regularly and carefully tested to determine their effectiveness and to identify vulnerabilities and gaps against the stated resilience objectives. Typical tests related to cyber resilience are scenario-based testing and penetration tests:

- *Scenario-based testing* is expected to address a broad scope of scenarios—including simulation of extreme but possible cyberattacks—and should be designed to challenge the assumptions of response, resumption, and recovery practices, including governance arrangements and communication plans.
- *Penetration tests* normally focus on identifying vulnerabilities that may affect a bank's systems, networks, people, or processes. These tests should simulate attacks on the bank's systems to provide a credible basis for an in-depth evaluation of the systems' cybersecurity. A bank should actively monitor IT and other technological developments and keep abreast of the new cyber risk management aspects that can effectively counter existing and newly developed forms of cyberattacks. Penetration tests on internet-facing systems should be conducted regularly and whenever the systems are updated or the bank's software and information and communication technology systems are changed.

Access control. Cyber resilience depends on effective security controls that protect the confidentiality, integrity, and availability of a bank's assets and services. Only authorized individuals should have logical and physical access to the bank's systems and data, and this authorization should be limited to individuals with legitimate business requirements, who are appropriately trained and monitored. A bank should establish strong controls over privileged system access by strictly limiting and closely supervising staff with elevated system access entitlements. Screening and background checks should be repeated for all staff at regular intervals throughout their employment, at the level that is in line with staff's access privileges to critical systems and to changing responsibilities. Detailed screening should also be established for new employees.

In certain aspects, cybersecurity is less about technology and more about people. Raising cybersecurity awareness among bank staff should be an important component of protecting the bank from cyber risk. A bank must focus on raising the cybersecurity awareness of all staff, in particular helping frontline personnel to understand the value of the assets they use every day.

Information systems and data inventory. A bank should establish and systematically maintain an inventory of all information assets and system configurations that support all its business functions and processes, including interconnections with other internal and external systems and entities. The inventory should be subject to regular risk assessment and its elements classified in terms of criticality. The information available in the systems and data inventory (with details about the access rights to information and business developments) would facilitate identification and investigation of suspicious or abnormal activities.

A bank should also address risks arising from interconnectivity and introduce protective measures to mitigate this risk. The appropriate controls for each entity will depend on the risk that arises from the connected entity and the nature of the relationship with the entity.

Change management. The change management process should be comprehensive and explicitly consider cyber risks—those identified both before and during the change process as well as any new cyber risks created after the change. Change management should be aligned with other relevant processes (such as identification efforts, new design, and development and acquisition) to facilitate regular review of the bank's list of critical business processes, functions, and individual and system credentials as well as its inventory of information assets so that they remain current, accurate, and complete.

Detection capacity. An ability to detect anomalies and events indicating a potential cyber incident is essential to strong cyber resilience. Early detection provides useful lead time to create countermeasures against a potential breach and allows proactive containment of actual breaches. Given the stealthy and sophisticated nature of cyberattacks and the multiple entry points through which a compromise could take place, advanced capabilities to extensively monitor for abnormal activities are needed. A bank should also design and test its systems and processes to enable the safe resumption of critical operations within a reasonable time frame after disruption.

Top-down approach. Initiatives to improve cyber risk management and the cybersecurity framework tend to be focused, starting from the top. At the national level, authorities identify critical financial infrastructure elements and larger banks and financial institutions that are forced to promptly implement the respective national cybersecurity frameworks. Banks are expected to have a consistent approach for their banking group (headquarters, subsidiaries, and branch networks). Ideally, the entire bank should be protected, but given limited resources, banks should target where to deploy their resources, prioritizing their cybersecurity efforts on systems and data that contain critical information assets or support the key business functions. Legal and regulatory requirements related to systems and data protection are the usual starting points for the bank to decide on critical assets.

14.4 Information Governance: Risk Data Aggregation

Information Technology and Databases

The quality of a bank's financial and other information critic°ally depends on the IT systems used. A bank's IT must address a set of technical prerequisites, operational challenges, complex data volumes, and security concerns. The "core banking" system is a major investment for a retail bank, and maintaining and managing the system can represent a large part of the cost of running a bank. Many banks currently use core banking software developed and maintained by specialized vendors. In addition to core banking software, there are software tools such as financial asset trading platforms, financial risk management packages, and reporting and information management systems, to name a few.

Core banking software is used to record and manage the transactions made by customers to their accounts. It is used by millions of users across hundreds or thousands of branches. It is expected to allow a customer to go to any branch of

the bank or to use other channels such as automated teller machines (ATMs), internet banking and mobile phone (short message service [SMS])-based banking. This means that the software must be interconnected and managed on many machines, even in a small bank. This is a significant challenge.

The key point is that the bank governance structure and management, as well as its supervisory authorities, need to ensure that the IT systems, databases, and software tools meet the bank's requirements and applicable regulatory and prudential norms; that they have an adequate backup in case of crash or problems; that they adequately support financial risk management requirements; and that they are well maintained and regularly updated to address all possible issues and, if possible, use the latest IT advances.

Risk Data Aggregation

IT and data architecture are the key factors supporting management of financial risks. The postcrisis analysis concluded that the 2007–09 global financial crisis occurred, to a large extent, because of inadequate IT support, inconsistent data architecture, and bad interconnectivity. Many banks lacked the ability to timely aggregate risk exposures at the group level, with many entities and business lines as well as inadequate reporting practices. To address the systemic implications and prevent future crisis situations, the BCBS issued supplemental Pillar 2 (supervisory review) guidance—emphasizing that a sound risk management system should have appropriate management information systems (MIS) at the business and bankwide level—as well as a new common data template for global systemically important financial institutions (BCBS 2009).

Another important development was the BCBS 239, which provides a set of principles for effective risk data aggregation and risk reporting. The term "risk data aggregation" means defining, gathering, and processing risk data according to the bank's risk reporting requirements to enable the bank to measure its performance against its risk tolerance or appetite. This includes sorting, merging, or breaking down sets of data. These principles, issued in January 2013, are intended to facilitate reporting of key information, particularly for board and senior management; improve decision-making processes by enhancing exchange of key information across legal entities and at the global or consolidated level; increase the speed of access to information to facilitate decision making; and improve strategic planning and the ability to manage risks related to new products and services.

The definitions appear deceptively general and cover four topics: (a) governance and infrastructure; (b) risk data aggregation capabilities; (c) risk reporting practices; and (d) supervisory review, tools, and cooperation. Box 14.2 summarizes the 14 principles defined in BCBS 239.

BOX 14.2 BCBS Standard 239: Risk Data Aggregation and Risk Reporting

Principle 1. Governance: Risk data aggregation capabilities and risk reporting practices should be subject to strong governance arrangements consistent with other principles and guidance established by the BCBS. A bank's board and senior management should promote the identification, assessment, and management of data quality risks as part of its overall risk management framework. The framework should include service level standards for both outsourced and in-house risk-data-related processes and a firm's policies on data confidentiality, integrity, and availability as well as risk management policies.

Principle 2. Data architecture and IT infrastructure: A bank should design, build, and maintain data architecture and IT infrastructure that fully support its risk data aggregation capabilities and risk reporting practices, not only in normal times but also during times of stress or crisis, while still meeting the other Principles.

Principle 3. Accuracy and integrity: A bank should be able to generate accurate and reliable risk data to meet normal and stress/crisis reporting accuracy requirements. Data should be aggregated on a largely automated basis so as to minimize the probability of errors.

Principle 4. Completeness: A bank should be able to capture and aggregate all risk data across the banking group. Data should be available by business line, legal entity, asset type, industry, region, and other groupings, as relevant for the risk in question, that permit identifying and reporting risk exposures, concentrations, and emerging risks.

Principle 5. Timeliness: Aggregate and up-to-date risk data should be generated in a timely manner, with accuracy and integrity, completeness and adaptability. The timing depends on the nature and potential volatility of the risk being measured, importance for the bank's overall risk profile, and the frequency

box continues next page

BOX 14.2 BCBS Standard 239: Risk Data Aggregation and Risk Reporting *(continued)*

requirements for risk management reporting, under both normal and stress/crisis situations.

Principle 6. Adaptability: Reporting capacity should cover a broad range of on-demand, ad hoc risk management reporting requests, including during stress/crisis situations, requests due to changing internal needs, and requests to meet supervisory queries.

Principle 7. Accuracy: Reports, reconciled and validated, should accurately and precisely convey aggregated risk data and reflect the risk profile.

Principle 8. Comprehensiveness: Reports should cover all risk areas with the depth and scope consistent with the size and complexity of the bank's operations and risk profile as well as the requirements of the recipients.

Principle 9. Clarity and usefulness: Risk management reports should be clear and concise, easy to understand, yet comprehensive enough to facilitate informed decision making. Reports should include meaningful information tailored to the needs of the recipients.

Principle 10. Frequency: Frequency requirements should reflect the needs of the recipients, the nature of the risk reported, and the speed at which the risk can change, as well as the importance for sound risk management and decision making across the bank. The frequency of reports should be increased during times of stress or crisis.

Principle 11. Distribution: Risk management reports should be distributed to the relevant parties while ensuring confidentiality.

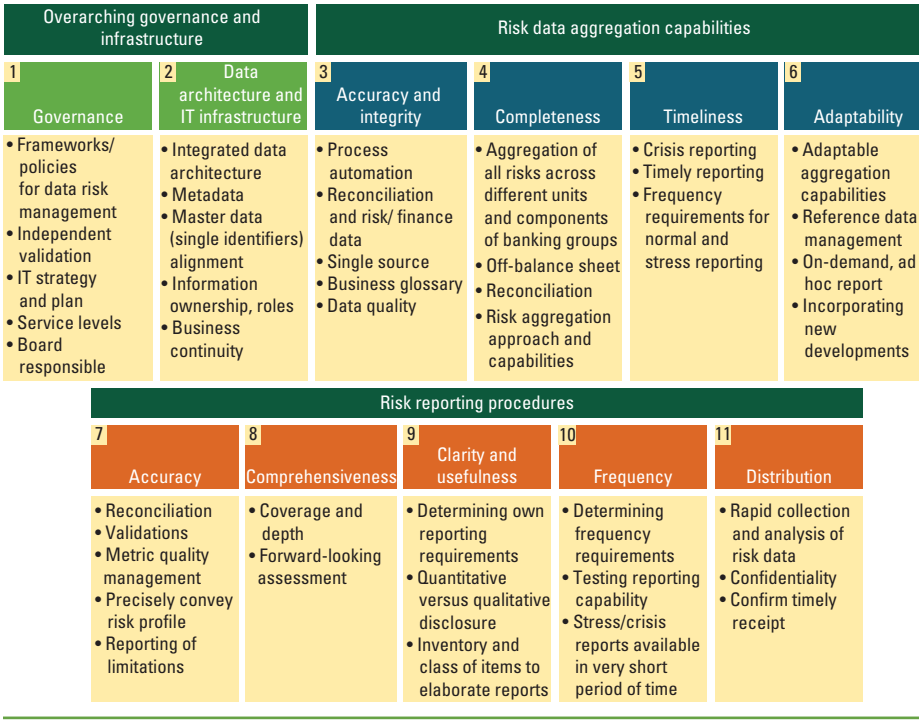
Principle 12. Review: Supervisors should periodically review and evaluate a bank's compliance.

Principle 13. Remedial actions and supervisory measures: Supervisors should have the ability to use a range of tools and resources to require effective and timely remedial action by a bank to address deficiencies in its risk data aggregation capabilities and risk reporting practices.

Principle 14. Home/host cooperation: Supervisors should cooperate with relevant supervisors in other jurisdictions.

Source: BCBS 2013.

Figure 14.1 Overview of BCBS 239: Information Governance



Source: Elize van der Linde, FirstRand Bank.

Note: BCBS = Basel Committee on Banking Supervision. Figure excludes Principles 12–14 relating to supervisory review.

These principles can be visually displayed, as in figure 14.1, which has been used to inform nonexecutive directors of the work required in implementing and achieving the objectives of BCBS 239. (The figure excludes Principles 12–14, which relate to supervisory review responsibilities.)

Implementation Challenges

Challenges faced by banks when implementing data aggregation principles occur mostly because of technical issues, such as the following:

- *Difficulties in design, implementation, and management* of complex and large-scale IT and data infrastructure projects
- *Incomplete integration and implementation* of bankwide data architecture and frameworks (such as data taxonomies, data dictionaries, and risk data policies)

- *Weaknesses in data quality controls* (such as reconciliation, validation checks, and data quality standards)
- *Overreliance on manual processes and interventions* to produce risk reports, although some manual processes are unavoidable.

Although most banks are expected to achieve full compliance in two to three years, the risk of not meeting the expected date of full compliance remains a concern. International organizations and supervisory authorities in most countries are putting increasing pressure on banks to enhance efforts toward full compliance with BCBS 239 principles as soon as possible. Banks are expected to provide clear road maps including a timeline for closing compliance gaps, with expected deliverables and addressing of deficiencies being observed by their supervisory authorities, and dedicated resources and oversight being provided by board and senior management.

Ethical Use of Data

Pedro Uria Recio—a thought leader in artificial intelligence, data analytics, and digital marketing—states the following (Uria Recio 2018):

> The scale and ease with which data analytics can be conducted today completely changes the ethical framework. We can now do things that were impossible a few years ago, and existing ethical and legal frameworks cannot prescribe what we should do. While there is still no black or white, experts agree on a few principles:
>
> 1. *Private customer data and identity should remain private.* Privacy does not mean secrecy, as private data might need to be audited based on legal requirements, but that private data obtained from a person with their consent should not be exposed for use by other businesses or individuals with any traces to their identity.
> 2. *Shared private information should be treated confidentially.* Third-party companies share sensitive data—medical, financial, or locational—and need to have restrictions on whether and how that information can be shared further.
> 3. *Customers should have a transparent view* of how our data is being used or sold and [have] the ability to manage the flow of their private information across massive, third-party analytical systems.
> 4. *Big data should not interfere with human will.* Big data analytics can moderate and even determine who we are before we make up our own minds. Companies need to begin to think about the kind of predictions and inferences that should be allowed and the ones that should not.

5. *Big data should not institutionalize unfair biases like racism or sexism.* Machine learning algorithms can absorb unconscious biases in a population and amplify them via training samples.

A March 2019 joint paper by KPMG and UK Finance stated the problem as follows: "If financial institutions lose their status as trusted custodians of customer data, they may well lose their licence to operate. In mainstream financial services, all forms of institutions are increasingly coming to understand the liabilities associated with data ownership and the use of autonomous technologies. While the amount of coverage in these areas has increased recently, for financial institutions the reality is that the ethical use of customer data has been a focus for some time."

Governance over this area can be achieved at the audit, risk, or ethics committee level. One example of how an audit committee has included governance of information in its agenda has been to focus on three major areas—namely, *accuracy of data*; *privacy of data* (to demonstrate that customer data are treated carefully and ethically); and *security of data*. This leaves the remaining aspects in figure 14.1 to be covered by risk or IT governance committees.

14.5 Outsourcing

Financial institutions are continuously adapting their business models, processes, and systems to take advantage of the opportunities provided by new IT. At the same time, effective use and management of continuously changing information technology and systems is a serious challenge, and getting experienced IT specialists is an even bigger challenge.

Consequently, there is an increasing trend to engage a third party, or intragroup outsourcing, for management of information and computer technology systems and provision of the related services to reduce costs and improve efficiency and system flexibility. Outsourcing to cloud-based service providers has also gained importance in many industries. Outsourcing is, increasingly, not limited to IT-related services.

Regulatory Initiatives

Given the increasing issues with outsourcing and the frequency of the related cyber incidents, outsourcing has drawn increasing interest from regulatory and supervisory authorities in the past few years. Multiple regulatory and supervisory initiatives have addressed the operational risk related to outsourcing, with some differences in focus and rules.

Most often mentioned are the institutions in charge of advising and coordinating banking regulation and supervision in the European Union—initially the Committee of European Banking Supervisors, replaced in 2011 by the European Banking Authority. They published outsourcing guidelines to establish a proper framework for outsourcing arrangements of all financial institutions and specify the criteria for assessing whether an outsourced activity, service, process, or function (or part of it) is critical or important (CEBS 2006). These guidelines were updated in 2018 and further revised in 2019 to further harmonize institutions' governance arrangements, processes, and mechanisms (EBA 2019).

The national regulatory and supervisory authorities have also started to focus on the outsourcing risk management issues. For example, the Swiss Financial Market Supervisory Authority issued multiple circulars on outsourcing, adopting a principle-based approach to materiality and an increasing emphasis on financial institutions' self-assessment responsibilities.

Governance

Governance remains the key aspect in dealing with outsourcing. Banks must remain able to oversee all operational risks and to manage outsourcing arrangements. Institutions should be able to effectively manage the risks of all outsourced processes, services, and activities. Before entering into outsourcing arrangements, senior management should ensure establishment of an appropriate framework for outsourcing—including all elements and related implementation and application in a group, the due diligence processes, and risk assessment and management aspects.

The senior management body's responsibilities for the outsourcing process must be clearly defined in a bank's policies and procedures, including aspects related to the contractual arrangements, the monitoring and documentation of outsourcing arrangements, and the supervision by competent authorities. The outsourcing framework should include the due diligence process ensuring that banking functions and services are outsourced only to reliable service providers, hence ensuring the ongoing provision of services and compliance with regulatory requirements. Audit and access rights must be ensured in written outsourcing agreements for the bank and supervisory authorities.

