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# FOUNDATIONS OF FINANCIAL RISK

AN OVERVIEW OF FINANCIAL RISK AND RISK-BASED  
FINANCIAL REGULATION

Richard Apostolik

Christopher Donohue



**GARP**

Global Association  
of Risk Professionals

# **Foundations of Financial Risk**

## ***An Overview of Financial Risk and Risk-Based Regulation***

**Richard Apostolik  
Christopher Donohue**

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## **PREFACE**

# **The New World of Banking Banking after the Global Financial Crisis**

The global financial crisis of 2007-2009 will shape the ways **banks** are managed for many decades to come. It will also continue to affect the ways that politicians, regulators, analysts, and the general public think about banks and behave toward them.

Banking crises are not unusual. The Argentinian **currency** revaluation in 2001 led to a crisis for its banks, the Asian financial crisis of 1997 led to the **insolvency** of many of the region's banks, Sweden suffered a banking crisis in the early 1990s, and in the mid-1970s many second-tier British banks suffered huge losses as a result of a collapse in property prices.

Yet the 2007-2009 global financial crisis stands out from other banking crises due to its global extent, its impact on economic growth, and the far-reaching policy responses that have followed it. In all three respects, what happened in 2007-2009 resembles the financial crash and economic depression of the late 1920s and early 1930s more than it does any of the other banking system crises of more recent years.

The events of 2007-2009 challenged many of the widely held assumptions about how banks and banking systems worked. In simple terms, many things that would have been dismissed as unthinkable a few years before actually happened.

For example, it had always been assumed that banks and other commercial institutions would invariably make **liquidity** available to other financial institutions even if they charged very high rates for it. Yet during the days that followed the collapse of Lehman Brothers in September 2008, short-term financing markets dried up as banks refused to extend liquidity at any price. The level of uncertainty in financial markets was such that banks did not want to increase their exposure to anyone else, however strong they seemed to be.

Among the other ideas challenged by the crisis was the distinction between **off-balance-sheet** and on-balance-sheet items, the value of credit ratings, and the ability of many new capital instruments to absorb losses.

More generally, the long-term trend toward deregulation of financial markets that had begun in the 1970s and gathered pace during the 1990s fell out of favor. The belief that bankers themselves best understood the risks that they were taking was discredited. Politicians who had to explain to their voters why the failure of private sector banks had led to higher unemployment and public sector wage freezes wanted to exert control over the way banks operated in the future to try to ensure that a similar global crisis could not reoccur.

As a result, the level of regulation and public scrutiny of banks is far greater today than it has been for many decades, and this is unlikely to change in the near future.

Although the crisis was global in the sense that banks and economies throughout the world were affected, some were affected more than others. Emerging market banks that did not rely on global funding streams and had little exposure to **assets** and **financial instruments** originated in Western economies were barely affected. For example, in 2007-2009, the performance of Egyptian banks was driven

more by the progress of their **central bank's** domestic financial reform program than by events in global financial markets.

Nevertheless, the fact that it was banks and economies in developed markets, particularly the United States and Europe, that were most affected has had far-reaching consequences for banks everywhere. Officials from North American and European countries and from the developed economies of Asia dominate bodies such as the **Basel Committee on Banking Supervision** that set standards for **international banks** and other financial institutions. It was banks from these countries that were most affected by the global financial crisis, so officials from these countries have been determined to put in place new standards—for example, on minimum capital levels and corporate governance—that they hope will reduce the possibility of another global financial crisis happening.

The standards that are set by bodies such as the Basel Committee are applicable to banks worldwide. So, for example, Egyptian banks may have been minimally affected during the financial crisis, but they are now judged against new international standards on bank capital and liquidity just like everyone else.

## **THE EUROPEAN FINANCIAL CRISIS OF 2009-2013**

European banks and financial markets were badly affected by the global financial crisis, but from early 2010 European financial markets suffered additional problems specifically related to economic trends in Europe. These problems particularly affected the **Eurozone**—the group of 17 countries that had adopted the euro as their currency and

whose monetary affairs were therefore governed primarily by the European Central Bank.

The difficulties experienced by European financial markets over this time were the result first and foremost of a sovereign debt crisis arising from unsustainable spending and borrowing by some governments. However, one of the features of the crisis was the close connection that emerged between the sustainability of government finances in a particular country and the health of that country's banking system.

The response to the crisis has had far-reaching consequences for the way in which banks are regulated and supervised in the European Union (EU)— for both Eurozone and non-Eurozone countries.

Ireland was the first EU country to need financial support from the European Union and the International Monetary Fund, although Ireland's problems arose from problems in its banking system that became apparent in 2007-2008, rather than from budgetary difficulties. As a result, the European crisis is deemed to have begun with Greece in 2009.

