Bank Regulation and Resolution of Banking Crises

Unit 1 Elements and Objectives of Bank Regulation

Contents

Unit Overview

Unit 1 introduces the major concepts involved in bank regulation. It begins with an outline of banking crises because, it is argued, major developments in bank regulation have been prompted by experience of the costs resulting from bank crises. The central parts of the unit use a simple model of a basic bank and the liquidity risk and credit risk it carries in order to explore the nature of bank regulation. The principal regulatory techniques explored are *liquidity ratios* and *capital adequacy requirements*, especially *risk-adjusted capital adequacy*. On those foundations the unit then explores some of the differences between the basic bank model and the actual operations of modern complex banks.

Integral to this unit's study material covering those topics are the core readings prescribed. My strong advice is that you plan your work carefully to ensure that you have enough time to study the reading set here thoroughly. That might mean that you skim-read Section 2 and read other early material quickly.

Learning outcomes

When you have completed this unit and its associated reading, you will be able to:

- recount the historical frequency of financial crises and the difference between banking crises and other types of financial crisis
- identify similarities and differences between regulation of other industries and regulation in banking
- discuss the meaning of prudential regulation – in particular, prudential regulation to address liquidity risk and to address credit risk
- give an account of risk-adjusted capital adequacy, and leverage ratio requirements
- outline two objectives of regulation – to influence the amount of risk, and influence who bears the risk
- discuss some aspects of the growth of links between banking and financial markets in the late 20th century and early 21st century
- characterise banking in the pre-2007 boom and regulators' perception of it when the 2008 Global Financial Crisis exposed the failure of regulation.

Reading for Unit 1

Allen N Berger, Philip Molyneux and John OS Wilson (2014) *The Oxford Handbook of Banking*, Chapter 1 'Banking in a Post-Crisis World'.

1.1 Introduction

The regulation of banks within the wider financial system has been a hot topic since the financial crisis that broke in 2008. Serious symptoms of crisis emerged in the US and the United Kingdom in 2007, but multiplied into widespread financial collapse in 2008. Therefore, in this module we refer to the 2008 financial crisis or Global Financial Crisis (GFC), while recognising that its start was earlier and financial problems that it initiated have continued for several years.

Since the 2008 GFC, bank regulation has been at the front of public debate.

Questions rose to the top of people's coffee bar talk:

- How come nobody saw the crash coming?
- Why didn't they do something to stop the sub-prime scams?
- Why didn't regulators prevent the banks' excessive build-up of leverage?

And since the 2008 GFC, interminable meetings of bankers, governments and intergovernmental committees have spent unprecedented person hours wrestling over the technical details of constructing better systems of regulation.

Until these years bank regulation was largely out of sight, a matter for specialists and special interests rather than heads of state and headline writers. Most people assumed that 'someone is in charge', and bank regulators would just get on with keeping watch. In fact, it wasn't always so. Surprisingly, the systems that underpinned the assumption that someone is clearly in charge are relatively recent.

Until America's Banking Act of 1933 no depositor in a US bank could have been assured of clear regulatory oversight, for there had been a century of wrangling and uncertainty over the roles state and national authorities had over banks and money issue. And in the United Kingdom, the first legislation giving the Bank of England regulatory powers was passed only in 1979 (previously it had exerted only informal authority in the City of London as the 'venerable leader of the club').

Both of those major steps forward in bank regulation were prompted by banking crises. In the United States, the 1933 Act was almost the first initiative passed by Congress under the incoming President Roosevelt and followed widespread bank failures in 1931, 1932 and 1933. In the United Kingdom, the 1979 Banking Act was a response to the failure between 1973 and 1975 of financial firms that had been acting like banks without proper regulation. Those landmark examples fit the general pattern – major reforms to strengthen regulation generally occur in response to banking crises.

The Global Financial Crisis originated in the United States and then spread to the United Kingdom as well as to other European states. The shock was felt world-wide and it triggered the deepest economic recession since the 1930s. The modern crisis, too, prompted a renewed wave of efforts to reform bank regulation and take measures to promote the stability of financial systems.

The crisis came to a head when Lehman Brothers, an American bank, filed for bankruptcy on 15 September 2008, and wholesale credit and derivatives markets – which linked banks across the world – effectively suspended normal operation. The sign that this would stimulate an unprecedented review of bank regulation and financial stability is this. In April 2009 the leaders of the twenty largest economies (19 heads of state, plus the European Union) – the G20 – met to address the economic crisis and the feared sustained drop in output, trade and employment. The results seemed ground-breaking. Summit meetings of national leaders had previously been best known for tackling issues like nuclear disarmament. High on the agenda of this meeting of the G20, a relatively new economic grouping, was a commitment to major reform of the financial system and its regulation.

The leaders of the G20 stated in April 2009:

> Major failures in the financial sector and in financial regulation and supervision were fundamental causes of the crisis. Confidence will not be restored until we rebuild trust in our financial system. We will take action to build a stronger, more globally consistent, supervisory and regulatory framework for the future financial sector, which will support sustainable global growth and serve the needs of business and citizens.
>
> Source: Leaders' Statement, G20 Summit, London 2 April 2009

That commitment by world leaders endorsed attempts at regulatory reform that were already under way. Subsequent years have seen major proposals for change, amounting to radical restructuring of how banks and the financial system are regulated. And they have revealed intractable problems. As you begin your study of this module, controversies over regulatory changes continue. Thus, the topics covered in each unit engage with issues that are both alive and important.

1.2 Bank Failures and Banking Crises

What is the purpose of bank regulation? Or, more accurately, what are its *purposes*?

We will turn to that question soon. For now, please note that reducing the risk of banking crises is only one of them. Nonetheless, since banking crises have been major drivers of regulation-strengthening reforms, it is useful to start with an overview of them.

To start, we must be clear on the difference between a banking crisis and the failure of an individual bank.

Banking crises are crises of a banking system. They occur when there is a failure or near failure of banks (or bank-like financial firms) that put in jeopardy many deposits of a country's savers, credit to businesses and consumers, or the operation of the country's payments systems. They may involve the failure of one large bank alone, or several, or many small banks. In today's highly integrated financial systems, banking crises are likely to involve a

bank's failure having spill-over effects causing failures to ripple across the banking sector both at home and abroad.

The failure of an individual bank that has no significant implications for banking and finance as a whole might be experienced as a personal crisis for depositors, bond holders and shareholders who lose money, but does not amount to a banking crisis.