Related Management Considerations

Inventory. The bank should maintain a register of all outsourcing arrangements with an up-to-date inventory of all outsourced functions. Such an inventory must include proper descriptions of each of the outsourced functions, detailed information about the service provider and any subcontractors, all details about the service and risk management aspects, and the designation of responsible organizational units within a bank.

Selection, instruction, and supervision of service providers. Service providers should be selected based on financial and personal resources, as well as their professional skills, while also considering potential concentration risks when outsourcing multiple functions to the same service provider. The service provider must guarantee continuous service provision and adequate capacity to manage risk for all outsourced banking functions. Before signing the outsourcing service agreement, the bank should do the following:

- Document in full detail its requirements regarding the service provision
- Analyze and document the potential financial and economic or service opportunities and possible operational risks
- Appraise the capacity of the outsourced service provider and potential risks.

14.6 Money Laundering

Money laundering is defined as an attempt to conduct financial transactions whereby the object of a financial transaction consists of the proceeds of some unlawful activity, with an ultimate objective of making the "dirty" money appear "clean."

The first step is to find a way to get illegitimate funds into the financial system. The funds are then moved around, typically using numerous transactions and transferring them through several accounts to get the funds accepted within the financial system. Money laundering can also facilitate crimes (such as drug trafficking and terrorism) as well as tax evasion and therefore have a negative impact on the economy.

Regulatory Initiatives

Attention to money laundering originated in the United States, which in 1956 introduced regulations defining money laundering as domestic and international transactions where funds or monetary instruments are transmitted as undercover

transactions, locally or internationally, while concealing or avoiding reporting requirements. For a financial institution, "transaction" is defined as a deposit; withdrawal; transfer between accounts; loan; exchange of currency; extension of credit; purchase or sale; or any other payment, transfer, or delivery by, through, or to a financial institution. The initial anti-money laundering (AML) legal framework in the United States has been updated eight times. In the later updates, AML legislation also included *combating the financing of terrorism* (CFT) aspects.

Money laundering prevention has also received increasing attention internationally. The BCBS issued its first guidelines in 1988. During the 1990s, it became increasingly focused on addressing money laundering issues. In its *Customer Due Diligence for Banks*, issued in 2001, the BCBS set standards and provided prudential guidance for customer due diligence (BCBS 2001). Customer due diligence requires adequate due diligence on new and existing customers—in other words, banks must develop policies and procedures in key areas such as customer acceptance, customer identification, ongoing monitoring of high-risk accounts, and risk management.

By 2003, these efforts were joined by International Association of Insurance Supervisors (IAIS) and International Organization of Securities Commissions (IOSCO) supporting the adoption of standards to address money laundering-related risks (Joint Forum 2003). Revised guidelines were published in 2005 and again updated in 2014. The latest version was published in 2016, as an annex to the guidelines published in 2014.

In 1989, the G-7 established the Financial Action Task Force (FATF), an intergovernmental organization to develop policies to combat money laundering. In 2001, its mandate expanded to include terrorism financing. These efforts created numerous prudential regulations, risk management standards, and operational risk management requirements related to AML/CFT measures. The FATF regularly issues revised versions (2012 through 2018) of some of the standards contained in the "International Standards on Combating Money Laundering and the Financing of Terrorism & Proliferation" (called the FATF Recommendations) to support national implementation of these standards.

The FATF Recommendations set out the essential measures that countries should have in place to do the following:

- Identify the risks and develop policies and domestic coordination
- Pursue money laundering, terrorist financing, and the financing of proliferation
- Apply preventive measures for the financial sector and other designated sectors

- Establish powers and responsibilities for the competent authorities (for example, investigative, law enforcement, and supervisory authorities) and other institutional measures
- Enhance the transparency and availability of beneficial ownership information of legal persons and arrangements
- Facilitate international cooperation.

In addition to the 40 primary recommendations (box 14.3), the FATF issued eight "Special Recommendations" in October 2001 (adding a ninth in 2004) to deal with the issue of terrorist financing.

BOX 14.3 FATF 40 Recommendations

Recommendation 1: Assessing risks and applying a risk-based approach*

Recommendation 2: National cooperation and coordination

Recommendation 3: Money laundering offense*

Recommendation 4: Confiscation and provisional measures*

Recommendation 5: Terrorist financing offense*

Recommendation 6: Targeted financial sanctions related to terrorism and terrorist financing*

Recommendation 7: Targeted financial sanctions related to proliferation*

Recommendation 8: Nonprofit organizations*

Recommendation 9: Financial institution secrecy laws

Recommendation 10: Customer due diligence*

Recommendation 11: Record keeping

Recommendation 12: Politically exposed persons*

Recommendation 13: Correspondent banking*

Recommendation 14: Money or value transfer services*

Recommendation 15: New technologies

Recommendation 16: Wire transfers*

box continues next page

BOX 14.3 FATF 40 Recommendations *(continued)*

Recommendation 17: Reliance on third parties*
Recommendation 18: Internal controls and foreign branches and subsidiaries*
Recommendation 19: Higher-risk countries*
Recommendation 20: Reporting of suspicious transactions*
Recommendation 21: Tipping-off and confidentiality
Recommendation 22: DNFBPs: Customer due diligence*
Recommendation 23: DNFBPs: Other measures*
Recommendation 24: Transparency and beneficial ownership of legal persons*
Recommendation 25: Transparency and beneficial ownership of legal arrangements*
Recommendation 26: Regulation and supervision of financial institutions*
Recommendation 27: Powers of supervisors
Recommendation 28: Regulation and supervision of DNFBPs
Recommendation 29: Financial intelligence units*
Recommendation 30: Responsibilities of law enforcement and investigative authorities*
Recommendation 31: Powers of law enforcement and investigative authorities
Recommendation 32: Cash couriers*
Recommendation 33: Statistics
Recommendation 34: Guidance and feedback
Recommendation 35: Sanctions
Recommendation 36: International instruments
Recommendation 37: Mutual legal assistance
Recommendation 38: Mutual legal assistance: freezing and confiscation*
Recommendation 39: Extradition
Recommendation 40: Other forms of international cooperation*

Source: FATF 2019.
Note: DNFBP = Designated Non-Financial Business or Profession; FATF = Financial Action Task Force.
* Recommendations marked with an asterisk have interpretive notes, which should be read in conjunction with the Recommendation.

The FATF special recommendations cover the following areas:

- Ratification and implementation of United Nations instruments
- Criminalizing the financing of terrorism and associated money laundering
- Freezing and confiscating terrorist assets
- Reporting suspicious transactions related to terrorism
- International cooperation
- Alternative remittance
- Wire transfers
- Nonprofit organizations
- Cash couriers.

AML also received the attention of global banking institutions. In 2000, the 13 largest global banks established an association (the Wolfsberg Group) to develop the framework and guidance for management of financial crime-related risks, particularly with respect to Know Your Customer[2] and AML/CFT measures.

The objectives of these policies and procedures were to prevent the use of a bank's worldwide operations for criminal purposes and to protect its reputation. They were designed to mitigate money laundering risk and facilitate cooperation with governments and their agencies in the detection of money laundering.

14.7 Managing the Risks Related to Money Laundering

Assessment and Understanding of Anti-Money Laundering and Combating the Financing of Terrorism (AML/CFT) Risks

Sound risk management requires identification and analysis of AML/CFT risks within the bank and the design and effective implementation of policies and procedures that address the identified risks. In conducting a comprehensive risk assessment to evaluate AML/CFT risks, a bank should consider all relevant risk factors at the country, sector, and business relationship level. There are many ways to conduct the AML risk assessment, and a bank needs to select its methodologies based on a number of factors, such as its size, organization, the risk profiles of its markets, and its risk appetite. For an AML risk assessment to be successful, senior management, along with the key stakeholders, should provide appropriate support to the effort in the context of fostering a robust culture of compliance.

The key purposes of an AML risk assessment are to determine the risk profile and identify the specific AML risks that the bank is facing, to appraise how these risks are mitigated by its AML procedures and controls, and to establish the level and the profile of the residual money laundering risks. The results of the AML risk assessment can be used to

- *Identify gaps or opportunities for improvement* in a bank's AML policies, procedures, and processes, and to develop the AML risk mitigation strategies, including the appropriate internal controls to reduce the residual AML risk exposure;
- *Assist management* in ensuring that resources and priorities are aligned with its AML risk profile and ensure that senior management are made aware of the key AML risks, control gaps, and remediation efforts so they can make informed decisions related to AML risks.

Undertaking a bankwide AML risk assessment is a complex, resource-intensive task but nonetheless a necessary one to understand a bank's AML risk environment. The periodicity of the bankwide AML risk assessment depends upon several factors, including the methodology employed, the type and extent of interim validation or verification processes that are undertaken regularly, the results of the risk assessment, and internal or external AML risk events.

Financial institutions should decide on the appropriate frequency of their AML risk assessments to maintain the relevance of their findings and of the AML risk mitigation program. Some institutions execute AML risk assessments annually, but if there are no material changes to the risk environment, some may undertake their risk assessments less often. However, in some circumstances, the AML risk assessment should be conducted more frequently than annually. Ad hoc assessments focusing on high-risk areas may also be performed as needed. Regardless of the frequency of risk assessment, banks are usually required to report annually to their supervisory authorities on the status of their AML risk environment. In exceptional circumstances, more frequent reporting may be required.

Governance and Control for AML Management

Proper governance and control arrangements are critical for effective AML risk management. The board should have a clear understanding of AML and terrorist funding risks. The board or senior management should appoint

a qualified chief officer to have overall responsibility for the AML function with the stature and the necessary authority to make sure that issues raised by this senior officer receive the necessary attention from the board, senior management, and business line managers. Policies and procedures should specify standard controls to be undertaken by the various "control layers" (line management, independent operations unit, compliance, internal audit) and specify areas such as frequency, degree of control, areas to be controlled, responsibilities, follow-up, and compliance testing.

Lines of Defense

A general standard for AML/CFT risk management amounts to three lines of defense:

- *The first line of defense* falls to the business units (such as the front office and customer-facing activity) in charge of identifying, assessing, and controlling the money laundering risks. They should know and carry out the related policies and procedures and have sufficient resources to do this effectively.
- *As the second line of defense,* the bank must establish an adequately staffed and independent department responsible for AML management including preventive measures.
- *The third line of defense* is the internal audit function. External auditors may also have an important role to play in evaluating banks' internal controls and procedures in the course of their financial audits and in confirming that they are compliant with AML/CFT regulations and supervisory practice.

An additional defense is regular training (such as annually) on money laundering identification and prevention for employees who have client contact and for compliance personnel, including details on how to identify and follow up on unusual or suspicious activities.

Adequacy of the Transaction Monitoring System

Ongoing monitoring is an essential aspect of effective and sound AML/CFT risk management. A bank can only effectively manage its risks if it understands the normal and reasonable banking activity of its customers, hence enabling it to identify attempted and unusual transactions that fall outside the regular pattern of the banking activity.

Bank monitoring systems must correspond to the bank's size, business coverage and complexity, type and range of activities, and risk profile. For most banks, especially those that are internationally active, effective monitoring is likely to necessitate the automation of the monitoring process. In some countries, banks are allowed to rely on customer due diligence performed by third parties, such as other financial institutions or designated nonfinancial businesses and professions that are themselves supervised or monitored for AML risk.

Groupwide Customer Risk Management

Consolidated risk management means establishing and administering a process to coordinate and apply policies and procedures on a groupwide basis, thereby implementing a consistent and comprehensive baseline for managing the bank's risks across its international operations.

Policies and procedures should be designed not merely to comply strictly with all relevant laws and regulations but more broadly to identify, monitor, and mitigate groupwide risks. Every effort should be made to ensure that the group's ability to obtain and review information in accordance with its global AML/CFT policies and procedures is not impaired as a result of modifications to local policies or procedures necessitated by local legal requirements.

14.8 Customer Due Diligence Management

A bank should have well-defined customer acceptance policies and procedures aiming to identify the types of customers likely to pose higher AML/CFT risks. Customer due diligence should be applied not only to customers but also to persons acting on their behalf and to beneficial owners. A bank may also define acceptable exceptions, with the review procedures requiring risk assessment by a specialized independent unit followed by senior management approval.

Client Acceptance Process

AML policies should specify acceptance only for clients whose sources of funds (and wealth) can be reasonably confirmed to be legitimate. The acceptance process should typically include the following steps:

- *Establish identity,* in line with bank policy, of clients and beneficial owners before establishing business relationships.
- *Verify identity,* subject to applicable local requirements. A natural person's identity is typically verified on the basis of official identity papers or

other reliable source documents, data, or information. Identity for corporations, partnerships, and foundations should be verified on the basis of legal documentary evidence, including the details regarding organization and operations. Documents used for verification purposes must be current at the time of review.

- *Establish beneficial ownership* for all accounts. Beneficial owners may include individuals who have ultimate control through ownership or other means over the funds in the account or who are the ultimate source of funds for the account and whose source of wealth should be subject to due diligence, as follows:
  - *For individuals,* the bank must determine whether the client is acting on his or her own behalf; otherwise, on whose behalf the account holder is acting; and whether an enhanced due diligence review is needed.
  - *For legal entities* (including companies, trusts, partnerships, foundations, and so on), the bank must understand the entity's organization and structure and determine who is the provider of funds, the beneficial owner(s) of the assets, and who has the power to give direction to company's senior management. Identity should be verified to the bank's satisfaction on the basis of official identity papers or other reliable, independent source documents, data, or information, as may be appropriate under the circumstances.
- *Understand and properly document the identity of the holder of a power of attorney* or another authorized signer, if different from the beneficial owner of the account.

Higher-Risk Client Acceptance: Enhanced Due Diligence Measures

Prohibited customers. Bank policies should specify categories of customers that the bank will not accept or retain.

Customers requiring enhanced due diligence. This is the case when a customer is generally acceptable but likely to pose a higher than average risk to the bank. Indicators implying enhanced due diligence include the following:

- *Clients residing in or having funds sourced from countries* having inadequate AML standards or implying high risk for crime or corruption
- *Clients engaged in types of economic or business activities* or sectors known to be susceptible to money laundering

- *Politically exposed persons* who have senior or prominent public positions with substantial authority over policy, operations, or the use or allocation of government-owned resources (for example, senior government officials and senior executives of government corporations, as well as their close family and close associates).

A new client who is subject to a higher AML risk approval process should be approved by at least two persons from different organizational units.

Greater scrutiny requirements. Clients who are not deemed to warrant enhanced due diligence may be subjected to greater scrutiny as a result of monitoring of their activities, external inquiries, or other factors that may expose the bank to additional or reputational risk. Senior management approval may be needed for certain types of customers, and bank policies should define when the senior management approval is needed to establish a relationship with a client.

Walk-in clients and electronic banking relationships. Banks should have a policy specifying whether walk-in clients or relationships initiated through electronic channels require a higher degree of due diligence before account opening.

Applying an AML risk-based approach, the bank should specifically address measures to satisfactorily establish and verify the identity and client profile category of non-face-to-face customers on the basis of documentary evidence or reliable sources. Unless these measures are reasonably sufficient to confirm the client's due diligence (such as favorable and reliable references), the client must be met in person before account opening, at which time, if identity is verified on the basis of official identity documents, such documents should be reviewed.

Relationships with intermediaries. The nature of the bank's relationship with an intermediary depends on the type of intermediary involved. In any case, using an intermediary implies that its clients become the bank's clients.

The bank should generally obtain the same type of information for an introduced client as for its original clients. The bank's policies should address to what extent the bank may rely on the intermediary in obtaining this information. A managing intermediary could act as a professional asset manager for its client and either (a) be authorized to act in connection with its account (in which case the additional due diligence review, as noted above, would be necessary); or (b) be itself the account holder with the bank, to be treated as the client of the bank. The private banker will perform due diligence and establish,

as appropriate, that the intermediary has relevant due diligence procedures for its clients, or a regulatory obligation to conduct such due diligence, that is satisfactory to the bank.

Special Accounts

Numbered or alternate-name accounts. Such accounts should only be accepted if the bank has established the identity of the client and the beneficial owner. These accounts must be open to a level of scrutiny by the bank's appropriate control layers that are at least equal to the level of scrutiny applicable to other client accounts. Wire transfers from these accounts must reflect the account holder's true name.

Concentration accounts. Bank should not permit the use of its internal nonclient accounts (sometimes referred to as "concentration" accounts) to prevent association of a client's identity with the movement of funds on the client's behalf. In other words, the bank will not permit the use of such internal accounts in a manner that would prevent the bank from appropriately monitoring the client's account activity.

Unusual or Suspicious Activities

The bank must define policies and procedures covering unusual and suspicious activities, including the following:

- *Written policy* on the identification of and follow-up on unusual or suspicious activities, such as pass-through or in-and-out transactions or transactions exceeding certain amounts
- *Identification* of unusual or suspicious activities transactions through monitoring, client contacts (meetings and discussions), or third-party information (such as internet, newspapers, and other media sources)
- *Analysis and follow-up* on unusual or suspicious activities (by a private banker, management, or the AML department)—the final decision on which could be to continue the business relationship with increased monitoring, to cancel the business relationship, or to report the business relationship to the authorities—and, as required by local laws and regulations, blocking the assets and subjecting transactions to approval by the control function
- *Specific cash handling policies and procedures* to address cash transactions concerning the receipt or withdrawal of large amounts of cash.