In late 2009, concerns began to grow that the Greek government would not be able to repay its debts, and in February 2010 the European Union announced a financial support package for Greece that was coupled with requirements that the Greek government drastically reduce public spending. Over the course of 2010, new figures revealed that the Greek government's financial situation was even worse than expected, and further support from international bodies was provided.

Although the Greek crisis originated with problems in the Greek government's finances, it quickly became clear that Greek banks would be affected. Most obviously, they held

large amounts of their own government's bonds, and the government's ability to repay these bonds was now in doubt. Furthermore, as investors worried about the ability of the Greek government to repay its debts, they pushed up the cost of new borrowing to Greece and this in turn led to higher funding costs for Greek banks. More generally, the Greek government's budgetary crisis revealed broader mismanagement within the Greek economy, including state-owned enterprises that were not servicing the loans that they had received from banks.

As the problems in Greece unfolded, analysts turned their attention to other Eurozone countries that had been running large budget deficits, such as Portugal, Spain, and Cyprus. Although the fundamental problems lay with government budgets, banks based in these countries also experienced difficulties either as a result of their direct exposure to their governments, because international investors were refusing to provide funds to any institutions in that particular country, or because the problems at the government level were symptomatic of broader economic mismanagement whose full extent only came to light as a result of the crisis.

The difficulties of resolving the European financial crisis were exacerbated by a lack of clarity over who was responsible for solving the problems. It was clearly in the interest of the Eurozone as a whole to prevent financial collapse in any member country, but some countries were reluctant to commit their own taxpayers' **money** to resolve problems in other countries that had been caused by years of overspending. These issues have now been largely resolved though the implementation of a "banking union" among Eurozone countries, with a central fund to support troubled banks and centralized supervision conducted by the European Central Bank.

The European financial crisis illustrated not only how budgetary problems at the government level lead to problems for individual banks, but also how lack of clarity over who is responsible for resolving banking crises can result in those crises deepening and becoming more widespread.

## **THE RISE OF SHADOW BANKING**

Until recent times, the provision of credit and the collection of **deposits** were performed almost exclusively by banks that were regulated by a central bank or an equivalent institution, and these banks could expect to receive support from their central bank in the event that they ran short of liquidity. In the mid-1980s in the United States, and shortly after that in other developed financial markets, a variety of nonbank institutions and investment vehicles began to conduct many of these banking activities alongside the traditional banks. This network of nonbank institutions and vehicles is known as **shadow banking**.

Examples include finance companies that make loans for specific purposes, such as car purchases; money market mutual funds that offer deposit facilities similar to those offered by banks, but with the prospect of higher returns than banks can pay; financial vehicles that are created by banks to issue short-term commercial paper and invest in longer-dated assets while remaining off the balance sheets of the banks themselves; and special purpose vehicles created to securitize assets such as mortgages and sell them to institutional investors.

Shadow banks perform many of the functions of banks but exist outside the regulated banking industry. A report published by the Federal Reserve Bank of New York in 2010 estimated that in March 2008 the size of the shadow banking industry in the United States had reached USD 20

trillion, almost twice the size of the traditional banking industry.

It was often the case that activities were conducted through shadow banks in order to avoid the regulatory scrutiny accorded to banks and to take advantage of lower capital requirements than those imposed on banks.

One of the many causes of the global financial crisis of 2007-2009 was that regulators and bankers did not understand how important these shadow banking institutions had become to the everyday functioning of financial markets. Since the financial crisis, regulators have moved to impose rules and standards on shadow banking activity as well as reporting requirements that enable them to monitor the extent and influence of shadow banking on global financial markets.

The volume of shadow banking activity declined as a result of the global financial crisis. (The Federal Reserve Bank of New York report mentioned above estimated that the size of the market had fallen to about USD 16 trillion by the first quarter of 2010.) Factors contributing to this decline included reduced activity in securitization markets and the winding up of many structured investment vehicles.

Despite increased regulatory scrutiny, shadow banking is here to stay. As a result, those analyzing banks and financial markets must take account of competitive pressures on banks from nonbank financial institutions, and the effect that the behavior of large nonbank financial institutions could have on the health of a financial system as a whole.



## EXAMPLE

On September 16, 2008, Reserve Primary Fund, a U.S. money market fund, announced that the net asset value of its shares had fallen below USD 1 per share and that it was therefore not able to repay investors in full if they asked for their money back. This was the first time since 1994 that a money market fund was not in a position to repay depositors in full.