The most prominent role for bank regulators and supervisors – *prudential regulation* – focuses directly on individual banks. As you will see in this module, they are concerned with each individual bank's adherence to required balance sheet ratios and other regulations. In other words, they have oversight of the risks of individual banks failing. The banking crises that have shaken economies have surely given new impulse to the reform of prudential regulation focusing on individual banks, but the Global Financial Crisis has in particular called for regulation of risk that originates from individual behaviour but whose consequences bear on the whole financial system (so called 'systemic risk') – and of risk that increases in booms because of banks' imitative optimising behaviour (so called 'procyclicality'). Both dimensions make up *macroprudential regulation* (or 'macropru' for short), which will be introduced in Unit 4.

1.2.1 How many banking crises have there been? (Reinhart and Rogoff)

We have mentioned five so far: the US banking crises of 1931, 1932 and 1933, the UK crisis of 1973–75, and the Global Financial Crisis of 2008. Is that it?

Unfortunately, not. At the same time as the Global Financial Crisis was unfolding, Carmen Reinhart and Kenneth Rogoff, economics professors at the University of Maryland and Harvard University respectively, were completing a magisterial study of financial crises from the 13th century to 2008. The timely publication in 2009 of their book, *This Time is Different: Eight Centuries of Financial Folly*, had a simple lesson for those puzzling over the recent banking crisis. The lesson was this. Although the 2007–08 crisis was big and had features that had not been seen before, it was one in a long series of banking crises that had hit a wide range of countries in modern times.

Let us look at Reinhart and Rogoff's main conclusions:

1. Counting the number of banking crises that each of 66 countries has experienced since 1800 (or, for younger countries, since independence) they note:

   > *For the advanced economies over the full span, the picture that emerges is one of serial banking crises*. The world's financial centres – the United Kingdom, the United States, and France – stand out in this regard, with 12, 13 and 15 episodes of banking crisis since 1800, respectively. The frequency of banking crises dropped off markedly for the advanced economies and the larger emerging economies alike after World War II. However, all except Portugal experienced at least one post-war crisis prior to the recent [2007–08] episode […] [T]here are no significant differences in either the

incidence or the number of banking crises between advanced and emerging economies; indeed banking crises plague both sets of countries (Reinhart & Rogoff, 2009: pp. 150–53).

2. Recent decades witnessed several major banking crises in advanced countries, banking crises that had major effects on the government's budget or the country's economic growth. Before the 2007–08 crisis and its aftermath saw the collapse or debility of the banking systems of the US, UK, Ireland, Iceland and several other European countries, advanced economies had been shaken by major banking crises surprisingly often in the preceding two and a half decades. Here are some of the main examples (from Reinhart & Rogoff, 2009: pp. 348–92):
   - In *Sweden*, between 1991 and 1994, five of the six largest banks were insolvent or faced difficulties.
   - In *Finland*, over the same period, following the collapse of a large bank, the government took control of three banks accounting for 31 per cent of deposits.
   - In *Spain*, from 1978 to 1983, many small banks had solvency problems and the central bank intervened in 52 banks out of 110; they accounted for 20 per cent of deposits.
   - *Japan*'s banking crisis from 1992–97 had lasting effects on the economy and resulted in seven banks being nationalised, sixty-one financial institutions being closed, and twenty-eight institutions merged.
   - In the *United States*, the specialised saving and mortgage banks known as savings and loan institutions (or 'thrifts') and many other banks failed in a rolling crisis between 1984 and 1991. Reinhart and Rogoff summarise this great crisis as involving 1300 bank failures and the failure of 1400 savings and loan institutions.
3. Banking crises have large economic costs. One indicator of the costs is the subsequent rise in government debt. Governments' borrowing may increase because of three responses to the crisis:
   - governments bail out the banking system (for example, by injecting capital or buying banks' bad assets)
   - tax revenues decline because the banking crisis causes economic recession
   - governments sometimes attempt to counter post-crisis economic recession by adopting discretionary fiscal stimulus policies such as expenditure increases.

   Reinhart and Rogoff calculate that, due to such effects, banking crises are, on average, followed by a near doubling of the stock of real government debt within three years (although the full causes need more refined analysis). There is no systematic difference between emerging and advanced countries in those relative costs.
4. Banking crises are not the only type of financial crises that countries suffer. Reinhart and Rogoff study the history of a number of types of financial crises suffered by countries. They include:

- external sovereign debt default (default on government debt held by non-residents)
- domestic sovereign debt default
- currency crashes (sudden large falls in the nominal exchange rate of the currency)
- inflation outbursts (periods of high or very high inflation which reduces the real value of the currency)
- banking crises.

Episodes of serious financial turmoil can include several types combined.

5. Banking crises are often preceded by booms in housing prices, which slowdown and reverse around the time of the banking crisis. The 'magnitudes of the declines in real housing prices around banking crises from peak to trough are not appreciably different in emerging and advanced economies' (Reinhart & Rogoff, 2009: pp. 160–61). The long period before housing prices recover after the crisis is paralleled by the long duration of banking crises. This is because real estate in general, and housing in particular, is the basic collateral for loans and when this asset depreciates, the supply of credit dries up. In general, it takes countries longer to recover from a banking crisis than from other financial crises, such as a currency crash.

Major banking crises have stimulated attempts at major reforms of bank regulation. In this module you will study the reform efforts prompted by the Global Financial Crisis and others. But before proceeding in the present unit, I would like you to think about what bank regulation means.

Review Question 1.1

- What is the final aim of bank regulation?

Or, in other words,

- What is regulated by bank regulators?

1.3 Is Bank Regulation Different from Regulating Non-Financial Firms?

I wonder how you answered the question 'What is regulated by bank regulators?' There are many ways to do it. The basic answers I suggest in this section are useful for setting the stage to understand the more complex aspects of bank regulation that you will study in the module.

1.3.1 General types of regulation

Capitalist economies are characterised by markets which are not always perfect – *ie* able to self-regulate. This is why governments create regulations and regulators for several types of industry, restricting how agents are supposed to operate in those markets and industries. The objective is generally to

ensure that the social benefits generated by that industry are maximised, which is not necessarily the ultimate outcome of a self-regulated market. But is banking just the same as any other industry, or does it warrant a special type of regulation?