Updating Client Files

Policies and procedures should define the details and frequency of updates and reviews depending on the size, complexity, and risk posed by the relationship. Files must be updated regularly (or when there are major changes) and reviewed by the control function to ensure consistency and completeness. For clients requiring additional diligence, reviews must involve senior management. The policies and procedures should address the frequency of these information flows.

Notes

1. For more information, see "ISO/IEC 27000 Information Security Management," ISO website: https://www.iso.org/isoiec-27001-information-security.html.
2. Know Your Customer refers to customer due diligence standards concerning verification of customers' or clients' identity, often in connection with bank regulations and anti-money laundering regulations.

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15

Overview of Operational Risk Management Functions and Activities in a Treasury Environment

KEY MESSAGES

- A treasury policy framework should include a list of eligible instruments and their derivatives and specify rules pertaining to allowable counterparties, currencies, and maturity structures.
- Treasury information technology (IT)-supported functions must be closely aligned with treasury operations.
- Treasury staff must have a full understanding and appreciation of the cybersecurity framework and cyber resilience.
- Performance and risk management and measurement are crucial functions.

15.1 Establishing the Overall Policy Framework

Before beginning any funding, market operations, or risk management activities, senior management decides on policies governing the various treasury functions. Typically, the board of directors or a delegated senior committee specifies the types of funding and investments in which a bank might engage. The authorization thus issued normally would include a list of eligible instruments and their derivatives and would specify rules pertaining to allowable counterparties, currencies, and maturity structures. These general policy directives may also specify the principles underlying the asset-liability management of the balance sheet and may authorize the use of an external asset management firm for managing the bank's investments.

Responsibility for the establishment and maintenance of a control framework (risk management framework) and the list of officers authorized to transact on behalf of the bank normally is specified in internal guidelines. Unlike corporate policy, which should be approved by the board of directors, these operational guidelines may be approved at a treasury or investment policy committee level.

Because financial markets are constantly changing, it is imperative that policy guidelines be reviewed regularly.

15.2 Portfolio Management: Market Operations

Financial intermediaries must necessarily transform the duration (interest rate exposure) of their liabilities to different interest exposures on the asset side of the balance sheet. At the same time, intermediaries must be able to meet their commitments (such as deposits or bond repayments) when they come due or are called. The actual inflow and outflow of funds will not necessarily be reflected in contractual terms and may vary according to market conditions. A financial intermediary therefore is inherently exposed to liquidity mismatches. Consequently, liquidity policies and liquidity risk management are key elements of its business strategy. (The importance of managing liquidity risk is more fully discussed in chapter 8.)

Access to cost-effective funding for the bank's treasury can be influenced by interest rates and the spread environment, by the activities of competitors in the market, by demand for credit, by a bank's credit rating, and by the local environment (for example, the availability of arbitrage markets). The structure of a bank's funding is a key aspect of liquidity management.

A bank with a stable, large, and diverse deposit base is likely to have fewer liquidity problems than one lacking such a deposit base. Therefore, the starting point for liquidity risk assessment is an assessment of the structure and type of deposit base and the evaluation of the condition (stability and quality) of the deposits. The following information is necessary to assess the funding environment:

- Product range
- Deposit concentration
- Deposit administration
- Funding structure
- Approach to potential sources of funding.

With respect to borrowings, management should ensure that the funding risks are properly managed. Unauthorized transactions or changes (that is, those without proper management approval or those made by unauthorized staff) could cause potential financial and reputational risks for the bank. Transaction information that is not captured correctly or promptly—especially when complex funding structures such as index-linked bonds and swaps are used—could result in settlement delays or failures, and the poor timing of transaction execution may cause opportunity costs. Inappropriate behavior on the part of employees (for example, favoring certain counterparties) or imperfect execution could also cause potential monetary losses and harm to the bank's reputation.

From an operational risk perspective, some funding structures require manual intervention during the life of the instrument because treasury computer software may be unable to capture the required rates or intervention triggers. Where derivatives are used as a part of the funding structure, transactions executed in excess of the counterparty's credit line limit would increase exposure. Incorrect determination of derivative parameters—such as notional amounts, periodic coupon cash flows, dates, and day count conventions—also can cause potential financial losses.

15.3 Investment and Cash Flow Management

In a commercial banking environment, the investment and trading process assists in smoothing short-term liquidity shortfalls and surpluses to maximize returns with minimum cash balances and to provide cash flows to all internal and external clients. The investment function also manages longer-term assets as a contingent source of liquidity while earning a reasonable return on the investment portfolio. (Management of liquidity and other investment portfolios is discussed in chapter 9 and market risk management in chapter 10.)

Because the risk profiles of different classes of instruments can differ markedly, individual portfolio managers normally take responsibility for subportfolios in different asset classes and of differing maturity profiles. A complicating factor in the investment management process arises when a bank requires collateral from counterparties (for example, for swaps). The calculation and secure management of such collateral usually involves a custodian, which requires a mechanism to ensure accurate computation and record-keeping capacity.

15.4 Use of External Asset Managers

Bank boards of directors may sometimes authorize outsourcing the management of a specific percentage of liquid assets or investments to try to obtain a higher portfolio return or to secure a transfer of technology. The use of external managers is an effective way to obtain professional management of a bond portfolio while a bank is building internal capacity.

External service providers for management of liquid assets should be selected based on service capacity and technical skills. The selected provider must guarantee continuous service provision and adequate capacity to manage risk for all outsourced functions and activities. The treasury should maintain a register with proper descriptions of all outsourced functions, detailed information about the service provider, and all details regarding the risk management aspects.

It is important to recall, however, that at least 90 percent of the risk and return of the portfolio will come from the selection of the benchmark (through the strategic asset allocation process); no more than 10 percent is likely to come from active management by external managers. To avoid any negative surprises, it is therefore critically important that management understand the differences in expected risk and return from different benchmarks and that the benchmarks selected for external managers have acceptable risk and return attributes. In addition, it is essential to determine how much risk external managers will be permitted, compared with the benchmark. This can be expressed in terms of an acceptable level of underperformance as measured in basis points of return.

Before embarking on an external manager program, there are important steps to take:

- Determine the selection criteria and the selection process
- Determine the benchmarks and risk limits to be incorporated into the investment management agreements
- Determine the fee basis (that is, flat versus performance fees)
- Establish performance review and criteria (for example, tracking error, Sharpe ratios) for firing managers
- Monitor the manager's compliance with risk limits
- Arrange payment of management fees
- Establish service requirements for training.

Bank management may outsource targeted amounts in stages to enable evaluation of how well the external managers are fulfilling their mandate. Knowing that the size of their mandate could be increased could also be an important incentive for the external managers to do well.

15.5 Treasury Back-Office Operations

Management of the treasury operations function has become increasingly complex with changes in the financial markets, regulatory requirements, and technology.

Risk in this area is considered to be the highest when manual interventions take place. The management response has been a focus on automation of the activities of recording and settling trades—called "straight-through" processing. Automation of the treasury operations function focuses a significant portion of the risk on the market operations activity where electronic inputs are made, necessitating greater control over the payment approval and release function, including enhanced control over the confirmation of transactions and the reconciliation of bank accounts at other institutions (nostro accounts).

In recent years, many traditional treasury operations functions have been outsourced, but those that often remain in the treasury are as follows:

- Cash management
- Banking relations
- Settlement of trades
- Accounting, valuation, and reporting for treasury activities (asset-liability management, funding, and investing).

15.6 Settlement of Trades

Settlement risk is the risk that settlement in a transfer system will not take place as expected because one party defaults on its clearing obligations. A default on settlement leads to both credit (counterparty) and liquidity risk. The best way to mitigate settlement risk is clearly to have a safe and efficient payment system.

The settlement function must ensure the proper settlement of transactions executed by the portfolio management and funding sides of the treasury. The role of settlement staff is to minimize the operational risk associated with the settlement process by strictly adhering to stated controls. To summarize, the settlement function must do the following:

- Ensure that all transactions are confirmed (verbally or through the Society for Worldwide Interbank Financial Telecommunication [SWIFT]) on a timely basis
- Ensure that all payments are made accurately and in a timely manner
- Ensure that all receipts are recorded accurately and in a timely manner
- Ensure that all securities are delivered and received accurately and in a timely manner
- Maintain all standard reference and static data, such as standard settlement instructions, authentication and test keys between banks, and customer information files (including phone and telex or fax numbers, bank contacts, and addresses).

All failed transactions must be monitored and followed up until resolved. Lack of notification regarding failed transactions can prolong the exposure to financial and reputational risk. All failed transactions should be communicated to the trading floor because a lack of communication between settlement staff and traders about fails will prevent the teams from exploring ways to eliminate avoidable failed transactions in the future.

Risks associated with the settlement function include the following:

- Transactions may be improperly entered in the trading system software. Inaccurate or incomplete trade entry could result in settlement, accounting, financial reporting, and valuation errors.
- Actionable events (reset triggers, reset rates, or other "ticklers") may be missed, resulting in errors in interest accruals, cash flows, settlement, accounting, financial reporting, and valuation.
- Derivative (legal) documentation between the bank and its counterparties may not be executed and finalized, creating possible differences in the understanding of trade details.

15.7 Cash Management and Banking Relations

The major objectives of the cash management and banking relationship functions are to optimize cash planning and to facilitate the straight-through processing of funds. To achieve these objectives, staff in these areas must ensure the timely processing of payments and receipts, provide an efficient correspondent banking infrastructure, foster a high customer service level for client investigations, and minimize the operational risk associated with cash processing by following through on outstanding and suspense items.

Following are some of the risks associated with this dual function:

- Unauthorized instructions for transfers may occur if access to terminals is not strictly enforced.
- Transactions can be delayed or rejected if data are not entered in the system correctly.
- Loss and misappropriation of funds or fraud may occur as a result of improper unauthorized changes to SWIFT messages.
- Checks may be misplaced, deposited to a wrong account, or not deposited at all.
- Delivery of funds to the wrong account can delay receipt of funds by the rightful beneficiary. This creates a reputational risk and may result in monetary claims for late delivery.
- Delivery of payment to the incorrect beneficiary will result in loss of funds should those payments prove unrecoverable.
- Discrepancies in value date, mismatching, and human error may result in inaccurate data and therefore incorrect cash reconciliations.
- Incorrect cash positions may be reported to trading floor cash managers, resulting in potential financial losses to the bank.

15.8 Accounting and Reporting of Treasury Activities

Accurate record keeping is crucial in risk management, especially for the treasury function. A sound record-keeping system should keep track of transactions on a trade-date basis and should maintain all supporting information. Postings to the general ledger and memorandum accounts should originate with and be reviewed by persons who lack the authority to execute transactions. Ledgers should be reconciled frequently with the respective account statements and confirmations held by the staff executing the transactions. Record keeping should be subject to internal audit on a regular basis.

The role of the accounting function in treasury operations is to measure treasury results and reflect them in the financial statements and supporting reports. Accountants must ensure the accuracy of any market data used in valuations and generate any accounting entries required by generally accepted accounting practice, such as the adjustment of financial assets and liabilities to fair values.

These are challenging requirements, as they require the treasury accounting function to field a full complement of personnel who are trained not only

in the accounting function but also in the substance of the various trading and derivative products. The challenge is compounded by the fact that the essential investment data typically must be sourced from many different systems, and few of these systems provide reports that could be described as user friendly. Consequently, some management information reports must be prepared manually, with the attendant risk of data integrity errors. One way in which treasury operations managers attempt to address multiple data sources is by relying on integrated operational databases, or "data warehouses," from which management reports can be customized.

To ensure the consistency of data and reporting sources, the accounting function also may be split into two areas: one for pure reporting and the other for reconciling key data and reports produced by different systems. The two areas involve different activities.

Accounting-related activities include the following:

- Ensuring that accounting is set up to accommodate new business requirements and products in a timely manner
- Performing daily accounting data review and control for all portfolios
- Reviewing performance reports for all portfolios as an additional validation and control of accounting information
- Reviewing new and changed trades
- Reviewing profit and loss accounts
- Preparing regulatory reports
- Reviewing accounting entries, especially manual ones.

Reconciliation activities include

- Reconciling data from different systems for accuracy, completeness, and agreement;
- Reconciling the accounting system with the custodian system to ensure that all securities are accounted for (a "custodian" being a financial institution that keeps custody and records of a bank's or other institution's securities); and
- Ensuring that all manual entries are appropriate.

15.9 Quantitative Strategies

The primary objective of a quantitative strategies function is to help strengthen the investment processes by increasing the use of analytical

tools and techniques and by conducting quantitative modeling and research. Quantitative strategies apply to the disciplines of strategic asset allocation and market analysis. The quantitative strategies function also conducts financial modeling for the benefit of the bank's investment, liquidity, funding, and asset-liability management businesses. In major banks, this function supports external clients or even other asset managers.

Models and analytical tools are used to support risk management decision making at the day-to-day business level as well as strategic risk/reward decision making at the portfolio level. Because it is essential that the data used for modeling are consistent and reliable, the modeling function should be responsible for ensuring that the infrastructure by which data are centralized is adequate.

The responsibilities of the quantitative strategies function include the development and production of monthly market analysis charts, the tracking and dissemination of the market views and sentiment indicators of market strategists and participants, and the systematic synthesis and dissemination of investment research and views. These analyses should be performed internally by economists and financial analysts and externally by market and industry experts. For this function to be credible, it must develop and maintain extensive relationships with external quantitative market strategists working at broker-dealers as well as with pension fund managers and asset managers.

15.10 Model Validation

Implementation of models and handling of any system changes are operational risk issues. Improper use of a model or using incorrect data with a model exposes an entity to significant operational risk.

Validation of the models used in the treasury environment is raised as a policy issue to ensure that the analyst is aware of the importance of segregating the responsibility for model development and usage from the checking and validation of such models.

15.11 Risk Measurement

Risk measurement and risk management focus on providing a disciplined approach to risk control in portfolio management. The objective of the function is to provide an independent assessment of the market risks being taken across the various treasury businesses. This assessment is for the benefit of risk budget decision makers (traders) as well as management. The risk factors

normally covered by market risk measurement include interest rates, exchange rates, equity prices, and commodity prices.

Risk measurement requires the periodic computation of risk positions (daily, monthly, quarterly). It normally provides daily risk reporting to the portfolio managers to assist in their investment decisions and to support periodic benchmark rebalancing. It therefore benefits the risk decision makers by providing them with feedback on their positions and by facilitating the determination of future positions. Management in turn uses the outputs of the risk analytics and compliance function to monitor the risks being taken across the various business lines and to ensure compliance with established guidelines.

A prerequisite of the risk measurement function is to ensure that all securities are properly valued (that is, marked to market). This is achieved by mapping investments to an appropriate pricing source. Proper pricing will lead to accurate measurement of total returns and performance.

Because the models used to assess the risks on treasury businesses are often run on a variety of systems, and in some cases by third-party vendors, the risk measurement function should take responsibility for managing the complex array of risk systems and vendors. To maintain their knowledge of best practice and leading-edge technologies and techniques, staff working in this area should maintain extensive relationships with the vendors of risk management and measurement systems as well as with their market counterparts, such as pension fund and asset managers, and with broker-dealers and other industry experts.

15.12 Performance Measurement and Analysis

The objective of performance measurement is to determine the total return of the benchmark and the total return of the portfolio, and to report the results to management.

Performance analysis (and attribution) is the process of decomposing the total return or cost of a portfolio into a series of primary risk factors, quantifying the extent to which key risk decisions (such as sector allocations, security selection, and benchmark or manager risk) have contributed to portfolio performance. This can be done on either an absolute or a relative basis (that is, versus an index).

The objective of the performance analysis function is to develop tools and methodologies capable of measuring the contributions to performance of different levels of decision making. The goal is to have models that assess and attribute performance on an absolute basis and also relative to benchmarks,

thus providing a basis for refining and improving the decision-making process. Performance attribution both contributes to and facilitates the development of the risk budgeting and risk management frameworks.

15.13 Performance and Risk Reporting

Accurate and timely reporting is essential to support decision-making processes and to support the monitoring of a treasury's performance in pursuit of its objectives. Risk-based reporting thus is a critical part of investment management and portfolio risk management.

A risk reporting team should have a library of standard reports to evaluate the key performance and risk statistics needed for the assessment of investment and funding decisions. It should also have the necessary tools for ad hoc, in-depth analysis.

Portfolio reports must deliver information that is both adequate and timely enough to enable portfolio managers to evaluate their portfolio risk and size their positions to remain within a tolerable risk level. This information should include performance and risk measures such as duration, sensitivity, value at risk, and yield curve risk.

Each functional area should be responsible for its own reports. For example, daily compliance and risk reports should be produced respectively by the compliance and risk management teams. Daily performance reports for a fixed-income portfolio (and monthly performance and attribution reports) may be generated by the treasury operational unit in collaboration with the performance attribution function. Responsibility for regular and ad hoc market-related reports may be assigned to a quantitative strategies function. Where information from multiple functional areas in a treasury is presented in a joint report, the risk analytics and compliance unit's role should be to coordinate the preparation and ensure the consistency and timely production of the report.