Money market funds had grown rapidly in the United States as an alternative to bank deposits. Money market funds offered customers instant access to their money but paid higher interest than that offered by banks. On the eve of the global financial crisis, the amount of money invested in money market funds in the United States was more than the amount of money placed in **commercial bank** deposits. Reserve Primary's asset size of USD 125 billion at the end of June 2008 was equal to that of the biggest and best-known U.S. banks.

Coming just one day after Lehman Brothers had filed for bankruptcy, Reserve Primary's announcement that it had "broken the buck" (meaning that it was not able to repay customers a full dollar for every dollar invested) added to the panic that was engulfing U.S. and international financial markets. The effect was not confined to those investors who had placed their money in Reserve Primary and similar institutions. Money market funds had been major buyers of short-term bonds issued by banks and other financial institutions and as such had been important providers of liquidity to the financial system as a whole. As investors withdrew their money, the funds were no longer able to buy new financial instruments and as a result liquidity tightened across the financial system.

The difficulties of Reserve Primary also demonstrated the effect of **interconnectivity** and **contagion** in financial markets (see next section). Reserve Primary had bought large amounts of bonds issued by Lehman Brothers. When Lehman declared bankruptcy, signaling that it would not be able to repay its investors, Reserve Primary knew that it would not be able to fully repay its own investors.

## INTERCONNECTIVITY AND CONTAGION

As international financial markets have become larger and more complex in recent decades, they have become interconnected, and the risk of contagion has increased (see Section 3.2.1). For example, a banking crisis in one country, or even problems within a single large institution, can lead to problems in other countries and other institutions. Although problems can arise as a result of direct financial relationships—for example, when the failure of Lehman Brothers led the Reserve Primary money market fund to announce that it would be unable to pay investors in full—they can also arise as a result of perceptions and fear rather than actual financial exposure and risk.

For example, when Thailand devalued its currency in mid-1997, banks and investors began withdrawing money not only from Thailand but also from other Southeast Asian countries. In the aftermath of the crisis questions were raised about the strength of these other Southeast Asian economies, but in most cases the withdrawal of investment funds from these countries and the currency crises that they suffered were triggered directly by investors' fear that what was happening in Thailand might also happen in neighboring countries. In effect, investors did not want to

run the risk that other regional economies might be harboring the same problems that had appeared in Thailand, but when they took the initiative to reduce their exposure, they precipitated the very crisis that they were seeking to avoid.

As financial systems become more international (for example as a result of companies and banks in one region raising bonds and deposits from investors in other regions) and electronic payment systems become more sophisticated, the ability of banks and investors to move money quickly from one place to another is increasing. In turn, this increases the risk that problems in one region will spread quickly to others.

## **INTERNATIONAL BANK REGULATION**

The global financial crisis discredited the approach, prevalent before the crisis, that banks and banking systems work best if regulation and supervision are kept to a minimum. (In the United Kingdom this approach was known as “light touch” regulation and supervision.) As a result, the years since the crisis have seen a large number of initiatives to extend the scope of financial regulation worldwide and to intensify the scrutiny imposed on banks. This new regulatory landscape will continue to govern how banks are run well after memories of the crisis have faded and the people who were running banks at the time have retired.

Efforts to reform the global financial system were initially led by the **G20** group of developed market economies. Finance ministers and central bankers from the G20 countries set the agenda, defined the priorities for financial market reforms, and delegated specific tasks to more specialized bodies, such as the Basel Committee on Banking Supervision (whose work has included new capital

and liquidity standards for banks) and the **International Organization of Securities Commissions (IOSCO)** (whose work has included new rules on how to trade financial instruments). The **Financial Stability Board** has also undertaken work on issues such as **corporate governance** and best practices for bankers' pay. Standard setters, such as the Basel Committee, do not have the power to enforce their recommendations. Their recommendations carry a lot of weight, because they have been drawn up by representatives from many countries after a lot of consultation, but to take effect they need to be incorporated into the laws and regulations of individual countries.

In the United States, many of the new standards governing financial activity were defined in the Dodd-Frank Wall Street Reform and Consumer Protection Act (named after the two congressmen who sponsored the legislation), although the process of writing the detailed rules is delegated to specialized agencies such as the Federal Reserve Bank and the Securities and Exchange Commission. In Europe, new standards have been adopted by the European Union and then transmitted down to the Union's member states through directives and regulations.

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# Introduction

This textbook, previously published in 2009 as the *Foundations of Banking Risk* has been revised, updated and expanded. GARP has renamed the book to reflect the additional content which includes a new chapter on insurance risk.