In non-banking industries regulatory bodies may have a multi-task mandate. Consider these three examples:

- Private monopolies supplying a socially important good, such as clean water in a locality, are subject to a regulator which has the power to set the prices charged for water (restricting the power to set monopoly prices).
- A regulator of any industry may have powers to ensure an adequate degree of competition within a sector, to ensure that pricing is competitive. This is usually the case of networks (motorways, rails, sewage, telecoms …) where the effect of competition on fair pricing is hampered by the economies of scale that dramatically reduce the number of incumbents in these markets (or induce them to collude).
- Regulators in particular industries may use licensing powers to ensure the quality of the products sold (pharmaceuticals, for example).

Is banking regulated in any of those three dimensions:

- price regulation?
- promoting diversity and competition?
- regulating product quality and safety?

Is *price regulation* relevant to banks?

The answer is that it has been, but has been widely abandoned since the 'de-regulation wave' that has predominated from 1980, as vividly told by Stiglitz (2010).

The core business of commercial banks is to sell liabilities in the form of deposits – that are short-term – and give credit in the form of loans both at short- but mostly long-term. Trying to bridge this maturity mismatch is their business. A price is paid for deposits (interest payments to depositors, although on checking deposits this may be zero and replaced by other benefits), and an interest rate is set as the price charged for credit. In some advanced capitalist countries, regulations have placed ceilings on bank deposit interest rates until recently. Notably, in the United States, Regulation Q imposed ceilings on the interest rate banks paid on savings accounts until it was phased out following a change in the law in 1980, and Regulation Q imposed a ceiling of zero on the interest rate paid for bank deposits until abolished in 2011.

Regulations imposing a ceiling on the interest rate that banks charge for credit are now rare but are used in some countries. Until late in the 20th century they were more common, in the form of so called 'anti-usury' laws, and in the United States most individual states still have local anti-usury laws applying to some types of credit, although under federal law banks are exempt.

Are bank regulators concerned with *competition and diversity*?

They may be.

Until the late 20th century, bank licensing and regulation in most countries was designed to restrict competition by maintaining strict demarcations between different types of financial institutions. For example, in the United States the Glass-Steagall Act (Banking Act, 1933) required separation of commercial banking and investment banking (and insurance companies), and the ability of banks to compete across state boundaries or by branch expansion was restricted. And in the US and UK, competition between commercial banks and savings and mortgage banks (Savings and Loan institutions in the US and Building Societies in the UK) was restricted.

The 1980s and 1990s witnessed major regulatory changes in many countries. In America and Britain old regulations restricting competition between

financial institutions were abolished. In the United States parts of the Glass-Steagall Act were repealed in 1999; in the United Kingdom, the 'Big Bang' of 1986 abolished restrictions on investment banks' activities in securities markets and enabled foreign competitors to enter, and legislation that year enabled building societies to compete with (and become) banks; and financial sector reforms in many emerging markets led to new banks, challenging existing monopolistic banks, being licensed.

But promoting competition is not straightforward and not necessarily the role of designated bank regulators. In banking crises, regulators are likely to attempt to resolve some banks' problems by engineering bank mergers and consolidation, which reduces competition. (In a later unit you will study examples of such resolution.) And enforcement of competition may be undertaken by anti-trust authorities instead (as when, in 2009, the European Commission competition authority required Lloyds – a UK banking group – to divest itself of 632 branches).

Are bank regulators concerned with the *quality of the products* sold?

The core products sold by a simple bank are deposits and loans, and each type of deposit or loan has particular characteristics that define it as a product. Modern systems of bank regulation regulate banks' 'conduct of business' to protect retail customers by ensuring that the terms and character of the deposit or loan meet quality standards.

Those qualities are inseparable from the process of selling a deposit or agreeing a loan. Sound 'conduct of business' might involve an obligation on banks to ensure, for example, that a borrower's realistically expected net income is adequate to support the agreed payments schedule. More generally, it involves oversight of the information the bank provides, ensuring that a customer investing in a deposit or accepting a loan receives information that is accurate, transparent and fully explained.

1.3.2 Prudential regulation

The dominant task of bank regulators is a special type of oversight – prudential regulation or, broadly, the regulation of banks' management of risk. In the preceding paragraphs I have outlined how what bank regulators regulate does have parallels with what regulators of other industries cover. But prudential regulation is the special focus of regulation of banks (and the concern of regulators of other financial entities such as insurance companies).

Prudential regulation is both the most prominent task of bank regulators and, at the same time, its design is the most difficult and most controversial. Its objective is, broadly, to regulate the ways in which banks manage risk and its potential effects on banks' different stakeholders.

The breadth of that definition obscures the complexity of prudential regulation and the details of how it can be done. In this module you will study those details from the perspective of both principles and actual practice, illustrated by case studies. I expect that you will notice one characteristic that recurs in every element: prudential regulation and each measure designed to put it into effect is difficult.

Difficulties arise in principle and in practice. Therefore, it can never be a matter of policy makers identifying a problem (exposed, for example, by the most recent banking crisis), designing a prudential regulation measure to overcome it, and having confidence that it can be implemented and produce desirable effects.

Why is prudential regulation difficult? During this module you will face some of the detailed complexities and a range of explanations for them. I think that the most basic is this:

- a fundamental reason for banks' existence is their ability to undertake financial risk.

In a market economy all individuals and firms deal with financial risks – such things as the risk of interest rate changes on their debts, or changes in the value of their pension fund. But banks undertake and manage risk as one of their principal activities and sources of profit. That makes banks quite different from firms carrying out other activities such as manufacturing for profit; manufacturers deal with risk as a condition affecting their main activity, not risk management as their central business itself.

Prudential regulation limits the ability of banks to profit from indefinitely expanding their holdings of risk assets, but it does not even try to eliminate risk (for that would eliminate banking). As banks dynamically come up with new ways to manage risk profitably there is a built-in tension with prudential regulation which is continually generating new challenges.

1.4 Prudential Regulation for a Basic Bank

Let us now begin to put some flesh on that general perspective by engaging with the details of prudential regulation. We shall start to look at the details in the context of a simplified model of a basic retail bank. In Section 1.6, I shall introduce additional elements that enable us to consider a model of a bank that is more realistic. But the basic bank model in this section enables us to isolate some basic elements of prudential regulation.

At the heart of prudential regulation is the bank's balance sheet. For a basic (*ie* simplified) retail bank, the main items in the assets and liabilities sections of the balance sheet, including some hypothetical values, are shown in Table 1.1.