15.14 Compliance

The purpose of the compliance function is to ensure that all treasury transactions and business activities comply with appropriate laws, regulations, policies, guidelines, and ethical standards. A strong compliance function is an important cornerstone to counterparty and client confidence that the treasury function will act appropriately and in their best interests. It is important that

the monitoring of compliance with investment, borrowing, swap authorities, and other guidelines be centralized for an entire banking group and its asset management clients.

Additional areas of responsibility of the compliance function include:

- Participating in due diligence meetings with external service providers and asset managers to ensure they have the capacity to assess compliance with given guidelines
- Assisting in drafting guidelines that are measurable and consistent
- Designing portfolio management policies for treasury portfolios—for example, trading limits, selection of vendors, procedures, reporting requirements, and introduction of new financial instruments
- Liaising with both the internal and external auditors
- Assisting in the development of a treasury code of ethics.

The compliance staff must monitor compliance with guidelines and report exceptions; they must also work internally with colleagues and externally with counterparties to remedy infractions and prevent their recurrence. A mature compliance function will be able to assist with the development of treasury systems infrastructure and to participate in data quality meetings with colleagues from treasury operations and other areas.

15.15 Technology Support, Security, and Business Continuity (IT)

Although the IT function may be housed outside of the treasury, systems security requirements would necessitate that the treasury IT function be closely aligned with treasury operations. In whatever unit IT is located, it should provide the systems mechanism and infrastructure to support treasury activities. The primary success indicator of the IT function is the ability of the treasury to participate competitively in financial markets without suffering financial losses due to systems-related problems.

The IT specialist in a treasury has to provide trading floor and accounting systems capable of capturing in real time all market data, from all providers, that are needed to value any type of financial instrument. Market data should be retrievable for repricing, reporting, historical analysis, and other purposes, and the treasury systems should support trade maintenance applications, including automated rate resetting, money market rollovers, and other repetitive tasks.

The main risks and difficulties facing the treasury IT specialist include the following:

- *High dependence on outside vendors.* The lack of the necessary IT skills within the organization usually results in outsourcing of the activity.
- *"Scope creep."* Documentation of user requirements for system development projects may be threatened by the tendency of users to make changes well into the implementation phase.
- *Inconsistent reporting from a centralized database.* The production of official reports can involve numerous workflow procedures, raising the risk that data—translated into different spreadsheets using different calculation routines—will be altered.
- *Inadequate information security of data, workstations, and application systems.* The IT industry is advancing too quickly for most treasury security teams to keep pace, and the risks of virus attacks and break-ins are increasing.
- *An inadequate disaster recovery facility.* Particularly in remote locations, there is a risk that business continuity could not be sustained during a major systems failure.
- *Dependence on outsourcing of hardware and systems management.* External standards of support may not be as stringent as those maintained internally.
- *Difficulty of maintaining support of application systems that use diverse development software.* Rapid IT advances expose legacy systems to the inevitable danger that market expertise will become increasingly hard to find.

16

Transparency and Data Quality

KEY MESSAGES

- Accounting information has to be useful. Relevance, reliability, comparability, and understandability are attributes of useful information.
- Financial statements should strive to achieve transparency through the fair presentation of useful information.
- International Financial Reporting Standards (IFRS) contain sufficient disclosure requirements to ensure fair presentation. IFRS standards are regularly updated to reflect changes in international financial markets and meet potential user needs.
- Perceived deficiencies in financial reporting standards often relate to inadequate enforcement of and nonadherence to existing standards.

16.1 Introduction: The Importance of Useful Accounting Information

The provision of transparent and useful information on market participants and their transactions is an essential part of an orderly, efficient market as well as a key prerequisite for imposing market discipline. For a risk-based approach to bank management and supervision to be effective, useful information must be provided to each key player. These players (as discussed in chapter 2) include supervisors, current and prospective shareholders and bondholders, depositors and other creditors, correspondent and other banks, counterparties, and the general public. Left alone, markets may not generate sufficient disclosure. Although market forces normally balance the marginal benefits and costs of disclosing additional information, the end result may not be what players really need.

Banking legislation traditionally has been used to force the disclosure of information. However, legally mandated disclosure has focused on the provision of prudential information required by bank supervisors and the compilation of statistics for monetary policy purposes rather than the provision of information that enables a comprehensive evaluation of financial risks. Nevertheless, the availability of such imperfect information has improved the functioning of markets.

The financial and capital market liberalization trends of the 1980s brought increasing volatility to financial markets and consequently increased the need for good-quality information to ensure meaningful assessment of financial stability—resulting in the ongoing formulation of minimum disclosure requirements by accounting standard setters. These requirements address the quality and quantity of information that must be provided to market participants and the general public. The provision of information is essential to promote the stability of the banking system, and regulatory authorities have made the improvement of information quality a high priority. Banks are also encouraged to improve their internal information systems to develop a reputation for providing quality information.

In the 1990s, the changing structure of financial intermediation further strengthened the case for enhanced disclosure. The increasing use of financial instruments to transfer risk have contributed to the role of markets and market prices in the allocation of capital and have changed the risk profiles in the financial system. This shift has also affected disclosure requirements: to make informed choices, investors need sound information about the profile and nature of risks involved.

The public disclosure of information is predicated on the existence of quality accounting standards and adequate disclosure methodology. The process normally involves publication of relevant qualitative and quantitative information in annual financial reports, which are often supplemented by biannual or quarterly financial statements and other important information. Because the provision of information can be expensive, its usefulness for the public should be weighed against cost when setting the obligatory disclosure requirements.

Timing is also important. Disclosure of negative information to a public that is not sufficiently sophisticated to interpret it could damage a bank—and possibly the entire banking system. In situations where the disclosed information is low in quality, or when users are not deemed capable of properly interpreting what is disclosed, public requirements should be carefully phased in and progressively tightened. In the long run, a full-disclosure regime is

beneficial, even if some immediate problems are experienced, because the cost to the financial system of not being transparent is ultimately higher than that of revealing information.

16.2 Transparency and Accountability

"Transparency" refers to creating an environment where information on existing conditions, decisions, and actions is made accessible, visible, and understandable to all market participants. "Disclosure" refers more specifically to the process and methodology of providing the information and of making policy decisions through timely dissemination and openness. "Accountability" refers to the need for market participants, including the relevant authorities, to justify their actions and policies and accept responsibility for both decisions and results.

Transparency is a prerequisite for accountability, especially to borrowers and lenders, issuers and investors, and national authorities and international financial institutions. This section discusses the benefits of transparency, emphasizes what transparency is not, and elucidates the constraints on transparent behavior.

Over the past decade, the concepts of transparency and accountability have been increasingly and strongly debated as part of economic policy discussions. Policy makers in some countries have long been accustomed to secrecy, which has been viewed as a necessary ingredient for the exercise of power in sensitive situations—with the added benefit of hiding incompetence! However, secrecy also hinders the assessment of the desired effects of policies. The changed world economy and financial flows, which have entailed increasing internationalization and interdependence, have placed the issue of openness at the forefront of economic policy making. There is growing recognition on the part of national governments, including central banks, that transparency improves the predictability and therefore the efficiency of policy decisions. Transparency forces institutions to face up to the reality of a situation and makes officials more responsible, especially if they know they will be called upon to justify their views, decisions, and actions. For these reasons, timely policy adjustment is encouraged.

In part, the case for greater transparency and accountability rests on the need for private sector agents to understand and accept policy decisions that affect their behavior. Greater transparency improves economic decisions taken by other agents in the economy. Transparency is also a way to foster

accountability, internal discipline, and better governance, while both transparency and accountability improve the quality of decision making in policy-oriented institutions. Such institutions—as well as other institutions that rely on them to make decisions—should be required to maintain transparency. If actions and decisions are visible and understandable, monitoring costs can be lowered. In addition, the general public is more able to monitor public sector institutions, shareholders and employees have a better view of corporate management, creditors monitor borrowers more adequately, and depositors can keep a better eye on banks. Poor decisions therefore do not go unnoticed or unquestioned.

Transparency and accountability are mutually reinforcing. Transparency enhances accountability by facilitating monitoring, while accountability enhances transparency by providing an incentive to agents to ensure that their actions are properly disseminated and understood. Greater transparency reduces the tendency of markets to place undue emphasis on positive or negative news and thus reduces volatility in financial markets. Taken together, transparency and accountability can also impose discipline that improves the quality of decision making in the public sector. This can result in more efficient policies by improving the private sector's understanding of how policy makers may react to events in the future.

What Transparency Cannot Ensure

Transparency and accountability are not, however, the solution for all possible problems. They are instead designed to assist in increasing economic performance and may improve the working of international financial markets by enhancing the quality of decision making and risk management among market participants.

In particular, transparency does not change the nature of banking or the risks inherent in financial systems. Transparency cannot prevent financial crises, but it may moderate the responses of market participants to bad news. Transparency also helps market participants anticipate and assess negative information, and it thereby mitigates panic and contagion.

An increasingly important element that needs to be considered in the transparency context is cybersecurity. Transparency might create an environment that facilitates cyber risk, which has become a growing and significant threat to the integrity, efficiency, and soundness of international financial markets. The increasing trend of banks facilitating digital interactions with all their customers makes the problem even more serious. The reporting framework should require cyber

incidents to be reported as soon as the banks detect them in order to identify and monitor trends in cyber incidents affecting significant institutions. Such a rapid reporting mechanism is expected to trigger fast reactions by the authorities to prevent negative implications for larger banks.

At the Group of Seven (G-7) Meeting of Finance Ministers and Central Bank Governors in 2017, the discussions on cybersecurity mandated development of common transparency and data-sharing requirements, complemented by practices that are tailored to bolster cyber resilience, including regular cyber exercises and simulations as well as consideration of how to most effectively leverage penetration tests.

Another aspect of transparency's increasing importance is the sharing of information to facilitate anti-money laundering (AML) and combating the financing of terrorism (CFT) measures in the process of supervising financial institutions (as discussed in chapter 14).

Constraints on Transparency

The dichotomy between transparency and confidentiality complicates development of an effective disclosure framework. The release of proprietary information may enable competitors to take advantage of particular situations—a prospect that often deters market participants from full disclosure. Similarly, monitoring bodies frequently obtain confidential information from financial institutions, which can have significant market implications. Under such circumstances, financial institutions may be reluctant to provide sensitive information without the guarantee of client confidentiality.

However, both unilateral transparency and full disclosure contribute to a regime of accountability and transparency. If such a regime were to become the norm, it would ultimately benefit all market participants, even if in the short term it might create discomfort for individual entities.

16.3 Transparency in Financial Statements

The objective of financial statements is to provide information about an entity's financial position (balance sheet), performance (income statement), and changes in financial position (cash flow statement). The transparency of financial statements is secured through full disclosure and by providing fair presentation of the information necessary for making economic and business decisions for a wide range of users. In the context of public disclosure, financial statements should be easy to interpret.

Adoption and Evaluation of IFRS Standards

The adoption of International Financial Reporting Standards (IFRS) has been a necessary measure to facilitate transparency and proper interpretation of financial statements. In 1989, the "Framework for the Preparation and Presentation of Financial Statements" was included in the IFRS to accomplish the following:

- Explain concepts underlying the preparation and presentation of financial statements to external users
- Guide those responsible for developing accounting standards
- Assist preparers, auditors, and users in interpreting the IFRS and in dealing with issues not yet covered by the standards.

As can be expected, specific disclosure requirements vary among regulators and countries. Nonetheless, certain key principles for evaluation of IFRS standards were proposed by the Basel Committee on Banking Supervision (BCBS) and agreed to by the G-7 Finance Ministers and Central Bank Governors in 2000. These key principles, still valid almost 20 years later, are summarized in box 16.1.

The IFRS Conceptual Framework for Financial Reporting

Financial statements are normally prepared under the assumption that an entity will continue to operate as a going concern and that events will be recorded on an accrual basis. In other words, the effects of transactions and other events should be recognized when they occur and be reported in the financial statements for the periods to which they relate.

The *Conceptual Framework for Financial Reporting*, revised by the International Accounting Standards Board (IASB) in March 2018, sets out the following (IFRS 2018):

- The objective of general purpose financial reporting
- The qualitative characteristics of useful financial information
- A description of the reporting entity and its boundary
- Definitions of an asset, a liability, equity, income, and expenses, as well as guidance supporting these definitions
- Criteria for including assets and liabilities in financial statements (recognition) and guidance on when to remove them (derecognition)
- Measurement bases and guidance on when to use them
- Concepts and guidance on presentation and disclosure
- Concepts relating to capital and capital maintenance.

BOX 16.1 Criteria for Evaluating International Financial Reporting Standards

- Accounting standards should contribute to—or at least be consistent with (not hamper)—sound risk management and control practices in banks. As well, they should provide a prudent and reliable framework for the generation of high-quality accounting information in banks.
- Accounting standards should facilitate market discipline by promoting transparent financial reporting of banks' financial position and performance, risk exposures, and risk management activities.
- Accounting standards should facilitate and not constrain the effective supervision of banks.
- Accounting principles should generate relevant and meaningful accounting information.
- Accounting principles should generate prudent and realistic measurements of financial position and performance.
- Accounting principles should generate reliable[a] measurements of financial position and performance.
- Accounting standards should not only have a sound theoretical foundation, but also be workable in practice.
- Accounting standards should not be overly complex in relation to the issue addressed.
- Accounting principles should generate consistent measurements of similar or related items.
- Accounting standards should be sufficiently precise to ensure consistent application.
- Preferably, accounting standards should not allow alternative treatments. When alternative accounting treatments are permitted, or judgments are necessary in applying accounting principles, balanced disclosures should be required.
- Disclosures should be sufficiently comprehensive for an assessment of a bank's financial position and performance, risk exposures, and risk management activities.
- International Accounting Standards (IFRS) should be suitable for implementation not only in the most advanced financial markets but also in emerging markets.

Source: BCBS 2000.

a. As part of the "reliability" criterion, the Committee believes that fair value information must be auditable.

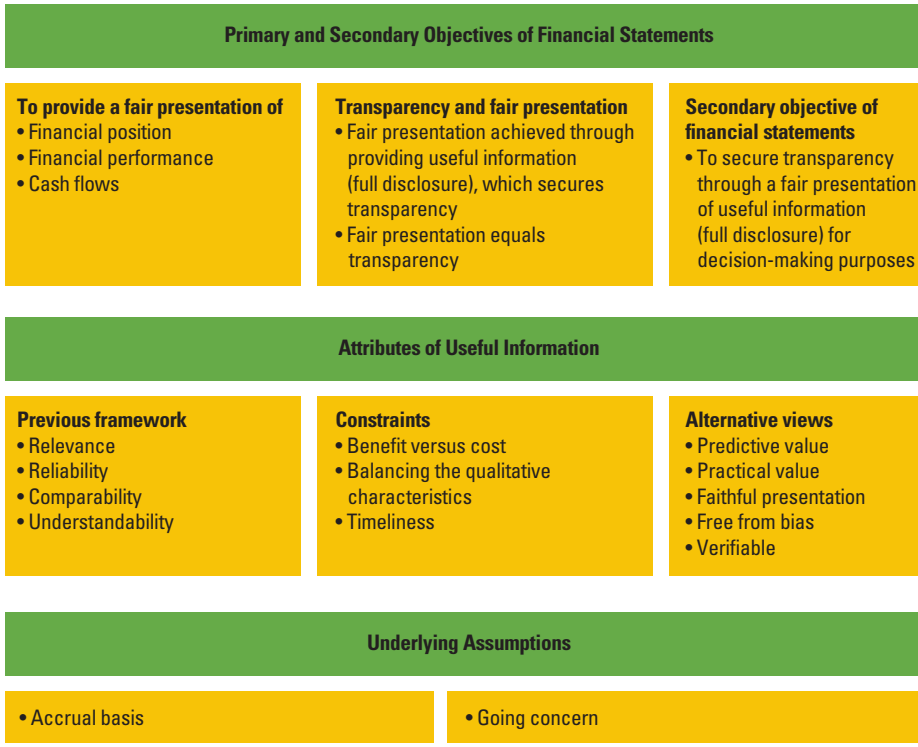
"Qualitative characteristics" are those attributes that make the information provided in financial statements useful. Without comprehensive, useful information, managers may not be aware of the true financial condition of their bank, and key governance players may be misled. This would in turn prevent the proper enforcement of market discipline. In contrast, the application of key qualitative characteristics and appropriate accounting standards normally results in financial statements that present a true and fair picture. Following are the requisite qualitative characteristics of financial information:

- *Relevance.* Information must be relevant because it influences users' economic decisions by helping them to evaluate the past and present, to make realistic assumptions about future events, or to confirm or correct past assessments. The relevance of information is determined by its nature and material quality. Information overload should be avoided because it can force players to sift through a plethora of information for relevant details, making interpretation difficult.
- *Reliability.* Information should be free from material errors and bias. The key aspects of reliability are faithful representation, priority of substance over form, neutrality, prudence, and completeness.
- *Comparability.* Information should be presented consistently over time and be congruous with related information and with other entities to enable users to make comparisons.
- *Understandability.* Information should be easily comprehended by users with reasonable knowledge of business, economics, and accounting as well as the willingness to diligently study the information.