The role of **risk management** is becoming more important as banks, insurance firms, and supervisors around the world recognize that good risk management practices are vital, not only for the success of individual firms, but also for the safety and soundness of the financial system as a whole. As a result, the world's leading supervisors have developed regulations based on a number of "good practice" methodologies used in risk management. The banking regulations, outlined in the International Convergence of Capital Measurement and Capital Standards, known as the Basel Accord, and the insurance regulations, known as Solvency 2, codify such risk management practices.

The importance of these risk management methodologies as a basis for regulation is hard to overstate. The fact that they were developed with the support of the international financial community means that they have gained worldwide acceptance as the standards for risk management.

The implementation of risk-based regulation means that staff, as well as supervisors, will need to be educated and trained to recognize risks and how to implement risk management approaches. Consequently, GARP offers this program, the *Foundations of Financial Risk*, to provide staff with a basic understanding of banking, banking risks,

insurance risks, **regulation** and supervision. This study text has been designed to assist students in preparing for the *Foundations of Financial Risk* assessment exam. It is presented in a user-friendly format to enable candidates to understand the key terms and concepts of the industries, and their risks and risk-based regulation.

This study text concentrates on the technical terms used in banking and risk management, while providing an insight to the similar risk in the insurance industry. These terms are defined either in the text or in the glossary. As the material is at the introductory level, candidates are not expected to have a detailed understanding of risk management or significant experience in banking. In this text, they will gain an understanding of the commonly used terms in the finance industry.

Each chapter contains a number of examples of actual financial events, as well as case study scenarios, diagrams, and tables aimed at explaining banking, banking risks, and risk-based regulations. This study text has adopted the standard codes used by banks throughout the world to identify currencies for the purposes of **trading**, settlement, and displaying of market prices. The codes, set by the International Organization for Standardization (ISO), avoid the confusion that could result as many currencies have similar names. For example, the text uses USD for the U.S. dollar, GBP for the British pound, EUR for the euro, and JPY for the Japanese yen.

# CHAPTER 1

## Functions and Forms of Banking

Chapter 1 introduces **banks** and the banking system: their roles in facilitating economic activity, and their relevant risks banks face. The three core banking functions—collecting deposits, arranging payments, and making loans—and their attendant risks are described. As this chapter intends to provide a foundation for the more detailed discussions in subsequent chapters, most of the key topics are presented within a risk management framework. A glossary is provided at the end of the book.

### *Chapter Outline*

- 1.1 Banks and Banking
- 1.2 Different Bank Types
- 1.3 Banking Risks
- 1.4 Forces Shaping the Banking Industry

### *Key Learning Points*

- Banks provide three **core banking services**: deposit collection, payment arrangement, and loan **underwriting**. Banks may also offer financial services such as cash, **asset**, and risk management.
- Banks play a central role in facilitating economic activity through three interrelated processes: **financial intermediation**, **asset transformation**, and **money creation**.
- **Retail banks** primarily serve retail customers, and **wholesale banks** primarily serve corporate customers.



A country's central bank sets monetary policy on behalf of the country's government, liaises with other central banks, and may act as the bank regulator. Sometimes a body other than the central bank is responsible for the regulation of individual banks.

- The main risks that banks face are credit, market, operational, and **liquidity risks**. Other types of risk include business, and **reputational risk**. As economies, banks, and societies as a whole develop and change, the risks faced by banks may also change, and new risks may emerge.
- Multiple forces shape the banking industry, including regulation, competition, product innovation, changing technology, and the uncertainty surrounding future interest and **inflation rates**.

## FUNCTIONS AND FORMS OF BANKING

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### 1.1 Banks and Banking

To understand banking risk and regulation, it is important to understand the range of services banks provide and the key role that banks play in a modern economy.

#### 1.1.1 Core Bank Services

Banks offer many products and services. While there is variation among banks and across regions, the core services that banks traditionally provide are:

- **Deposit collection**—the process of accepting cash or money (deposits) from individuals and businesses

(depositors) for safekeeping in a bank account, available for future use.

- **Payment services**—the process of accepting and making payments on behalf of the customers using their bank accounts.
- **Loan underwriting**—the process of evaluating and deciding whether a customer (**borrower**) is eligible to receive credit and then extending a loan or credit to the customer.

As banking has evolved, the complexity of the three core banking functions has increased. For instance, in early banking, depositors received a certificate stating the amount of money they had deposited with the bank.

Later, deposit certificates could be used to make payments. Initially a cumbersome process, the concept of using deposit certificates for payments further evolved into passbooks, checks, and other methods to conveniently withdraw deposits from the bank. Today, deposits, withdrawals, and payments are instantaneous: withdrawals and payments can now be made through debit cards, and payments are easily made via electronic fund transfers (EFTs). See [Figure 1.1](#) for examples of bank products and the services each provides.