Table 1.1 Basic Bank Balance Sheet

	Currency unit million
Assets	
Cash and other liquid assets	100
Loans	900
Total assets	**1000**
Liabilities	
Deposits	800
Debt	100
Equity	100
Total liabilities	**1000**

In the course of its business, a basic retail bank faces many types of risk (including interest risk and operational risk), but the basic issues confronting regulators can be understood by focusing on two main types of risk: *liquidity risk*, and *credit risk*.

1.4.1 Liquidity risk

This arises from the mismatch between the maturity of the bank's assets and its liabilities.

The sharpest example is the mismatch between its customers' deposits, and its loans. The former are liabilities that are repayable instantly or at short notice. The latter include assets such as medium-term loans or mortgages that cannot be recalled at short notice; in the simplified case of a basic bank we also assume that such assets cannot be sold on a market to raise cash. (In reality, developed financial systems, when working smoothly, do enable such assets to be sold through techniques such as *securitisation.* However, our assumption that they cannot be sold does fit the majority of banks around the world and enables us to focus on the basic model.)

The mismatch between short-term liabilities and long-term assets is regarded as an integral feature of banks. One reason that banks exist is that through this mismatch they carry out the function of maturity transformation. Ideally, maturity transformation enables customers to hold their

savings in the form of deposits that have the desirable property of having liquidity while banks use those deposits to finance longer-term lending that finances real investment by firms and households.

Maturity transformation means that banks practice fractional reserve banking. Fractional reserve banking is reflected in the balance sheet. The reserves of cash and other liquid assets they hold are a small fraction of their total liabilities. In particular, they are a small fraction of the deposits. Thus, although the bank is obliged to pay depositors on demand or at short notice, the reserves of cash and liquid assets available to make those payments is a fraction of the total.

Fractional reserve banking is one source of liquidity risk. If a run on the bank were to occur, when many depositors seek to withdraw large net sums in a short period, the cash and liquid asset reserves might not be adequate to meet the demands. As you will see in Section 1.6, modern banks might obtain liquidity by borrowing from credit markets (replacing deposits with debt on the liabilities side of the balance sheet), but that is not always possible, and in our basic bank model we do not consider it.

Liquidity ratio regulations

Liquidity risk of that type is a major concern for bank regulators. Following the GFC, international regulatory proposals (Basel III, which you will study in Unit 2) have particularly given attention to limiting the liquidity risk in large international banks that are judged to be systemically important. And in many countries national regulators impose minimum liquidity ratios on banks irrespective of their systemic significance. Thus, regulators have an interest in ensuring that banks' reserves of cash and liquid assets are not 'too small' in relation to their deposits or total liabilities; they should have an adequate liquidity ratio.

But there are two questions relating to the regulation of banks' liquidity ratios:

1. *How small is 'too small'?* How large should the liquidity ratio be? Some bloggers and commentators have argued (for several reasons – not only the elimination of liquidity risk) that all deposit liabilities should be backed by cash reserves. The idea has no mainstream support and is not relevant for bank regulators, for the abolition of fractional reserve banking would involve demolishing the banking system.
2. *Why should regulators set minimum requirements for banks' liquidity ratios?* Why not leave it to the banks to choose their own liquidity ratios? After all, presumably the banks want to avoid liquidity risks that are 'too high'. High liquidity risk means a high probability that the bank will not be able to meet depositors' demand for cash or for payments transfers when unusually large total net payments are requested – a 'bank run'. That would cause the end of the bank's business model. Although bank runs are rare, banks with a 'too low' liquidity ratio may lose business because public knowledge of it will deter risk-averse depositors. So why not assume that banks themselves will want

to avoid liquidity ratios that are 'too low' (liquidity risks that are 'too high'), making regulation unnecessary?

In this unit (Section 1.6), in Unit 2 and elsewhere we look at how regulators approach those questions in the real world where banks are more complex than the simple basic bank model.

1.4.2 Credit risk

This is the risk that the bank's borrowers will not pay the principal or interest on their loans on the due dates. A default on the interest or principal payments reduces the real value of the basic bank's main assets – its loans. In economic terms, such a default involves a loss (or reduction in net profits) for the bank and, under appropriate accounting conventions, that loss would be measured as an 'impairment' in the bank's accounts.

Therefore, credit risk is a risk of loss in the bank's income statement. If enough such losses occur in a period, the total can cause the bank to become insolvent. So avoiding high levels of credit risk reduces the probability of the bank suffering insolvency.

Regulatory authorities can approach credit risk in two complementary ways – by regulating lending practices and by regulating capital adequacy.

Regulating lending practices

The first method of limiting credit risk is by imposing restrictions on the bank's lending practices. For example, regulators might, and often do, regulate the loan-to-value ratio in mortgage lending. Thus, they might require that when giving mortgages, the loan is no greater than a certain percentage (say, 80 per cent) of the mortgaged property. Such regulation is in contrast to the situation during the recent boom up to 2007 when some banks in the UK offered mortgages of more than 100 per cent of the property's value.

More general attempts to limit credit risk include regulators' supervision of banks to be satisfied that banks' credit risk evaluation practices are sound.

But no regulatory action can eliminate credit risk, for the banks' function as financial intermediaries within a market economy is to hold risky assets (make loans which have some risk attached) while financing them by attracting savings from customers who want to hold zero (or low) risk bank liabilities in the form of deposits. Moreover, in a competitive market economy, regulators cannot tell banks what levels of total credit risk they should choose. Since banks' profits partly stem from undertaking risk, that is seen as a business decision for the banks to make themselves. In the face of those limits on regulators' actions, a second approach has been adopted and is at the centre of debates and policy actions: risk-adjusted capital adequacy regulations.

Regulating capital adequacy

The second approach to regulating credit risk involves setting rules for banks to have adequate capital. One type is a rule setting the maximum leverage ratio for banks, the inverse of the ratio of the bank's capital to its total

assets or liabilities. Another is a rule setting risk-weighted capital adequacy requirement, a ratio of capital to the value of assets where assets are weighted according to their risk.

In the following paragraphs I outline the basic elements of risk-adjusted capital adequacy, for it has been at the centre of international regulatory norms since the 1980s.

Study Note 1.1

As you read the following paragraphs, please make certain that you fully understand the elements of risk-adjusted capital adequacy. The concept is central to modern methods of bank regulation and you will study it in more detail in Unit 2, where I expect you to begin with a good understanding of its elements.