The process of producing useful information comprises the following critical points to ensure the comprehensiveness of the information provided:

- *Timeliness.* A delay in reporting may improve reliability but could simultaneously decrease relevance.
- *Benefit versus cost.* Benefits derived from information should normally exceed the cost of providing it. Banks in low- and middle-income countries often lack adequate accounting systems and therefore have a lower capacity for providing relevant information. The target audience's level of sophistication is also important. Both of these aspects affect the costs and benefits of improved disclosure. However, the mere fact that a bank might lack accounting systems capable of producing useful information should not be accepted as an excuse for not obtaining and providing it for the markets.

Figure 16.1 Use of IFRS Framework for Transparency in Financial Statements



- *Balancing qualitative characteristics.* Providers of information must achieve an appropriate balance of qualitative characteristics to ensure that financial statements are adequate for their particular environment.

In the context of fair presentation, it is better to *not* disclose information than to disclose *misleading* information. It is therefore not surprising that when an entity does not comply with specific disclosure requirements, the IFRS requires full disclosure of the fact and the reasons for noncompliance. Figure 16.1 summarizes how transparency is secured through the proper application of the concepts making up the IFRS framework.

16.4 Disclosure in the Financial Statements of Banks

Disclosure requirements related to financial statements have traditionally been a pillar of sound regulation. Disclosure is an effective mechanism to expose banks

to market discipline. Although a bank is normally subject to supervision and provides regulatory authorities with information, this information is often confidential or market sensitive and is not always available to all categories of users. Disclosure in financial statements should therefore be sufficiently comprehensive to meet the needs of most users within the constraints of what can reasonably be required. Improved transparency through better disclosure may (but not necessarily) reduce the chances of a systemic banking crisis or the effects of contagion, because creditors and other market participants will be better able to distinguish between the financial circumstances that face different institutions and countries.

Users of financial statements need information to assist them in evaluating a bank's financial position and performance and in making economic decisions. Of key importance are a realistic valuation of assets (including sensitivities to future events and adverse developments) and the proper recognition of income and expenses. Equally important is the evaluation of a bank's entire risk profile, including on- and off-balance-sheet items, capital adequacy, the capacity to withstand short-term problems, and the ability to generate additional capital. Users may also need information to better understand the special characteristics of a bank's operations—in particular, solvency, liquidity, and the relative degree of risk involved in various dimensions of the banking business.

The issuance of IFRS has followed developments in international financial markets. Over time, the IFRS has broadened its coverage, both to include new topics (for example, disclosure and presentation related to new financial instruments) and to enhance the existing international standards. IFRS 7—"Financial Instruments: Disclosures," published in 2005 and since amended multiple times—resulted in many financial regulators requiring a "full disclosure" approach.

16.5 IFRS 9

Principles for recognizing, measuring, and disclosing information about financial instruments in the financial statements were originally established in 2003 by International Accounting Standard 39 (IAS 39 Financial Instruments: Recognition and Measurement). In 2018, IFRS 9 ("Financial Instruments") replaced IAS 39. However, the new standard significantly retains the use of fair value accounting for financial instruments, particularly on the assets side of the balance sheet.

IFRS 9 distinguishes between three measurement classes of financial assets: amortized cost, fair value through other comprehensive income, and

fair value through profit and loss. Financial liabilities are measured either at amortized cost or fair value through profit and loss (table 16.1).

IFRS 9 requires significant changes to provisioning methodologies for banks. IAS 39 provisioning was based on an incurred-loss approach, whereas IFRS 9 is a forward-looking model, requiring banks to estimate *expected losses* in their credit portfolios. Impairment of financial assets are recognized in stages:

- *Stage 1:* As soon as a financial instrument is originated or purchased, 12-month expected credit losses are recognized in profit or loss and a loss allowance is established. This serves as a proxy for the initial expectations of credit losses. For financial assets, interest revenue is calculated on the gross carrying amount (that is, without deduction for expected credit losses).
- *Stage 2:* If the credit risk increases significantly and is not considered low, full lifetime expected credit losses are recognized in profit or loss. The calculation of interest revenue is the same as for Stage 1. A significant change can be described as a change that would have altered the original credit decision—either at a different price or a decline of the transaction.
- *Stage 3:* If the credit risk of a financial asset increases to the point that it is considered credit impaired, interest revenue is calculated based on the amortized cost (that is, the gross carrying amount less the loss allowance). Financial assets in this stage will generally be assessed individually. Lifetime expected credit losses are recognized on these financial assets.

Table 16.1 Measurement of Financial Assets and Liabilities under IFRS 9

Category	Measurement class	Financial assets	Financial liabilities
1	Amortized cost	• Assets held within a business model whose objective is to collect contractual cash flows • The contractual terms of the financial asset give rise on specified dates to cash flows that are solely payments of principal and interest (on the principal amount outstanding)	• All financial liabilities, except those designated at fair value through profit and loss • Items designated as hedging instruments
2	Fair value through other comprehensive income	Assets held in a business model whose objective is achieved by both collecting contractual cash flows and selling financial assets	
3	Fair value through profit and loss	Assets not held in one of the two business models above	

International financial reporting standards provide a solid and transparent basis for the development of national disclosure requirements. These standards already require banks to disclose extensive information on all risk categories, adding transparency to the presentation of financial statements.

Accounting standards should contribute to sound risk management practices and consider the ways in which trading and banking books are actually managed. However, financial statements should also reflect the reality of transactions in a conceptually consistent manner, and this objective will always produce a certain amount of tension between accountants and practitioners.

References

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17

A Risk-Based Approach to Bank Supervision

KEY MESSAGES

- The analyst or supervisor should determine what happened, why it happened, the impact of events, and a credible future strategy to rectify unacceptable trends.
- The supervisory process of off- and on-site supervision is similar to the financial analysis of information, which must be tested through verification of preliminary conclusions. On-site examination is essential but could be performed by supervisors, analysts, or external auditors.
- Regulators and supervisors should ensure that all financial institutions are supervised using a consistent philosophy to ensure a level playing field for financial intermediaries.
- Supervisory review, recognized as Pillar 2, has become a key ingredient of the capital adequacy framework under the Basel II Accord.
- Supervisory reviews should also include the assessment of cybersecurity and money laundering aspects, which have become an increasing challenge for international banking markets.
- Assessments of supervisory authorities, if properly used, can enhance the institutional development of the banks concerned.

17.1 Introduction: The Bank Supervisory Process

Banking supervision, based on the ongoing analytical review of banks, serves the public good as one of the important factors in maintaining stability and confidence in the financial system. It represents Pillar 2 of the Basel II Accord and has become the key ingredient of the capital adequacy framework. This chapter discusses the key principles of supervisory reviews and the relationship between banking risk analysis and the supervision process. From the

methodological perspective, an analytical review of banks by supervisors is similar to that used by private sector analysts, external auditors, or a bank's own risk managers, except for the focus and ultimate purpose of the analysis.

Bank supervision, which normally includes off-site surveillance and on-site examinations, is an integral part of a much broader and continuous process (figure 17.1). This process includes the establishment of a legal framework for the banking sector, the designation of regulatory and supervisory authorities, the definition of licensing conditions and criteria, and the enactment of regulations that limit the level of risk that banks are allowed to take. Other necessary steps include the establishment of a framework for prudential reporting and off-site surveillance and the execution of these activities, followed by on-site supervision.

Figure 17.1 The Context of Bank Supervision

The results of on-site examinations provide inputs for the institutional development process of relevant banks and for the improvement of the regulatory and supervisory environment.

As specified in *Core Principles for Effective Banking Supervision* (BCBS 2012), when performing such an evaluation, four major categories of compliance assessment are used (see annex 17B):

- *Compliant:* A country will be considered compliant with a Principle when all essential criteria applicable for this country are met without any significant deficiencies. There may be instances where a country can demonstrate that the Principle has been achieved by other means. Conversely, due to the specific conditions in individual countries, the essential criteria may not always be sufficient to achieve the objective of the Principle, and therefore other measures may also be needed in order for the aspect of banking supervision addressed by the Principle to be considered effective.
- *Largely compliant:* A country will be considered largely compliant with a Principle whenever only minor shortcomings are observed that do not raise any concerns about the authority's ability and clear intent to achieve full compliance with the Principle within a prescribed period of time. The assessment "largely compliant" can be used when the system does not meet all essential criteria, but the overall effectiveness is sufficiently good, and no material risks are left unaddressed.
- *Materially noncompliant:* A country will be considered materially noncompliant with a Principle whenever there are severe shortcomings, despite the existence of formal rules, regulations, and procedures, and there is evidence that supervision has clearly not been effective, that practical implementation is weak, or that the shortcomings are sufficient to raise doubts about the authority's ability to achieve compliance. It is acknowledged that the "gap" between "largely compliant" and "materially noncompliant" is wide, and that the choice may be difficult. On the other hand, the intention has been to force the assessors to make a clear statement.
- *Noncompliant:* A country will be considered noncompliant with a Principle whenever there has been no substantive implementation of the Principle, several essential criteria are not complied with, or supervision is manifestly ineffective.

A "not applicable" grading can also be used under certain circumstances.

In addition to effective prudential regulation and supervision, other factors necessary for the stability of banking and financial systems and markets include sound and sustainable macroeconomic policies, a well-developed financial sector infrastructure, effective market discipline, and an adequate banking sector safety net (see chapter 1).

A risk-based supervisory analysis of banks follows a number of stages—the results of one stage serving as inputs to the next (table 17.1). The ultimate objective of this process is a set of recommendations that, if properly implemented, result in a safe, sound, and properly functioning financial intermediary.

Pillar 1 of the Basel Accord sets a buffer for uncertainties that affect the banking population as a whole. The buffer aims to provide reasonable assurance that a bank with good internal systems and well-managed controls, a "standard" business profile, and a well-diversified risk profile will meet the minimum goals for soundness, as embodied in Pillar 1 (minimum capital requirements).

Table 17.1 Stages of the Analytical Review Process

Analytical phase	Sources or tools	Output
Structuring and collection of input data	Questionnaires, financial statements, and other financial data	Completed input data, questionnaires, and financial data tables
Processing of data	Completed input data (questionnaires and financial data tables)	Processed output data
Analysis and interpretation of processed or structured output data	Data converted into information	Analytical results
Development of an off-site analysis report of the bank's risks	Analytical results and previous on-site examination reports	Off-site examination report and/or terms of reference for on-site examination
Follow-up through on-site examination, audit, or analytical review	Off-site examination report and terms of reference for on-site examination	On-site examination report and institutional development plan or a memorandum of understanding
Institutional strengthening	On-site examination report and memorandum of understanding for institutional development	Well-functioning financial intermediary
Repeat the process, building on the previous reports and regulatory deficiencies identified	Repeat the process . . .	Repeat the process . . .

Bank-specific uncertainties are expected to be assessed and addressed under Pillar 2 (supervisory review).

Supervisors should therefore regularly review and evaluate banks' internal processes and systems (especially those related to risk management and capital adequacy assessment) as well as their ability to monitor and ensure their compliance with regulatory capital ratios and other prudential norms (Pillar 2, Principle 2).[1] In this context, supervisory processes should ensure that various instruments that can reduce Pillar 1 capital requirements are well understood and are used as part of a sound, tested, and properly documented risk management process. If not, supervisors should require (or encourage) banks to operate with a capital buffer that is over and above the Pillar 1 standard (Pillar 2, Principle 3).[2]

An analytical review normally comprises a review of the bank's financial conditions, its internal processes and systems, and specific issues related to risk exposure and risk management. In addition to verifying the conclusions reached during off-site reviews, on-site reviews cover a much larger number of topics and are more concerned with qualitative aspects, including the availability and quality of management information. The questions asked during all phases of the analytic review process should focus on the following:

- What happened
- Why it happened
- The impact of the event or trend
- The actions or response of the bank's management
- The systems and tools that the bank had at its disposal to deal with the issue and whether it effectively used them.

The details that an analyst should look for during an analytical review related to risk management have been discussed in chapters 4–13. Analytical tools provided in this publication, as discussed in chapter 3, include tables and graphs based on processed input data that relate to balance sheet structure, profitability, capital adequacy, credit and market risk, liquidity, and currency risk. Taken together, they make up a complete set of a bank's financial ratios that are normally subject to off-site surveillance.

Graphs provide a visual representation of results—a snapshot of a bank's current situation. The graphs illustrated in the publication may also be used during the process of off-site surveillance as a starting point for on-site examination.

17.2 Banking Risks and the Accountability of Regulatory and Supervisory Authorities

During the course of their operations, banks are subject to a wide array of risks (as shown in chapter 1, table 1.1). In general, banking risks fall into the following four categories:

- *Financial risks,* as discussed in chapters 7–12, which comprise *traditional* banking risks (such as balance sheet and income statement structure, credit, and solvency risks) and *treasury* risks from financial arbitrage (such as liquidity, interest rate, currency, and market [including counterparty] risks)
- *Operational and business risks,* as covered in chapters 13–15, related to a bank's overall business strategy and the functioning of its internal systems (including computer systems and information technology [IT] compliance with policies and procedures, and the possibility of mismanagement and fraud); business risks associated with a bank's business environment; information governance; management of staff and other resources; product development and customer acquisition approaches (business and market conduct); and reputational, legal, and regulatory factors
- *Environmental risks,* including all types of exogenous risks that, if they were to materialize, could jeopardize a bank's operations or undermine its financial condition and capital adequacy—such as political events (for example, the fall of a government); contagion resulting from the failure of a major bank or a market crash; banking crises; natural disasters; and civil wars, as well as environmental impacts on strategic planning (or more frequently, a lack thereof)
- *Event risks* that are usually unexpected until immediately before the event and therefore impossible to adequately prepare for other than by maintaining a capital cushion. The dividing line between the end of an event risk and the beginning of systemic risk is often blurred.

Risk that is inherent in banking should be recognized, monitored, and controlled. Some financial risks are regulated when regulators establish prudential guidelines for a particular type of banking risk exposure. The effectiveness of a bank's management of financial risk, monitoring of risk exposure, and compliance with prudential regulations and guidelines forms the backbone of the bank supervision process, both off- and on-site.

Compliance with regulations, however, can be costly for a bank. The manner in which regulators perform their functions determines the specific impact

of regulations on the market as well as the cost of compliance for the bank. Costs include provision of information to regulators; maintenance of internal systems that measure risk and ensure compliance with regulations; and restrictions that may influence certain business decisions, effectively reducing the bank's profitability. In addition to the direct cost of regulation, hidden costs include the reduced ability to innovate or quickly adjust to changing market conditions, which might in turn prevent the bank from capitalizing on its comparative advantages or competitive position.

As for operational risks (except for business strategy risk), regulators typically establish guidelines that banks are expected to follow. Adherence to the guidelines is subject to supervision, typically as part of an on-site examination. A bank's business strategy is also given attention. As part of the initial licensing process, the authorities review and implicitly endorse a bank's business strategy. The strategy and its risk implications are always discussed during the process of an on-site examination and possibly also in the context of off-site surveillance. In many countries, senior management is obliged to conduct quarterly discussions on a bank's business strategy with supervisory authorities, especially in the case of large banks upon which market stability may depend.

The category of risks related to a business environment may or may not fall within the scope of supervisory authorities. However, banking system regulatory authorities (including the central bank) are usually closely related to many key aspects of a bank's business environment. Entry and licensing regulations effectively determine a banking system's structure and the level and nature of competition. The criteria for issuing licenses must therefore be consistent with those applied in ongoing supervision. If the supervisory authority is different from the licensing authority, the former should have a legal right to have its views considered by the latter.

Monetary authorities also play a critical role in determining a business environment. The choice, design, and use of monetary policy measures and instruments are inextricably related to banking system conditions, the nature of bank competition, and the capacity of the banking system to innovate. In the choice and use of policy instruments, pragmatic considerations (which imply a connection to supervisory authorities) are of prime importance. It is essential to look not only at specific policies or measures but also at the context in which they are applied. Similar policies may be transmitted but work in different ways, depending on the structure, financial conditions, and dynamics of the banking system and markets.

Supervisory authorities are not involved with other aspects of business environments that have risk implications, such as macroeconomic policies, which often determine supply and demand conditions in markets and are a major component of country risk. In addition, authorities are not usually directly concerned with the tax environment (which directly affects a bank's bottom line), the legal framework, or the financial sector infrastructure (including the payment system and registries), but they may be influential in proposing changes and improvements in these areas.

Concerning event risks, supervisory authorities play a critical role. Although these risks may not be foreseen and often cannot be prevented, the authorities evaluate the impact of such events on the status and condition of the banking system and the markets. They also ensure that proper arrangements are put in place to minimize the impact and extent of disruption, to mobilize other authorities to effectively deal with the consequences of certain events, and ultimately to oversee the orderly exit of failed institutions.

17.3 The Supervisory Process

All banking systems have at least one regulatory and supervisory authority. However, the locus, structure, regulatory and enforcement powers, and specific responsibilities of each authority are different. This variation is usually a consequence of a particular country's traditions and legal and economic environment. Decisions on regulatory and supervisory authorities are sometimes politically motivated. In most countries, the regulatory and supervisory authority for the banking sector is assigned to the central bank, but the current trend is for the consolidation of all financial supervision in a separate entity outside the central bank.