Risk-adjusted capital-adequacy regulations set minimum levels for the ratio of a bank's capital to its assets, after taking account of the riskiness of those assets. Let us assume the bank is required to have capital equal to 8 per cent of its risk-weighted assets. Consider a class of assets that is judged to be risk-less; their risk weight is zero, therefore they do not count in the total of risk-weighted assets and the bank is not required to have any capital against those assets. Assets that are considered to be most risky have a risk weight of 1.0, so that 100 per cent of their value is included in the total of risk-weighted assets, and in our example the bank must have US$8 of capital for every US$100 of such risky assets. Assets with other degrees of risk have weights between 0 and 1.0 in calculating the risk-adjusted value of assets against which the bank is required to have capital equal to 8 per cent.

Risk-adjusted capital requirements have been recognised as central to regulators' approach to credit risk since 1988 when the Basel Accord, known as Basel I, was published. The way that Basel I dealt with risk-adjusted capital requirements has been superseded by more complex rules (after research, debate, and contestation by banks and governments – which continue), but the general principles and difficulties are present in all forms of risk adjusted capital requirements. Let us look at:

- two general purposes of risk-adjusted capital requirements
- two general difficulties of using them.

The general purposes

Risk-adjusted capital requirements address banks' credit risks, but the way they address them is not along one path alone. I think it is important for you to note that these capital requirements achieve two purposes.

One is to discourage banks from undertaking large amounts of credit risk. For any given amount of capital invested in the bank, the amount of loans they have outstanding will be lower when the composition of their loans is more risky, for the more risky loans require higher amounts of capital so the ratio of loans to capital they can hold will be lower. (Looking beyond the

simple model of a basic bank, the same considerations hold for banks' investments in other assets as well as loans.)

The second purpose is to increase the probability that if losses do occur as a result of credit risk, the bank has enough capital to absorb the loss. The important idea here is that if a loss does occur, the first stakeholders to bear the loss are the owners of the bank – the owners who have invested in the bank's capital. Risk-adjusted capital requirements help to ensure there is enough invested by the owners to cover potential losses from credit risk.

Their difficulties

There are many difficulties in designing risk-adjusted capital adequacy rules. Here I focus on the two general difficulties that lie at the heart of most problems.

Capital adequacy rules are expressed as a ratio: the denominator is the sum of assets multiplied by their risk weights; the numerator is the bank's capital.

One general difficulty concerns the denominator, for there are different ways to measure the risk of assets and calculate risk weights. Each has merits and weaknesses and (going beyond the simple model of a basic bank) one method is likely to be considered appropriate for one type of bank while another might be appropriate for another type. How can regulators determine the method?

The second general difficulty concerns the numerator. What types of financial investment in the bank should be counted as elements of its capital? In the simple model of a basic bank the owners' stake is shown as equity, but in reality banks generate capital by issuing various types of equity and equity-like securities and accumulating various reserves that might be included in the measure of capital. Which of these resources should be eligible for counting as capital in the numerator of the capital-adequacy ratio?

Because of the difficulty of agreeing satisfactory methods for measuring risk (the assets weights to be used in the denominator), risk-adjusted capital-adequacy requirements are complemented by leverage requirements that set a maximum leverage ratio for the bank. That can be thought of as (the inverse of) a non-risk-adjusted capital-adequacy ratio, for it sets a minimum level for the bank's capital as a ratio of its total assets.

1.4.3 Two techniques compared

In the preceding sections I have outlined two of the main types of techniques in modern prudential regulation:

- required minimum liquidity ratios, and
- risk-weighted capital-adequacy ratios (plus maximum leverage ratios).

To consolidate your understanding of them, I would like you to try to identify an important difference between them in terms of how they affect the bank's balance sheet.

Review Question 1.2

Please spend a minute answering the question:

- What is the difference between the effects on a bank's balance sheet of required minimum liquidity ratios and risk-adjusted capital-adequacy ratios?

Here is my answer. I think an important difference is this.

- Minimum liquidity ratios operate directly on the asset side of the balance sheet, for the numerator in the ratio is liquid assets, including cash owned by the bank.
- Risk-adjusted capital ratios (and leverage ratios) operate directly on the liability side of the balance sheet, for the numerator in the ratio is the bank's capital, which is a liability of the bank (an asset to the owners of the capital).

Understanding that simple difference will enable you to study more easily the complex regulatory issues that are covered in this module.

So far, our template for examining issues in regulation has been a model of a basic retail bank. In Section 1.6 you will begin to study the more complex forms of bank that have been prominent in modern discussions of regulation, particularly since 2008. Some proponents of reform have made an important argument that, instead of complexity, retail banking should be similar to our basic bank model.

1.5 What is the Purpose of Prudential Regulation?

The regulation issues we have considered in the context of the model of a basic bank enable us to think about the purpose of prudential regulation. 'What is the purpose of prudential regulation?' is an important question, for unless we know its purpose it is impossible to judge whether one regulatory policy is better than another – whether one proposed reform is better than another.

Review Question 1.3

Please take a minute to try to give your own answer to the question:

- What is the purpose of prudential regulation?

There is not one valid answer alone. Different answers would be reasonable, so what is yours?

Maybe your answer would say the purpose is to eliminate risk. Or to prevent a collapse of the international banking system. Or to protect each bank's depositors. Or perhaps you gave a different answer. Some answers like those are good, but some, such as 'to eliminate risk', need to be worded more carefully.

I don't think we can give an answer in one sentence. We can identify answers to the question by saying there are two overarching aims of regulation and then identifying some specific aims within each.

1.5.1 Overarching Aim 1: to influence the amount of risk in banking

Note, that does not mean that the purpose is to eliminate risk, for, as I have already written, risk is integral to banking. In an ideal market economy, banks would manage their business so that the risk of an individual bank and the risks of the banking system are socially acceptable, transparent and priced in a way that enables all to balance risk and returns rationally when making financial decisions. In reality, those conditions do not exist and banks do at times take excessive risk on their balance sheets. (Recall financial systems' frequent episodes of excessive risk-taking that Reinhart and Rogoff documented, with bankers' and others' decision-making clouded by the belief that 'this time it's different'.) Therefore, regulators do aim to influence the *amount* of risk in banking.

Specific aims

We can look at the specific aims in terms of the types of risk.

Regulators may seek to discourage banks from undertaking excessive liquidity risk, using a minimum liquid asset ratio as the regulatory instrument. They do discourage banks from undertaking excessive credit risk, using capital-adequacy requirements and other instruments for that purpose.

We can also look at specific aims in terms of the size of banking unit that is the subject of regulators' concern.

Traditionally, bank regulators are seen as aiming to influence the amount of risk undertaken by each individual bank. In most countries the task of regulators is institutionally linked to the task of regular ('day-to-day') supervision of banks, and the supervisors' role is to oversee each individual bank within their remit. Thus, the regulators' aim of influencing banking risk can validly be seen as a bank-by-bank aim.

But regulators are also concerned about risk affecting the banking system as a whole. The objective is to prevent the collapse of the entire banking system. Indeed, regulatory influence over 'systemic risk' is the driving force behind the large number of person hours that have been devoted to regulatory reform since the Global Financial Crisis, for at some time in that crisis there was a real and justified fear that the banking system as a whole could collapse. Objectives for controlling systemic risk have led to the creation of special Financial Stability units with responsibility for wider financial system stability. Concern for systemic stability in respect of banks has led to proposals for special regulatory measures to be imposed on global banks that are known as 'Systemically Important Financial Institutions' because of their size, complexity and network links.

1.5.2 Overarching Aim 2: to regulate who bears the burden of risk

I think that when people outside of finance, leading lives with another focus, talk about bank regulation they usually assume its purpose is to control banks' risk (or even eliminate it). However, when I reflect on the measures that regulators take, it becomes clear that they have another objective, too. They seek to regulate *who bears the cost of losses* that can result from banks' risk.

Let us focus on risk-adjusted capital-adequacy ratios. Whose burden of potential bank losses is increased relatively when regulators increase the minimum ratio? The owners of the bank's capital, in the simplest case, means the owners of its common equity. The other owners of the bank's liabilities, in the case of a basic bank, are the owners of debt issued by the bank, and deposit owners. By increasing the ratio of capital to risk-adjusted assets (and hence to other liabilities), the regulators are ensuring that shareholders bear a greater proportion of any bank losses. Owners of the bank's debt, and depositors, only suffer a default if the available capital is inadequate to absorb the losses.

For that reason, it can be said that risk-adjusted capital-adequacy ratio requirements (and maximum leverage rules) are designed to ensure there is enough capital to provide a 'cushion' that shifts the burden of potential losses partly towards shareholders, away from holders of the bank's debt, and away from depositors.

Looking at risk-adjusted capital adequacy that way throws the spotlight on depositors. The theory of regulation emphasises the goal of protecting depositors from loss (at least, owners of small retail deposits rather than deposits made by large organisations and financial institutions). I shall ask you to consider the reasons below, but at this point I would like to consider whether shifting the burden of potential losses is, in fact, best seen as a reduction of the risk faced by depositors.

If we look at what is occurring at another level than the balance sheet, we find that depositors (small retail depositors) are not usually at risk. Peeling one layer from the onion, we find that in modern banking systems the state stands behind the depositors. Implicitly or explicitly, national states have become guarantors of the safety of retail depositors' safety. In many cases that

involves an explicit deposit guarantee scheme run by a public body, which insures the value of each customer's deposits up to a pre-announced limit. In countries that lack such a scheme the state is nonetheless seen as the implicit guarantor of bank deposits. Ultimately, as we have seen since 2007, in many instances the state steps in, protecting uninsured deposits by injecting capital into insolvent banks.

In view of the state's role as explicit or implicit guarantor, I believe it is reasonable to think that one objective of regulation is to shift the burden of losses away from the state and the deposit insurance bodies established by states, as shown in the following example.

Box 1.1 Moral Hazard

Here is one important historical example that shows the real operation of the link between regulation and protecting the state from guarantor's losses. One of the first actions of President Franklin D Roosevelt, in an attempt to lead the United States out of the Great Depression that followed the 1929 Wall Street crash and the widespread bank failures of 1931, 1932 and 1933, was to insure the deposits of a high proportion of banks. The 1933 Banking Act, which became law quickly after Roosevelt took office, is well known, under the name the Glass-Steagall Act, for one of its boldest features: the prohibition on banks conducting both normal commercial banking (deposit taking and commercial lending) and investment banking.

But equally, or more important was the Act's establishment of the Federal Deposit Insurance Corporation (FDIC) to insure the deposits of eligible commercial banks. It was a pro-recovery initiative to rebuild depositors' confidence in the banks, and its success in that respect became evident as early as 1934.

The FDIC's initial funding was injected by the US Treasury and the Federal Reserve. In order to protect the scheme's resources from uncontrolled demands for FDIC pay-outs, the FDIC was given extensive powers to regulate and supervise the banks that it covered. Interestingly, for the issues studied here, one of its first regulatory initiatives, taken in 1934, was to set capital-adequacy rules (not risk-adjusted capital adequacy) for the banks it covered.

As a general principle any insurance scheme has to be accompanied by the insurer setting conditions or, in other words, regulating the behaviour of the insured. Absent that regulation, the existence of insurance may create 'moral hazard'. That means insurance creates an incentive for the insured to undertake more risky behaviour than otherwise (in the case of deposit insurance, moral hazard means that insurance creates an incentive for the bank to behave in ways that create greater risks for depositors).

1.6 From the Simple Basic Model toward Actual, Complex Banks

In this section and the next, I introduce some extensions to the basic model of a bank. They are extensions that bring the model a bit closer to the actual banks that exist today. They will enable you to understand better the current and recent issues complicating actual regulatory reforms, issues that you will study in Unit 2, so I advise you to study this section carefully.

We shall discuss the necessary extensions by comparing the balance sheet of the basic bank model with a constructed example of the actual balance sheet of a US bank.

Please look again at the basic bank balance sheet in Section 1.4. There the basic bank's liabilities comprise three types:

- capital
- deposits
- the bank's debt.

Its assets are equally simple, comprising 'Cash and Other Liquid Assets', and 'Loans'.

Now consider the following example of the balance sheet for a hypothetical but realistic bank in the United States.

Table 1.2 More Realistic Bank Balance Sheet

	Currency unit million		Currency unit million
ASSETS		***LIABILITIES***	
Cash and other liquid assets	10	Checkable Deposits	90
Securities		***Nontransaction deposits***	
Central government and agencies	70	Small denomination time deposits + savings deposits	300
Local government and other securities	20	Large denomination time deposits (CDs)	10
Loans		***Short-term borrowings***	**400**
Commercial and industrial	150	Debt	100
Real estate	360	Equity	100
Interbank	270		
Other	120		
Other Assets			
Total assets	**1000**	**Total liabilities**	**1000**

Souirce: adapted from Miskin and Eakins (2006) Chapter 17, Table 1

What are the main differences?