Scope and Responsibilities of Banking Supervision

The responsibilities and objectives of each of the authorities involved in banking supervision must be clearly defined in legislation and publicly disclosed. Where more than one authority is responsible for supervising the banking system, a credible and publicly available framework should be in place to avoid regulatory and supervisory gaps. The responsibilities of bank supervision usually include the following:

- Issuance and withdrawal of banking licenses on an exclusive basis
- Issuance and enforcement of prudential regulations and standards

- Authority to prescribe and obtain periodic reports (that is, establish prudential reporting as a precondition for off-site surveillance) and to perform on-site inspections
- Assessment of fines and penalties and the initiation of emergency actions, including cease and desist orders, management removal and suspension orders, and the imposition of conservatorship
- Closure or liquidation of banks.

The critical elements of effective banking supervision are as follows:

- Laws and regulations should provide an effective framework for the supervisor to set and enforce minimum prudential standards for banks and banking groups. The supervisor must have the power to increase the prudential requirements for individual banks and banking groups based on their risk profile and systemic importance.
- Banking laws, regulations, and prudential standards should be updated as necessary to ensure that they remain effective and relevant to changing industry and regulatory practices. These should be subject to public consultation, as appropriate.
- The supervisor should:
  - Have full access to banks' and banking groups' boards, management, staff, and records to review compliance with internal rules and limits as well as external laws and regulations
  - Review the overall activities of a banking group, both domestic and cross-border
  - Supervise the activities of foreign banks incorporated in its jurisdiction.
- When, in a supervisor's judgment, a bank is not complying with laws or regulations, or when it is or is likely to be engaging in unsafe or unsound practices or actions that have the potential to jeopardize the bank or the banking system, the supervisor should have the power to do the following:
  - Take (or require a bank to take) timely corrective action
  - Impose a range of sanctions
  - Revoke the bank's license
  - Cooperate and collaborate with relevant authorities on an orderly resolution of the bank, including triggering resolution where appropriate.
- The supervisor should have the power to review the activities of parent companies and of companies affiliated with parent companies to

determine their impact on the safety and soundness of the bank and the banking group.

Supervisory review should specifically assess material risks faced by the bank, as follows:

- *Credit risk review* involves internal risk rating systems, portfolio analysis and aggregation, securitization and use of complex credit derivatives, exposure to risk, and risk concentration.
- *Operational risk review* involves assessing the bank's tolerance for operational risk and its approach to identifying, assessing, monitoring, controlling, and mitigating the risk. One of the critical elements of operational risk are risks related to IT systems and interconnectivity. Interconnectivity is one of the key elements for efficient functioning of the global financial markets and payment systems, as well as banking services, that can be seriously challenged by cyber risks. As an element of competitiveness, most banks offer digital interactions with customers. Recent assessments indicate that, in more developed countries, more than half of all bank customers rely on digital-only access, and this number is increasing. Consequently, cybersecurity risks are becoming an increasing concern as cyberattacks become more frequent, more complex, and more difficult to control.
- *Market risk review* involves the methodologies used to assess and manage this risk by individual staff members, business units, and bankwide. For more sophisticated banks, the assessment of internal capital adequacy for market risk should be based, at a minimum, on value-at-risk modeling and stress testing, including risk concentration and illiquidity under stressful market scenarios. For all banks, supervisory review should include stress testing appropriate for the individual bank's trading activity.
- *Interest rate risk assessment (asset–liability risk management)* should review assumptions, techniques, and management practices for all material interest rate positions, including relevant repricing and maturity data.

In addition, the supervisory review should examine details of the bank's management information reporting and systems, the manner in which business risks and activities are aggregated, and management's record in responding to emerging or changing risks. Close attention should be given to the bank's internal control structures—their coverage and their effectiveness.

Authorities are also expected to ensure that financial institutions are subject to adequate regulation and supervision related to money laundering and terrorist financing, which are becoming an increasing problem worldwide. The Financial Action Task Force (FATF) maintains an ongoing effort to develop practical recommendations related to money laundering and terrorist financing (as detailed in chapter 14). Regulatory and supervisory authorities are expected to take the necessary legal or regulatory measures to prevent criminals or their associates from holding, or being the beneficial owner of, a significant or controlling interest or from holding a management function in a financial institution. The supervision process is expected to ensure that any anti-money laundering regulations are complied with. Supervisors are expected to have powers to impose a range of disciplinary and financial sanctions, including the power to restrict or suspend financial institutions' license.

Basel II and III Provisions

The supervisory review process under Pillar 2 of the Basel II and Basel III Accords aims to evaluate banks' assessments and risk systems after banks have themselves assessed their internal capital adequacy.

The supervisory review must verify compliance, on a continuing basis, with the minimum standards and disclosure requirements related to the use of advanced methods in Pillar 1 (minimum capital requirements). The review must assess risks that are not fully captured by the Pillar 1 process (for example, credit concentration risk) and factors not considered by the Pillar 1 process (for example, interest rate, business, and strategic risk). The impact of factors external to the bank (for example, business cycle effects) must be considered.

The Basel Committee on Banking Supervision (BCBS) has identified certain preconditions and set certain standards in *Core Principles for Effective Banking Supervision* (BCBS 2012). Annex 17A provides details on the 29 Core Principles as well as a summary of the appraisal process. The first version contained 25 principles, and 4 were added after the 2008–09 banking crises.

These standards require that a supervisory authority have a clear, achievable, and consistent framework of responsibilities and objectives as well as the ability to achieve them. If more than one supervisory authority exists, all must operate within a consistent and coordinated framework to avoid regulatory and supervisory arbitrage. Where distinctions between banking business and other

deposit-taking entities are not clear, the latter could be allowed to operate as quasi banks, with less regulation.

Resources and Tools of Action for Supervisory Authorities

Supervisory authorities should have adequate resources, including the staffing, funding, and technology needed to meet established objectives, provided on terms that do not undermine the autonomy, integrity, and independence of the supervisory agencies. Supervisors must be protected from personal and institutional liability for actions taken in good faith while performing their duties. Supervisory agencies should be obliged to cooperate and share relevant information, both domestically and abroad. This cooperation should be supported by arrangements for protecting the confidentiality of information.

Supervisory authorities, however, cannot and are not supposed to guarantee that banks will not fail. The potential for bank failure is an integral part of risk taking. Supervisors have a role to play, but there is a difference between their role in the day-to-day supervision of solvent institutions and their handling of problem institutions to prevent contagion and systemic crisis. Supervisors should seek to intervene at an early stage to prevent capital from falling below the minimum levels required to support the risk characteristics of a particular bank and should require rapid remedial action if capital is not maintained or restored. These actions may include intensifying the monitoring of the bank, restricting the payment of dividends, requiring the bank to prepare and implement a satisfactory capital adequacy restoration plan, and requiring the bank to raise additional capital immediately. Supervisors should have the discretion to use the tools best suited to the circumstances of the bank and its operating environment (table 17.2).

When approaching systemic issues, the key concern of supervisory authorities is to address threats to confidence in the financial system and of contagion to otherwise sound banks. The supervisor's responsibility is to make adequate arrangements that could facilitate the exit of problem banks with minimum disruption to the system. At the same time, the methods applied should minimize distortions to market signals and discipline. Individual bank failure, on the other hand, is an issue for shareholders and management. In some cases, a bank failure may become a political issue—especially in the case of large banks—and involve decisions on whether, to what extent, and in what form public funds should be committed to turning the situation around.

Table 17.2 Toolbox for Action by Bank Supervisory Authorities

Tools	Area of application	Advantages	Disadvantages
Rules	Pillar 1: Capital requirements	• Certainty • Simplicity • Direct	• Static • Inflexible • Limited
Incentives	Pillar 1: Approaches	• Behavioral impact	• Sensitivity
Discretion	Pillar 2: Supervisory review	• Adaptable	• Uncertainty • Not comparable
Market discipline (disclosure)	Pillar 3: Disclosure of risk	• Market based	• Overshoots

Note: Pillars 1, 2, and 3 refer to provisions of the Basel Accords.

Off-Site Surveillance versus On-Site Examination

An effective banking supervision system comprises some form of both off-site surveillance and on-site examination. Table 17.3 summarizes the different focuses of these two processes. *Off-site surveillance* is an early warning device that is based on the analysis of financial data supplied by banks. *On-site examination* builds upon and supplements off-site surveillance and enables supervisory authorities to examine details and to judge a bank's future viability.

The extent of on-site work and the method by which it is carried out depend on a variety of factors. In addition to differences in supervisory approaches and techniques, the key determinant of the objectives and scope of supervision is whether they aim only to safeguard banking system stability or whether they are also expected to protect the interest of depositors. In some countries, a mixed system of on-site examination exists that is based on collaboration between supervisors and external auditors.

Off-Site Surveillance

The central objective of off-site surveillance is to monitor the condition of individual banks, peer groups, and the banking system. The principles described in this publication provide the tools for a comprehensive off-site analysis of banks. Based on this assessment, a bank's performance is then compared with its peer group and the banking sector overall to detect significant deviations from the peer group or sectoral norms and benchmarks.

Table 17.3 Off-Site Surveillance versus On-Site Examination in Banking Supervision

Off-site surveillance	On-site examination
Objectives	
Monitor the financial condition of both individual banks and the banking system	Monitor the financial condition, performance, and future viability of individual banks
Provide peer statistics and the means for comparison with a peer group	Assess reasons for deviations from peer group
Provide early identification of problems and noncompliance	Provide a detailed diagnosis of problems and noncompliance
Give priorities for the use of supervisory resources	Provide recommendations to management
Guide scheduling of on-site examinations	Initiate punitive actions as needed
Methodology	
Analytical, risk based	Analytical, risk based
Descriptive	Evaluative, tests descriptions
Uses questionnaires and prescribed reporting formats	Uses interrogation of and discussions with bank management and responsible staff
Based on financial data reporting	Based on on-site visits and examination of actual records
Uses	
Most effective in assessing trends in earnings and capital and comparing performance against peers	Most effective in determining the quality of management; the appropriateness of asset-liability and financial risk management; and the effectiveness of policies, procedures, systems, and controls
Provides input for sensitivity analysis, modeling, and forecasting	Provides input for institutional strengthening or development programs
Depends on the timeliness, accuracy, and completeness of financial information reported by banks	Allows verification to determine accuracy of financial information and adherence to sound accounting standards and principles
Provides comparative data in a standard format for supervisory authorities, financial analysts, and bank management	Uses comparative data and off-site prudential reports
Could be used to monitor selected types of financial institutions and the banking sector	Provides input for early warning systems and identifies potential systemic issues that must be addressed to avoid potential crisis situations
Provides input to economic and monetary policy makers	Identifies systemic issues and provides corresponding inputs to economic and policy decision makers for measures to avoid potential crises

This process provides an early indication of an individual bank's problems as well as systemic problems; it also helps prioritize the use of scarce supervisory resources in areas or activities under the greatest risk. Off-site monitoring systems rely on financial reporting in a prescribed format that banks supply according to previously determined reporting schedules.

Reporting formats and details vary among countries, although most supervisory authorities systematically collect and analyze data concerning liquidity; capital adequacy; credit risk; asset quality; concentration of exposures and large exposures; interest rate, currency, and market risks; earnings and profitability; and balance sheet structure. Supporting schedules may also be requested to provide greater detail of a bank's exposure to different types of risk and its capacity to bear those risks. Schedules are determined by the type and subject of related reports. For example, supervisory authorities may require liquidity to be reported weekly or even daily, large exposures monthly, financial statements quarterly, and asset classification and provisions semiannually.

The sophistication and exact purpose of analytical reviews also vary from country to country. Most supervisory authorities use some form of ratio analysis. The current financial ratios of each bank are analyzed and compared with historical trends and with the performance of their peers to assess financial condition and compliance with prudential regulations. This process may also identify existing or forthcoming problems. Individual bank reports are aggregated to attain group (or peer) statistics for banks of a particular size, business profile, or geographical area. These aggregated reports can then be used as a diagnostic tool or in research and monetary policy analysis.

Off-site surveillance is less costly than on-site examination in terms of supervisory resources. Banks provide the information needed for supervisors to form a view of a bank's exposure to the various categories of financial risk. Supervisory authorities then manipulate and interpret the data. Although off-site surveillance allows supervisors to systematically monitor developments concerning a bank's financial condition and risk exposures, it has the following limitations:

- The usefulness of reports depends on the quality of a bank's internal information systems and on the accuracy of reporting.
- Reports have a standard format that may not adequately capture new types of risks or the particular activities of individual banks.
- Reports cannot sufficiently convey all factors affecting risk management, such as the quality of a bank's management personnel, policies, procedures, and internal systems.

On-Site Examinations

On-site examinations enable supervisors to validate the information provided by a bank during the prudential reporting process, to establish the diagnosis and the exact cause of a bank's problems with adequate detail, and to assess a bank's future viability or possible problem areas. More specifically, on-site examinations should help supervisors assess the accuracy of a bank's reports, its overall operations and condition, the quality and competence of management, and the adequacy of risk management systems and internal control procedures. Other aspects that should be evaluated include the quality of the loan portfolio, adequacy of loan loss provisions and reserves, accounting and management information systems, the issues identified in off-site or previous on-site supervisory processes, adherence to laws and regulations, and the terms stipulated in the banking license. On-site examination is demanding in terms of supervisory resources and usually can address only some of a bank's activities.

On-site examinations can take different forms depending on a bank's size and structure; available resources; and the sophistication, knowledge, and experience of supervisors. Supervisory authorities should establish clear internal guidelines on the objectives, frequency, and scope of on-site examinations. Policies and procedures should ensure that examinations are systematic and conducted in a thorough and consistent manner.

In less-developed supervisory systems, the examination process often provides only a snapshot of a bank's condition, without assessing potential risks or the availability and quality of systems used by management to identify and manage them. On-site supervision begins with business transactions and proceeds from the bottom up. Examination results from the successive stages of supervision are compiled and eventually consolidated to arrive at final conclusions regarding a bank's overall financial condition and performance. This approach is characteristic of countries in which management information is unreliable and bank policies and procedures are not well articulated.

In well-developed banking systems, supervisors typically use a top-down approach that focuses on assessing how banks identify, measure, manage, and control risk. Supervisors are expected to diagnose the causes of a bank's problems and to ensure that they are addressed by preventive actions that can reduce the likelihood of recurrence. The starting point of an on-site examination is an assessment of objectives and policies related to risk management; the directions provided by the board and senior managers; and the coverage, quality, and

effectiveness of systems used to monitor, quantify, and control risks. The completeness and effectiveness of a bank's written policies and procedures are then considered as well as planning and budgeting, internal controls and audit procedures, and management information systems. Examination at the business-transaction level is required only if weaknesses exist in systems for identifying, measuring, and controlling risks. In many countries, external auditors examine systems and processes at this level.

17.4 Technological Developments

Early Warning Systems

In the 1990s, supervisory authorities started to refine their early warning systems—aimed at supervisory risk assessments and identification of potential future problems in the financial system and individual banks. These systems generally combine qualitative and quantitative elements. Just as approaches to banking regulation and supervision differ from country to country, the designs of such early warning systems also vary, but four generic types can be distinguished.

Supervisory bank rating systems. The best known of these is CAMELS (*capital, asset quality, management, earnings, liquidity,* and *sensitivity to market risk*). A composite rate is assigned to a bank typically as a result of an on-site examination.

Financial ratio and peer group analysis systems (normatives). These are based on a set of financial variables (typically including capital adequacy, asset quality, profitability, and liquidity) that generate a warning if certain ratios exceed a predetermined critical level, fall within a predetermined interval, or are outliers regarding a bank's past performance.

Comprehensive bank risk assessment systems. A comprehensive assessment of a bank's risk profile is made by disaggregating a bank (or a banking group) into significant business units and assessing each separate business unit for all business risks. Scores are assigned for previously specified criteria, and assessment results are aggregated to arrive at the final score for the whole bank or banking group.

Statistical models. These attempt to detect those risks most likely to lead to adverse future conditions in a bank. In contrast with the other three systems, the ultimate focus of statistical models is the prediction of the probability of future developments rather than a summary rating of the bank's

current condition. Statistical models are based on various indicators of future performance, as follows:

- *Probability of a rating downgrade* is estimated for an individual bank (such as the probability that the most recent CAMELS rating will be downgraded based on financial data supplied in prudential reporting).
- *Failure-of-survival prediction* models are constructed on a sample of failed or distressed banks. These models aim to identify banks whose ratios or indicators (or changes thereof) are correlated to those of already failed or distressed banks.
- *Expected-loss models* are used in countries where the statistical basis of failed or distressed banks is not large enough to be able to link changes in specific financial variables to probabilities of failure. These models are based on failure probabilities derived from banks' exposure to credit risk and other data, such as the capacity of existing shareholders to supply additional capital.
- *Models based on other variables*, as constructed by some regulators. For example, high assets growth that has not been adequately matched with strengthened management and institutional capacity has often been the culprit for bank failure. Therefore, a model tracing a high rate of asset growth combined with measures of institutional capacity could be used as an early warning system.

In many cases, supervisory authorities use more than one early warning system. The major issues with early warning systems are the proper choice of variables upon which the prediction is based; the availability of reliable input data; and the limitations related to quantification of qualitative factors that are critically related to banks' performance (for example, management quality, institutional culture, and integrity of internal controls).