Clearly, the realistic balance sheet is more complex. That is mainly due to two differences:

1. Some categories in the basic balance sheet are, in reality, one – subdivided and re-located. For example, the liability 'Deposits' is subdivided into 'Checkable' which are usually non-interest-bearing

liabilities' (effectively current account deposits) and 'Nontransaction deposits', and the last named is further subdivided into different types.

2. The actual business of the bank in the realistic example is more complex than in the basic model.

We need to focus on the second difference, for we are interested in the type of banking operations that are not captured by the basic model. I am going to concentrate on one instance, for it illustrates a feature of modern banking that is central to understanding liquidity risk and the challenge it poses for regulation. On the liabilities side, please look at the category 'Short-term borrowings'. What banking activity does it represent?

'Short-term borrowings' represent funds obtained by borrowing from the central bank (say the Federal Reserve System in the US or the European Central bank for the Euro area) or other banks. This is because in almost any country banks hold accounts at their central banks, and thereby cash can be borrowed and lent for short periods between commercial banks and the central bank and between commercial banks themselves. One technique for borrowing is to enter into a 'repo' agreement, under which the bank sells securities for deposits at the central bank with an agreement to buy them back at a pre-arranged price (reflecting the interest charged for the credit). Thus, 'Short-term borrowings' represents cash that the bank has borrowed for a short period using a *repo* or other arrangement.

The existence of a large and highly developed market for such very short-term deposits means that liquidity risk is different from the liquidity risk discussed in the context of the basic bank model where it was assumed that banks' cash and other liquid assets responded passively to net changes in deposits resulting from customers' choices. Recall that the basic bank faces the risk that its holding of cash and other liquid assets might be inadequate to meet depositors' net withdrawals. An actual bank, able to borrow cash short term, does not face the same constraint, for it can expect to be able to meet its liquidity needs by daily adjusting the amount of its net borrowing.

Nonetheless, banks' use of such wholesale credit markets does not eliminate liquidity risk; instead, it changes its nature. The risk is that potential lenders will unexpectedly cease to be willing to lend to a particular bank, or to banks in general. Such problems surfaced at times in 2007 and 2008. In the worst period, when prominent bank failures made each bank uncertain about the solvency of any bank, the wholesale market for interbank loans effectively shut down (which increased the likelihood that banks would quickly become insolvent because the liquidity shortage prevented normal business).

The dependence of banks on wholesale money markets for short-term funding, and the risk of markets changing, illustrates an important feature of modern banking. The operations of important banks and large numbers of other banks are wholly linked to the operations of credit markets and also to markets for a wide range of financial securities. Your study of Unit 3 and other units will examine the ways in which those interactions between banks and markets pose challenges for regulators. Also, the Global Financial Crisis

has dramatically highlighted how interbank lending and lending from other intermediaries has proved a dangerously efficient mechanism of transmission of the effects of the crisis across several intermediaries (or, in other words, a method of contagion).

But even the realistic example of a bank balance sheet does not capture all the ways in which today's banks are interlinked with financial markets and how the strengths of banks and of financial markets are interdependent. The main reason is that it is a balance sheet of a commercial bank, whereas a notable feature of banking in the late 20th century and early twenty-first has been the growth of banks that combine commercial banking with investment banking.

In the United States that development has been linked with the erosion and repeal of the provisions of the 1933 Banking Act, the Glass-Steagall Act, which required separation of the two types of banking.

Market deals are at the heart of investment banks, for they buy and sell financial instruments both on behalf of clients and, crucially, in 'proprietary trading' for profit making on their own account. Banks that combine commercial banking with investment banking, sometimes known as universal banks, bring market operations into the heart of banking and pose special challenges to bank regulation.

Exercise 1.1

Please pause for a minute to consider a key difference between a basic bank model of a commercial bank and an investment bank. A basic commercial bank's main assets are assets that it plans to hold until maturity – for example, a loan to a company that it plans to keep on its books until the due date for repayment. An investment bank's assets include marketable assets that it owns in order to be able to trade them in continuously adjusted portfolios.

(In accounting terms, the latter are held in the bank's 'trading book'. If a bank holds marketable securities with the intention of holding them until they mature, they are held in its 'banking book'. As you will see in Unit 2, one difficulty regulators have faced is determining the appropriate risk-adjusted capital adequacy for those different types of 'books'.)

1.7 The Global Financial Crisis and What Regulators Are Left to Do

The concepts and issues you have studied in Sections 1.1 through 1.6 provide the basis for understanding the matters that confronted regulators in the immediate wake of Global Financial Crisis, which exposed a great failure of regulation in the US, the UK, and other countries.

In the period leading up to late 2007, real estate prices declined in the US. Prime and subprime borrowers, that is borrowers with high credit scoring and low estimated probability of default and borrowers with low credit scoring and high estimated probability of default respectively, increasingly

defaulted, which put downward pressure on the values of both securitised mortgage products and mortgages remaining on bank balance sheets.

A fire sale of any asset backed by subprime mortgages started, and it generated a freeze of repo operations based on those bonds. This resulted in the drying up of interbank financing with large losses and the failure and closure of many banks, while problems of market liquidity and capital losses drastically reduced lending and liquidity creation by banks and led to the intervention of both central banks and governments.

Initial responses to the crisis included various forms of government intervention from the purchase of troubled assets, to increased state guarantees to capital injections into financial institutions to final full nationalisation. Estimates vary, but some put the net outlays of the US Treasury and Federal Reserve at US$3.3 trillion and the value of the amount of guarantees provided at US$16.9 trillion. This notwithstanding, growth of credit has not stopped and, according to World Bank data, credit to the private sector as a percentage of GDP in 2015 is everywhere above the levels of 2007, with a minor exception for OECD countries.

As a starting point for reform, regulators sought to understand what had gone wrong, and several questions still lay unanswered such as:

1. Is the global economy simply over-financialised?
2. Is financial innovation simply 'evil'?
3. Are banks too big (to function efficiently as well as) to fail?
4. Should banks go back to traditional activities (that basically corresponds to commercial lending) or diversify?
5. Is a competitive banking sector more or less fragile (that is, prone to crises)?
6. Is liquidity 'too much of a good thing'?

Here below are my answers.

1. Before the crisis, the academic and policy consensus was that financial institutions by solving market frictions in the form of information and transaction costs supported long-run growth, mobilising savings, allocating resources, facilitating risk management, and in general easing the exchange of goods and services. Several studies found that the relationship between financial development and growth is non-linear. In particular, Arcand *et al* (2012) found that financial depth – usually measured by credit to private sector to GDP – has a negative effect of output growth in a range between 80% and 100% of GDP.

Table 1.3 Domestic Credit to Private Sector (% of GDP)

	World	Low income	Lower middle income	Upper middle income	High income	OECD members
1960	49	…	9	…	54	53
1970	63	8	13	28	69	68

	World	Low income	Lower middle income	Upper middle income	High income	OECD members
1980	69	15	18	37	77	77
1990*	100	16	26	45	109	108
2000	132	11	28	54	156	152
2007	128	13	38	63	152	150
2008**	122	15	42	63	147	145
2010	123	16	40	79	149	147
2015	130	20	46	114	148	147

* domestic credit matched GDP on world average

** Great Financial Crisis (GFC)

Source: unit author with data from World Development Indicators (2016)

According to Table 1.3, countries above upper middle income (that is with a Gross National Income per capita above US$12,476) were well above that in 2007 when the crisis struck and still are in 2015. Please remember this view when you are studying lender of last resort roles in Unit 5 and bail-in in Unit 6.

2. In principle, innovations like making non-tradable assets actually tradable (say with securitisation and credit derivatives) should improve the efficiency and stability of the financial system by facilitating the transfer of risk to those investors most willing or able to bear it, allowing banks to diversify their portfolio while not disrupting their function of transformation of maturities (that is, borrowing short term while lending long term). Unfortunately, real-life investors before the crisis were not actually 'most willing' to take up a risk that, in the end, they did not know. Please remember this view when you study shadow banking in Unit 3 and the political economy and ethics of banking regulation in Unit 8.
3. Several studies find that scale economies are prevalent for the largest banks. However, part of the potential benefits which accrue to large banks may be from being considered too-big-to-fail (TBTF). For example, if private investors are confident that they will not incur losses if these TBTF banks perform badly, then the cost of capital held by these banks will be lower than their smaller counterparts. As a consequence, the economies of scale observed for large banks may arise in part or in whole from implicit subsidies arising from TBTF status. Very interestingly, Davies and Tracey (2014) use a sample of US and European banks and they increase the cost of bank funding upwards to a level that would prevail if these banks no longer enjoyed TBTF status. These authors find that large bank scale economies disappear. Please remember this view when you study 'too-big-to-fail' in Unit 6.
4. Empirical research supports the claim that diversification – whether going international or in less traditional financial activities as associated with increased risk and lower (long-term) profit. This is especially true if non-traditional financial activities are pure fee-based ones, say

securities brokerage or insurance selling, rather than asset-based activities like securitisation or trading on the banks' own assets. Demirgüç-Kunt and Huizinga (2010) examine the effects of diversification and funding strategies on bank risks and returns for a sample of banks from 101 countries covering the period 1999–2007. They find evidence that banks with high proportions of non-interest income, or those that rely on non-deposit funding, tend to be very risky. Please remember this view when you study Basel agreements in Unit 2.

5. A reasonable answer seems to be (like most in economics): 'it depends'. In the case of competition and resilience (or lack thereof) the relationship may be non-linear as heightened competition may push for more efficient operations by the bank in selecting borrowers and managing loans, although it may also reduce the interest payments from performing loans, as the best potential borrowers are priced out by competing banks. The relationship between competition and fragility/resilience depends on which effect prevails.
6. During the Global Financial Crisis, investors withdrew funds from collective pools of cash by declining to roll over loans and other contractual agreements. These actions forced many banks to sell securities to meet the increased demand for liquidity. As a consequence, asset prices rapidly declined due to excess supply, amplifying the initial liquidity shock. On the other hand, liquidity may not always be 'too much of a good thing'. Berger and Bouwman (2013) analyse financial crises over the last quarter century and find that high liquidity creation (relative to trend) helps predict future crises after controlling for other factors. This is presumably because such excess liquidity creation generates asset price bubbles that eventually burst and cause financial crises. Please remember this two-sided view when you study Basel agreements in Unit 2.

Reading 1.1

Please study Chapter 1 of Berger *et al* (2014), the article by Berger *et al*. As you do so, focus on Section 1.3 and see if you agree with my answers.

Allen Berger, Philip Molyneux and John Wilson (2014) The Oxford Handbook of Banking, Chapter 1 'Banking in a Post-Crisis World'

1.8 Conclusion

In this unit you have studied broad issues that are central to bank regulation, as well as locating them in the context of historical and recent developments in banking. The developments you have studied are from the United States and the United Kingdom, two jurisdictions that have had a central position in modern banking and regulation. But regulation is now recognised as an international matter, and in the next unit you will study recent international agreements and controversies over bank regulation. Those are the issues that have been at the heart of the accords known as Basel I, II and III, which will be detailed further in Unit 2 as well as other issues, such as systemic risk which will be one of the major themes of Unit 4.

Optional Reading 1.1

If you feel like you need a 'wrap up' about the Global Financial Crisis (GFC) and what is left in the hands of regulators I recommend the following:

> John Kay (2015) Chapter 10 'Reform'. In: *Other People's Money*, Profile Books, London, UK.

The concluding periods are particularly thought-provoking:

> Personal responsibility is vital to reform. But this should not lead anyone to think that the only, or principal, issue is one of picking the rotten apples from the barrel. […] In finance, as in every walk of life, there are people with high ethical standards and people with none; people who stand up for what they believe is right and people who find it easier, or more rewarding, to conform to prevailing norms. […] In talking to the financial community, I have been struck by the number of people who want to do a better job, but who find themselves frustrated by the system within with they work, the values and business imperatives or their employers, the unrealistic and inappropriate demands of their clients, and the regulatory framework imposed on them. Only by addressing *all these issues together* can we re-establish a financial system designed for the needs of the real economy (Kay, 2015: p. 296).

Maybe, when you finish this module, you will wish to read the whole book.

However, as this is an optional reading, its contents will not be tested, and you are *not* required to study it if time and availability forbid.

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