The use of early warning systems in a country provides an important tool in the implementation of the Basel Accords. Under the Accords, supervisory authorities are expected to evaluate the quality of external ratings and decide what would be a reasonable set of risk weights to use in their jurisdiction for capital adequacy calculation. Peer group analysis, risk assessment systems, and statistical models provide a solid basis for rational decisions on such key parameters.

Regulatory Technology (Regtech)

Regtech refers to the use of IT to facilitate and improve regulatory monitoring, reporting, and compliance management. Massive increases in the volume and

types of data that must be reported to regulatory authorities provide a major incentive to automate the compliance and monitoring processes. The objectives of regtech, then, are to facilitate regulatory and compliance reporting processes, enhance transparency and consistency, and reduce cost.

Regtech to date has been focused on digitalization of manual reporting and compliance processes—for example, in the context of Know Your Customer (KYC) requirements.[3] The applications and tools typically used cover identity verification, transaction monitoring and reporting, compliance management and reporting, management of risk data warehouses, regulation gap analysis, regulatory monitoring and reporting, and so on. Hence, regtech has provided significant cost savings to the financial services industry and regulators.

Supervisory Technology (Suptech) Tools

Innovative technologies, together with increased data availability, create scope to strengthen financial supervision. Technological progress offers the potential to radically improve the existing supervisory tools or develop better ones. Suptech is the use of innovative IT by supervisory agencies to effectively implement risk-based supervision, reporting, and regulatory processes, resulting in more efficient and proactive monitoring of risk and compliance for financial institutions. The emergence of suptech is accelerating for many reasons. Among them, postcrisis regulatory reforms have led to an upsurge in reporting requirements, increasing the need for efficient and effective monitoring to benefit from the resulting boost in data availability.

Suptech supports the core objectives of regulation and supervision and could be used to adapt more quickly to a constantly evolving environment. It is currently used mostly for data collection and data analytics. Within data collection, applications are used for supervisory reporting, data management, and virtual assistance. Within data analytics, applications are used for market surveillance, misconduct analysis, and microprudential and macroprudential supervision. Suptech applications for data analytics could potentially transform risk and compliance monitoring from a backward-looking process into a more predictive and proactive one.

Enhanced effectiveness, reduced costs, and improved capabilities are the most cited motivations for developing suptech applications, which enhance effectiveness by improving on traditional or manual processes, thereby allowing for faster supervisory action. They reduce costs by automating processes that typically involve several people and enabling supervisors to sift through

thousands of regulatory filings from supervised entities to identify potential supervisory issues.

At the same time, there are challenges in developing or using suptech applications. The increasing use of suptech exposes supervisory agencies to more risks—such as legal risk, operational risk (including cyber risk), and reputational risk—that must be mitigated if the benefits of suptech are to be maximized. Lack of transparency in some of the data analytics applications is also a critical issue. The use of suptech reinforces the case for further improving risk management at supervisory agencies.

Understanding the capabilities and limitations of innovative technologies, as well as additional requirements, is key to assuring their value added in supervision work. Data standardization, quality, and completeness are all necessary conditions for effective suptech applications. Agencies using suptech recorded a number of potential issues:

- *Inadequate technical and IT capacity*, including issues related to computational capacity constraints and lack of transparency on how some technologies work
- *Incorrect predictions* of vulnerabilities or wrongdoing and data quality issues
- *Possible increase of legal risk*, particularly in the area of data collection
- *Increased operational risks*, including cyber risk, requiring effective risk management in supervisory agencies when using suptech applications.

To explore the potential benefits of suptech applications, supervisory agencies should have a well-defined suptech strategy. They also need to be cautious of a growing data-knowledge gap: On the one hand, data availability, data quality, and data storage facilities are improving rapidly, as are techniques for combining different data sources. On the other hand, data analytics may not be advancing at the same pace. It takes time to learn, develop, and effectively use the new technologies in supervision work. This increasingly interesting topic has been analyzed by a number of international institutions, including in a recent paper from the Financial Stability Institute (FSI) of the Bank for International Settlements (BIS): "Innovative Technology in Financial Supervision (suptech): The Experience of Early Users" (Broeders and Prenio 2018).

Importance of Communication between Regulators and Banks

Regardless of the supervisory approach, it is unusual and also detrimental to a sound banking system when supervisors do not have an ongoing dialogue with

the banking sector senior management teams—and especially with the boards of directors. Such dialogue assists in conveying supervisory expectations and is useful as a mechanism for supervisors to learn from directors with broader financial and other sectoral experience.

17.5 Consolidated Supervision

In line with Core Principle 12 of the BCBS's *Core Principles for Effective Banking Supervision*, an essential element of supervision is that the banking group be supervised on a consolidated basis, applying prudential standards to all aspects of the business conducted by the banking group worldwide. In line with Core Principle 21, the supervisor needs to check that banks have adequate policies and processes to identify, measure, evaluate, monitor, report, and control or mitigate country and transfer risks in their international lending and investment activities on a timely basis. (For a list of all Core Principles, see annex 17A.)

The institutional classification under which a financial intermediary operates has traditionally been assigned based on predominant financial instruments or services offered by the intermediary. This classification designates regulatory and supervisory authorities for particular institutions and the corresponding regulatory treatment—for example, regarding minimum capital levels, capital adequacy, and other prudential requirements such as liquidity and cash reserves.

Increasing financial market integration blurs the difference between various types of financial institutions and increases opportunities for regulatory or supervisory arbitrage, which ultimately increases systemic risk. Although perfect neutrality may not be possible or even necessary, authorities should strive to level the playing field for specific markets and to reduce the scope for regulatory arbitrage. In other words, when different financial institutions compete in the same market for identical purposes, their respective regulations must ensure competitive equality.

The regulatory environments that potentially allow for regulatory (or supervisory) arbitrage display at least one of the following features:

- *Inconsistent or conflicting regulatory philosophies* for different types of financial institutions
- *Deficiencies or inconsistencies in defining risks* and prudential requirements for different types of financial institutions
- *Differences in the cost of compliance* for respective financial institutions
- *Lack of coordination* between regulatory and supervisory authorities in the financial sector.

Consolidated supervision needs to include the cybersecurity elements because it is one of the most important options to address cybersecurity risks. For example, the European Banking Authority requires that supervisors verify whether a supervised institution's risk management framework (a) tests information and communication technology (ICT) availability and continuity against a range of scenarios, including cyberattack; and (b) tests for backup for critical software and data. One of the key issues is that the board members typically lack professional IT experience.

Supervision of Cross-Border Operations

The international expansion of banks increased the efficiency of both global and national markets, but it may have created difficulties during the supervision process. For example, cross-border transactions may conceal a bank's problems from its home-country supervisors. Certain practices by subsidiaries in less-regulated environments could in the past have been hidden from home-country supervisors and may ultimately create losses that could impair a bank's capital. Internationalization could potentially be used as a vehicle to escape regulation and supervision in situations when problem assets were transferred to less-stringent regulatory environments or to areas with less effective supervision. Internationally active banks therefore presented a challenge to supervisory authorities.

Cooperative efforts were needed to ensure that all aspects of international banking are subject to effective supervision and that remedial actions are well coordinated. Home and host supervisors of cross-border banking groups had to share information and cooperate for effective supervision of the group and group entities and for effective handling of crisis situations. Supervisors therefore required that foreign banks' local operations be conducted to the same standards as those required of domestic banks.

The failure of a number of large, internationally active banks spurred the BCBS's issuance of minimum standards for the supervision of such groups, based on the Basel 2012 principles, as follows:

- A capable home-country authority should supervise internationally active banks and banking groups on a consolidated basis.
- The creation of a cross-border banking establishment should receive the prior consent of both home- and host-country supervisory authorities. Such bilateral supervisory arrangements should be specified in a memorandum of understanding signed by both authorities.

- Home-country supervisory authorities should possess the right to collect information concerning the cross-border establishment of the banks and banking groups that they supervise. The collection by and exchange of information between authorities should be guided by principles of reciprocity and confidentiality. Confidential information should be safeguarded against disclosure to unauthorized parties.
- If a host-country supervisory authority determines that the home-country supervisory arrangements do not meet minimum standards, it can prohibit cross-border operations or impose restrictive measures that satisfy its standards.
- Home-country supervisory authorities should inform host-country authorities of changes in supervisory measures that have a significant bearing on the relevant bank's foreign operations.

One of the primary reasons why consolidated supervision is critical is the risk of a damaging loss of confidence and of contagion that extends beyond legal liability. Supervisory arrangements and techniques differ because of legal, institutional, historical, and other factors, so no single set of criteria exists to conclusively establish whether consolidated supervision is effective. In principle, consolidated supervision should assess and consider all risks run by a banking group wherever they occur, including branches and subsidiaries, nonbank companies, and financial affiliates. More specifically, consolidated supervision is expected to support the principle that no banking operation, wherever located, should escape supervision. It also serves to prevent the double leveraging of capital and to ensure that all risks incurred by a banking group (no matter where it is booked) are evaluated and controlled globally.

Efficient cooperation between financial supervisors is also expected to facilitate anti-money laundering (AML) and combating the financing of terrorism (CFT) supervision of financial institutions. The FATF recommends having appropriate legal authority and procedures and mechanisms to collect or solicit as much information as possible from all relevant sources to identify persons and entities that are suspected to be involved in AML/CFT-related violations (FATF 2019). Especially when supervisory authorities share responsibility for financial institutions operating in the same group, they should be able to exchange the following kinds of information when relevant for AML/CFT purposes:

- *Regulatory information,* such as information on the domestic regulatory system, and general information on the financial sectors

- *Prudential information,* such as information on the financial institution's business activities, beneficial ownership, management, and adherence of directors and management to "fit and proper" standards
- *AML/CFT information,* such as internal AML/CFT procedures and policies of financial institutions, customer due diligence information, customer files, samples of accounts, and transaction information.

Financial supervisors should be able to conduct inquiries on behalf of their foreign counterparts.

Consolidated supervision should extend beyond the mere consolidation of accounts. Supervisory authorities should consider the exact nature of the risks involved and design an appropriate approach to assessing them. Consolidated accounting may even be inappropriate when the nature of risk varies—for example, when market risk differs from market to market. The offsetting of market risks during the process of accounting consolidation may result in an inaccurate risk exposure position. Liquidity risk should be considered primarily on a market-by-market or currency-by-currency basis.

The Basel II Accord has significantly extended the scope of multiple approvals. It recognizes the need to develop effective cross-border understandings on the application of capital standards to international banking groups. Effective cooperation and coordination between home- and host-country supervisors is an essential element of its successful implementation. Where a banking group has operations in at least one country other than its home country, implementation of the Basel II and Basel III Accords may require it to obtain approval for its use of certain advanced approaches (for example, the internal ratings-based approach for credit risk or the advanced measurement approach for operational risk) from relevant host-country supervisors on an individual or subconsolidated basis. In addition, the banking group may need approval from its home-country supervisor with respect to consolidated supervision under Basel II. The degree and nature of cooperation between supervisors may differ across these different supervisory responsibilities. Whatever arrangements are employed, banks would also have an important role to play in assisting the supervisors' efforts toward effective, efficient cross-border implementation.

Supervision of Conglomerates

Supervisory arrangements involving conglomerates are even more complex. An international financial group active in banking, securities, fund management, and insurance may be subject to multiple regulatory regimes and supervised by

authorities in multiple countries. Problems related to a conglomerate's information, coordination, and compliance with prudential regulations—which are complex enough in a single-country environment—are compounded at the international level, particularly when operations involve emerging market economies.

Financial conglomerates may have different shapes and structural features, reflecting varying laws and traditions. Key aspects to be considered in the supervision of conglomerates are the overall approach to supervision, the transparency of group structures, the assessment of capital adequacy, and the prevention of double gearing. In addition, contagion, the effect of intragroup exposures, and the consolidated treatment of large exposures play a role because of strong differences in exposure rules in banking, securities, and insurance.

The problem of consolidated supervision has been addressed internationally by the Joint Forum, including representatives of BCBS, the International Organization of Securities Commissions (IOSCO), and the International Association of Insurance Supervisors (IAIS). The Joint Forum provided an initial framework for the supervision of financial conglomerates (the "1999 Principles"), covering capital adequacy assessment; coordination and sharing of information among supervisors; testing the fitness and propriety of managers, directors, and major shareholders; and management and control of risk concentrations and intragroup transactions and exposures.[4] These principles include the following:

- All banks, securities firms, and other financial institutions should be subject to effective supervision, including supervision related to capital.
- Geographically and functionally diversified financial groups require consolidated supervision and special supervisory arrangements. Cooperation and information flow among supervisory authorities should be adequate and free from both national and international impediments.
- The transparency and integrity of markets and supervision rely on adequate reporting and disclosure of information.

The Joint Forum recommended accounting-based consolidation as an appropriate technique to assess capital adequacy in homogeneous conglomerates. This process enables a straightforward comparison, using a single set of valuation principles, of total consolidated assets and liabilities as well as the application at the parent level of capital adequacy rules to consolidated figures. As for heterogeneous conglomerates, the group

recommended a combination of three techniques: the building-block prudential approach (whereby consolidation is performed following solo supervision by respective supervisory authorities), risk-based aggregation, and risk-based deduction.

Consolidated supervision continued to receive international attention leading to updated "2012 Principles," reflecting the updates in the principles frameworks of the Joint Forum's three parent committees (Joint Forum 2012). The new version specifies 29 principles covering 5 aspects: supervisory powers and authority, supervisory responsibility, corporate governance, capital adequacy and liquidity, and risk management. These principles set up new priorities for policy makers and supervisors (viewed as preconditions for effective groupwide supervision of financial conglomerates) and emphasize essential elements of financial conglomerate supervision: the assessment of group risks (for example, contagion, concentration, multiple uses of capital, management complexity, and conflicts of interest) and the minimization of regulatory arbitrage. The principles highlight the need for a clear legal framework that provides supervisors with the necessary powers, authority, and resources to perform—with independence and in coordination with other supervisors—comprehensive groupwide supervision.

The Basel Accords' scope of application also provides specific requirements related to consolidation and supervision of financial conglomerates. The best approaches to supervision and the assessment of capital adequacy continue to receive close international attention. The BCBS encourages the home and host supervisors of the major international financial and banking groups to continue discussions among themselves and with the institutions they supervise. It is important that these group efforts continue to make progress and that home and host authorities build on the working relationships being developed to create effective cooperative mechanisms to implement the Basel Accords.

17.6 Supervisory Cooperation with Internal and External Auditors

Internal auditing has been defined by the Institute of Internal Auditors as "an independent, objective activity that … helps an organization accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes."[5]

The Role of Internal Auditors

Although the importance of a bank's internal audit function has been discussed in chapter 2, it is worth repeating that the function should cover all of a bank's activities in all its associated entities. It should be permanent, impartial, and technically competent; operate independently; and report to a bank's board or to the chief executive officer.

Supervisory authorities normally issue regulatory requirements for banks' internal control systems, aiming to establish some basic principles for the system and quality of controls applied by banks. Although the extent of regulations varies, internal audit and control regulations normally cover policies and procedures for management of credit risk and other core banking risks, such as liquidity management, foreign exchange and interest rate risks, and risk management of derivatives and computer and telecommunication systems. On-site supervision normally includes an evaluation of a bank's internal controls and of the quality of the internal audit function. If satisfied with the quality of an internal audit, supervisors can use the reports of internal auditors as a primary mechanism to identify control or management problems in the bank.

Use of External Auditors

External auditors and bank supervisors cover similar ground but focus on different aspects in their work. Auditors are primarily concerned with fair presentation in the annual financial statements and other reports supplied to shareholders and the general public. They are expected to express an opinion on whether financial statements and other prudential returns (when applicable) fairly present the condition and results of a bank's operations. To express such an opinion, auditors must also be satisfied with a bank's accounting policies and principles and the consistency of their application, and they must be sure that the bank's key functional systems are coherent, timely, and complete.

Because supervisory resources are scarce, to avoid duplication of examination efforts, supervisory authorities have come to increasingly rely on external auditors to assist in the on-site supervision process. Potential reliance on the assessments and judgments of external auditors implies that supervisors have an interest in ensuring high bank auditing standards and that auditors meet certain quality criteria. In many countries, banking regulations require that the banks' external audits be carried out by auditors who have adequate professional expertise available in their firms and meet certain quality standards.

Auditors are often expected to report to the supervisory authorities any failures by banks to fulfill the requirements related to their banking license and other material breaches of laws and regulations—especially where the interests of depositors are jeopardized. In some countries, the external auditors are asked to perform additional tasks of interest to the supervisors, such as to assess the adequacy of organizational and internal control systems as well as the consistency of methods and databases used for the preparation of prudential reports, financial statements, and management's own internal reports.

A supervisor's request to an external auditor to assist in specific supervision-related tasks should be made in the context of a well-defined framework. This process demands, at a minimum, adherence to international accounting and auditing standards.

An important prerequisite for cooperation between the supervisory authorities and external auditors is a continuing dialogue between the supervisory authorities and the national professional accounting and auditing bodies. Such discussions should routinely cover all areas of mutual concern, including generally accepted accounting practices and auditing standards applicable to banks as well as specific accounting problems, such as appropriate accounting techniques to be introduced for specific financial innovations.

Annex 17A: Basel *Core Principles for Effective Banking Supervision,* September 2012

The BCBS's *Core Principles for Effective Banking Supervision* defines 29 principles that are needed for a supervisory system to be effective (BCBS 2012). The initial set of core principles (CPs) was redefined in 2006 and broadly categorized into seven groups of CPs:

1. Mandate, independence and cooperation, enforcement powers (CPs 1, 2, 3, and 11)
2. Licensing, permissible activities, transfer ownership, and major acquisitions (CPs 5–7)
3. Supervisory approach, process, and reporting (CPs 8–10)
4. Consolidated and cross-border supervision (CPs 12–13)
5. Corporate governance (CP 14)
6. Risk management and capital adequacy (CPs 15–25)
7. Controls, audit, accounting, disclosure, and abuse of financial services (CPs 26–29).

The financial crisis of 2008 and other developments in international financial markets triggered the next stage of reforms—including a thorough review of principles and objectives of financial markets supervision—and resulted in the addition of some new core principles. The set of core principles that the BCBS declared in September 2012 now include all of those listed below.

Principle 1: Responsibilities, objectives, and powers. An effective system of banking supervision has clear responsibilities and objectives for each authority involved in the supervision of banks and banking groups. A suitable legal framework for banking supervision is in place to provide each responsible authority with the necessary legal powers to authorize banks, conduct ongoing supervision, address compliance with laws, and undertake timely corrective actions to address safety and soundness concerns.

Principle 2: Independence, accountability, resourcing, and legal protection for supervisors. The supervisor possesses operational independence, transparent processes, sound governance, budgetary processes that do not undermine autonomy and adequate resources, and is accountable for the discharge of its duties and use of its resources. The legal framework for banking supervision includes legal protection for the supervisor.

Principle 3: Cooperation and collaboration. Laws, regulations, or other arrangements provide a framework for cooperation and collaboration with relevant domestic authorities and foreign supervisors. These arrangements reflect the need to protect confidential information.

Principle 4: Permissible activities. The permissible activities of institutions that are licensed and subject to supervision as banks are clearly defined, and the use of the word "bank" in names is controlled.

Principle 5: Licensing criteria. The licensing authority has the power to set criteria and reject applications for establishments that do not meet the criteria. At a minimum, the licensing process consists of an assessment of the ownership structure and governance (including the fitness and propriety of board members and senior management) of the bank and its wider group, and its strategic and operating plan, internal controls, risk management, and projected financial condition (including capital base). Where the proposed owner or parent organization is a foreign bank, the prior consent of its home supervisor is obtained.

Principle 6: Transfer of significant ownership. The supervisor has the power to review, reject, and impose prudential conditions on any proposals to transfer significant ownership or controlling interests held directly or indirectly in existing banks to other parties.

Principle 7: Major acquisitions. The supervisor has the power to approve or reject (or recommend to the responsible authority the approval or rejection of), and impose prudential conditions on, major acquisitions or investments by a bank, against prescribed criteria, including the establishment of cross-border operations, and to determine that corporate affiliations or structures do not expose the bank to undue risks or hinder effective supervision.

Principle 8: Supervisory approach. An effective system of banking supervision requires the supervisor to develop and maintain a forward-looking assessment of the risk profile of individual banks and banking groups, proportionate to their systemic importance; identify, assess, and address risks emanating from banks and the banking system as a whole; have a framework in place for early intervention; and have plans in place, in partnership with other relevant authorities, to take action to resolve banks in an orderly manner if they become nonviable.

Principle 9: Supervisory techniques and tools. The supervisor uses an appropriate range of techniques and tools to implement the supervisory approach and deploys supervisory resources on a proportionate basis, taking into account the risk profile and systemic importance of banks.

Principle 10: Supervisory reporting. The supervisor collects, reviews, and analyzes prudential reports and statistical returns from banks on both a solo and a consolidated basis, and independently verifies these reports through either on-site examinations or use of external experts.

Principle 11: Corrective and sanctioning powers of supervisors. The supervisor acts at an early stage to address unsafe and unsound practices or activities that could pose risks to banks or to the banking system. The supervisor has at his or her disposal an adequate range of supervisory tools to bring about timely corrective actions. This includes the ability to revoke the banking license or to recommend its revocation.

Principle 12: Consolidated supervision. An essential element of banking supervision is that the supervisor supervises the banking group on a consolidated basis, adequately monitoring and, as appropriate, applying prudential standards to all aspects of the business conducted by the banking group worldwide.

Principle 13: Home-host relationships. Home and host supervisors of cross-border banking groups share information and cooperate for effective supervision of the group and group entities and effective handling of crisis situations. Supervisors require the local operations of foreign banks to be conducted to the same standards as those required of domestic banks.

Principle 14: Corporate governance. The supervisor determines that banks and banking groups have robust corporate governance policies and processes covering, for example, strategic direction, group and organizational structure, control environment, responsibilities of the banks' boards and senior management, and compensation. These policies and processes are commensurate with the risk profile and systemic importance of the bank.

Principle 15: Risk management process. The supervisor determines that supervised institutions have a comprehensive risk management process (including effective board and senior management oversight) to identify, measure, evaluate, monitor, report, and control or mitigate all material risks on a timely basis and to assess the adequacy of their capital and liquidity in relation to their risk profile and market and macroeconomic conditions. This extends to development and review of contingency arrangements (including robust and credible recovery plans where warranted) that take into account the specific circumstances of the bank. The risk management process is commensurate with the risk profile and systemic importance of the bank.

Principle 16: Capital adequacy. The supervisor sets prudent and appropriate capital adequacy requirements for banks that reflect the risks undertaken by, and presented by, a bank in the context of the markets and macroeconomic conditions

in which it operates. The supervisor defines the components of capital, bearing in mind their ability to absorb losses. At least for internationally active banks, capital requirements are not less than the applicable Basel standards.

Principle 17: Credit risk. The supervisor determines that banks have an adequate credit risk management process that takes into account their risk appetite, risk profile, and market and macroeconomic conditions. This includes prudent policies and processes to identify, measure, evaluate, monitor, report, and control or mitigate credit risk (including counterparty credit risk) on a timely basis. The full credit life cycle is covered including credit underwriting, credit evaluation, and the ongoing management of the bank's loan and investment portfolios.

Principle 18: Problem assets, provisions, and reserves. The supervisor determines that banks have adequate policies and processes for the early identification and management of problem assets and the maintenance of adequate provisions and reserves.

Principle 19: Concentration risk and large exposure limits. The supervisor determines that banks have adequate policies and processes to identify, measure, evaluate, monitor, report, and control or mitigate concentrations of risk on a timely basis. Supervisors set prudential limits to restrict bank exposures to single counterparties or groups of connected counterparties.

Principle 20: Transactions with related parties. In order to prevent abuses arising in transactions with related parties and to address the risk of conflict of interest, the supervisor requires banks to enter into any transactions with related parties on an arm's-length basis; to monitor these transactions; to take appropriate steps to control or mitigate the risks; and to write off exposures to related parties in accordance with standard policies and processes.

Principle 21: Country and transfer risks. The supervisor determines that banks have adequate policies and processes to identify, measure, evaluate, monitor, report, and control or mitigate country risk and transfer risk in their international lending and investment activities on a timely basis.

Principle 22: Market risk. The supervisor determines that banks have an adequate market risk management process that takes into account their risk appetite, risk profile, and market and macroeconomic conditions and the risk of a significant deterioration in market liquidity. This includes prudent policies and processes to identify, measure, evaluate, monitor, report, and control or mitigate market risks on a timely basis.

Principle 23: Interest rate risk in the banking book. The supervisor determines that banks have adequate systems to identify, measure, evaluate,

monitor, report, and control or mitigate interest rate risk in the banking book on a timely basis. These systems take into account the bank's risk appetite, risk profile, and market and macroeconomic conditions.

Principle 24: Liquidity risk. The supervisor sets prudent and appropriate liquidity requirements (which can include either quantitative or qualitative requirements or both) for banks that reflect the liquidity needs of the bank. The supervisor determines that banks have a strategy that enables prudent management of liquidity risk and compliance with liquidity requirements. The strategy takes into account the bank's risk profile as well as market and macroeconomic conditions and includes prudent policies and processes, consistent with the bank's risk appetite, to identify, measure, evaluate, monitor, report, and control or mitigate liquidity risk over an appropriate set of time horizons. At least for internationally active banks, liquidity requirements are not lower than the applicable Basel standards.

Principle 25: Operational risk. The supervisor determines that banks have an adequate operational risk management framework that takes into account their risk appetite, risk profile, and market and macroeconomic conditions. This includes prudent policies and processes to identify, assess, evaluate, monitor, report, and control or mitigate operational risk on a timely basis.

Principle 26: Internal control and audit. The supervisor determines that banks have adequate internal control frameworks to establish and maintain a properly controlled operating environment for the conduct of their business, taking into account their risk profile. These include clear arrangements for delegating authority and responsibility; separation of the functions that involve committing the bank, paying away its funds, and accounting for its assets and liabilities; reconciliation of these processes; safeguarding the bank's assets; and appropriate independent internal audit and compliance functions to test adherence to these controls as well as applicable laws and regulations.

Principle 27: Financial reporting and external audit. The supervisor determines that banks and banking groups maintain adequate and reliable records, prepare financial statements in accordance with accounting policies and practices that are widely accepted internationally, and annually publish information that fairly reflects their financial condition and performance and bears an independent external auditor's opinion. The supervisor also determines that banks and parent companies of banking groups have adequate governance and oversight of the external audit function.

Principle 28: Disclosure and transparency. The supervisor determines that banks and banking groups regularly publish information on a consolidated

and, where appropriate, solo basis that is easily accessible and fairly reflects their financial condition, performance, risk exposures, risk management strategies, and corporate governance policies and processes.

Principle 29: Abuse of financial services. The supervisor determines that banks have adequate policies and processes, including strict customer due diligence (CDD) rules to promote high ethical and professional standards in the financial sector and prevent the bank from being used, intentionally or unintentionally, for criminal activities.

Annex 17B: Assessment of Supervisory Effectiveness

The assessment process indicating whether and to what extent a supervisory authority meets Basel principles is summarized below. The table indicates whether the supervisory authority has a clear and consistent framework of responsibilities and objectives, the ability to accomplish the objectives, and how effective it is in exercising its functions. The ratings have four levels: compliant, largely compliant, materially noncompliant, and noncompliant. In the lower three categories, there is a distinction as to whether the efforts to improve compliance are under way or not.

Table 17B.1 System of Ratings for Assessment of Supervisory Effectiveness

Name of country:		**Person(s) responsible for completion:**	
Address of supervisory authority:		**Telephone number of counterpart:**	
Date completed:		**E-mail address**	

Assessment ratings - example	
1	Compliant
2a	Largely compliant and efforts to achieve compliance are underway
2b	Largely compliant and efforts to achieve compliance are **not** underway
3a	Materially noncompliant and efforts to achieve compliance are underway
3b	Materially noncompliant and efforts to achieve compliance are **not** underway
4a	Noncompliant and efforts to achieve compliance are underway
4b	Noncompliant and efforts to achieve compliance are **not** underway

#	Summarized description of core principles	Assessment				
		1	2	3	4	n/a
1	Responsibilities, objectives, and powers					
2	Independence, accountability, resourcing, and legal protection for supervisors					
3	Cooperation and collaboration with local and foreign authorities					
4	Permissible activities (use of the word "bank" controlled)					
5	Licensing criteria—for example, assessment of the ownership structure and governance (including the fitness and propriety of board members and senior management) of the bank and its wider group					
6	Transfer of significant ownership—impose conditions					
7	Major acquisitions—impose conditions					
8	Supervisory approach—forward-looking assessment of the risk profile of banks					

continued

Table 17B.1 Continued

9	Supervisory techniques and tools—range					
10	Supervisory reporting—receives reports and validates					
11	Corrective and sanctioning powers of supervisors—address unsafe practices					
12	Consolidated supervision of banking groups					
13	Home-host relationships—share information with other supervisors					
14	Corporate governance—robust corporate governance policies and processes covering, for example, strategic direction, group and organizational structure, control environment, responsibilities of the banks' boards and senior management, and compensation					
15	Risk management process must be comprehensive					
16	Set minimum capital adequacy requirements/components of capital (appropriate for market conditions)					
17	Credit risk covering the full credit lifecycle					
18	Problem assets, provisions, and reserves—early identification					
19	Concentration risk and large exposure limits—satisfied with information systems and limits to restrict large exposures to single or related borrowers					
20	Transactions with related parties—satisfied re practices and procedures for loan evaluation—the quality of assets/loan loss provisions and reserves					
21	Country and transfer risks—adequate policies to monitor					
22	Accurately measure, monitor, and control market risks					
23	Interest rate risk in the banking book—effective systems Identify, assess, and monitor interest rate risk					
24	Liquidity risk—satisfied that banks have in place a liquidity management strategy					
25	Operational risk—identify, assess, and monitor operational risk					
26	Internal control and audit—appropriate independent internal audit and compliance functions to test adherence to controls as well as applicable laws and regulations					
27	Financial reporting and external audit—prepare financial statements in accordance with accounting policies and practices that are widely accepted internationally and annually publish information that fairly reflects their financial condition and performance and bears an independent external auditor's opinion					
28	Disclosure and transparency					
29	Abuse of financial services—know your customer: prevent the bank from being used, intentionally or unintentionally, for criminal activities.					

Table 17B.2 Example and Summary of Basel Core Principles Evaluation

Example: Core Principle 1 (1): An effective system of banking supervision will have clear responsibilities and objectives for each agency involved in the supervision of banks. See also https://www.imf.org/external/pubs/ft/scr/2016/cr16166.pdf.

Essential criteria

1. The responsibilities and objectives of each of the authorities involved in banking supervision are clearly defined in legislation and publicly disclosed. Where more than one authority is responsible for supervising the banking system, a credible and publicly available framework is in place to avoid regulatory and supervisory gaps.

2. The primary objective of banking supervision is to promote the safety and soundness of banks and the banking system. If the banking supervisor is assigned broader responsibilities, these are subordinate to the primary objective and do not conflict with it.

3. Laws and regulations provide a framework for the supervisor to set and enforce minimum prudential standards for banks and banking groups. The supervisor has the power to increase the prudential requirements for individual banks and banking groups based on their risk profile and systemic importance.

4. Banking laws, regulations, and prudential standards are updated as necessary to ensure that they remain effective and relevant to changing industry and regulatory practices. These are subject to public consultation, as appropriate.

5. The supervisor has the power to

a) Have full access to banks' and banking groups' boards, management, staff, and records in order to review compliance with internal rules and limits, as well as external laws and regulations;

b) Review the overall activities of a banking group, both domestic and cross-border; and

c) Supervise the activities of foreign banks incorporated in its jurisdiction.

6. When, in a supervisor's judgment, a bank is not complying with laws or regulations, or it is or is likely to be engaging in unsafe or unsound practices or actions that have the potential to jeopardize the bank or the banking system, the supervisor has the power to

a) Take (and/or require a bank to take) timely corrective action;

b) Impose a range of sanctions;

c) Revoke the bank's license; and

d) Cooperate and collaborate with relevant authorities in an orderly resolution of the bank, including triggering resolution where appropriate.

7. The supervisor has the power to review the activities of parent companies and of companies affiliated with parent companies to determine their impact on the safety and soundness of the bank and the banking group.

Additional criteria

Where applicable…

Discussion:

Notes

1. Under Basel Pillar 2, Principle 2, supervisors are responsible for reviewing a bank's internal capital adequacy assessments and following up as needed.
2. Under Basel Pillar 2, Principle 3, supervisors should specify their expectation for banks to operate above the minimum regulatory capital ratios.
3. Know Your Customer (KYC) refers to customer due diligence standards concerning verification of customers' or clients' identity, often in connection with bank regulations and anti-money laundering regulations.
4. The 1999 papers were grouped into a 2001 BCBS document: "Compendium of Documents Produced by the Joint Forum" (http://www.bis.org/publ/joint02.htm).
5. "About Internal Auditing," Institute of Internal Auditors website: https://global.theiia.org/about/about-internal-auditing/Pages/About-Internal-Auditing.aspx.

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Analyzing Banking Risk: A Framework for Assessing Corporate Governance and Risk Management provides a comprehensive overview of topics focusing on assessment, analysis, and management of financial risks in banking. The publication emphasizes risk management principles and stresses that key players in the corporate governance process are accountable for managing the different dimensions of financial and other risks.

This fourth edition remains faithful to the objectives of the original publication. The new business aspects affecting banking risks, such as mobile banking, and regulatory changes over the past decade—specifically those related to Basel III capital adequacy concepts—have been included, as have new operational risk management topics, such as cybercrime, money laundering, and outsourcing.

This publication will be of interest to a wide body of users of bank financial data. The target audience includes the persons responsible for the analysis of banks and for the senior management or organizations directing their efforts. Because the publication provides an overview of the spectrum of corporate governance and risk management, it is not aimed at technical specialists of any particular risk management area.

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Ministry of Economy and Finance
Republic of Korea

WORLD BANK GROUP

ISBN 978-1-4648-1446-4

SKU 211446