

# **Bank Financial Management**

## **Unit 1 Banking Innovations and Risk**

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## Unit Overview

Unit 1 introduces you to some basic elements of bank financial management. Its central thesis is that bank financial management is best seen as a dynamic task, creating and responding to powerful innovations in banking and in the markets with which banks work.

The unit focuses on the major banking changes, affecting large banks especially in the United States, in the decades leading to the financial crisis of 2007–09.

Central to those changes was the development of techniques of *credit risk transfer*. This unit is structured to enable you to learn about the dynamic processes that led to banks' use of 21st century credit risk transfer.

In studying the unit, please ensure that you leave enough time to read and consider carefully the major article on credit risk transfer that we introduce at the end, in Section 1.7.

## Learning outcomes

When you have completed your study of this unit and its readings, you will be able to:

- discuss the nature of financial management in a simple 'basic retail bank'
- outline the main changes in the United States banking environment from 1970
- analyse the main mechanisms of credit risk transfer developed by banks between 1970 and 2007
- discuss the implications of credit risk transfer for banks' financial management
- relate your understanding of those matters to examples and data.



## Reading for Unit 1

Timothy Koch and Scott MacDonald (2015) *Bank Management*, 8<sup>th</sup> Edition. Boston, MA USA: Cengage Learning: Chapter 1 'Banking and the Financial Services Industry'; if you are unfamiliar with banking regulation, you should also read Chapter 2 'Government Policies and Regulations'.

William Poole (2008) 'Financial Innovation: Engine of Growth or Source of Instability?', speech given at University of Illinois, Springfield, March.

Darrell Duffie (2008) 'Innovations in credit risk transfer: implications for financial stability', BIS Working Papers, No 255.

## 1.1 Introduction

As was noted in the module introduction, your study of banking institutions in this module will focus mainly on American experience. That is not because banking in the United States is more admirable than other countries' banks. Nor does the United States have the world's largest individual banks. But banking in the United States has many complexities which result from the size of the system, the interaction between banks and highly developed credit markets, the complex legal and regulatory structure of American banking and the number of banking innovations that have originated there.

In the late 20th century, as economies became involved in globalisation, countries with rather different banking systems have increasingly adopted changes making them more like American banks. Those are the reasons that make it worthwhile to focus on the American system. And one big reason is that the financial crisis that started in 2007 and affected economies around the world afterwards originated in the United States, so the study of American principles of bank financial management might help us to identify the mistakes to be avoided.



### Reading 1.1

For a good overview of banking operation and some of the changes brought about by the crisis of 2007–09, you should read Chapter 1 of Koch and MacDonald (2015), which very effectively introduces the main issues discussed in this unit.

You may also read the second chapter, but this might cover ground you are already familiar with, so it is optional. You might want to skim-read or glance at the topics covered to give you an idea of how useful this will be – and, of course, read it carefully if this account of banking is new to you.

Timothy Koch and Scott MacDonald (2015) *Bank Management* Chapter 1 'Banking and the Financial Services Industry' and (optional) Chapter 2 'Government Policies and Regulation'.

## 1.2 Bank Management and Bank Financial Management

To be the Chief Executive Officer of a large, or even a small bank carries a large remit. Although banking is synonymous with finance, can the whole job be reduced to bank financial management?

Probably not. A good bank requires good management in areas that are not directly financial. Human resource management is necessary to ensure the bank's teams work well and fit well with the bank's objectives. The quality of management in information technology and systems can make or break a bank. And the management of marketing is vital for attracting savers and borrowers. The management responsibility in those fields is relatively clear, but what is involved in a bank's financial management?



### Review Question 1.1

Please pause a minute and consider that question:

- What is involved in a bank's financial management?

Bank financial management is the management of a bank's financial assets and liabilities (the main items on its balance sheet) so as to achieve a desired balance of net returns and risk. Writings on the subject focus on the risk-management side, and specialists within the bank – those in the asset-liability management office – are usually located within the risk management group.

In the following sections of this unit we introduce you to the changes that have affected the tasks of bank financial management.

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### 1.3 'The Good Old Days' – A Simple Balance Sheet View of Banking

This unit is being written after the outbreak of one of the worst financial crises the world has seen. It is a crisis that is continuing without anyone being able to see when it will end; and when the financial system does begin to function smoothly again, the effects of the shock will continue to be felt for many years. Financial institutions and financial markets of all types – including several types of banks, insurance firms, hedge funds, investment funds, inter-bank money markets, derivatives markets, stock exchanges and foreign exchange markets – have been swept up as the crisis has unfolded, but banks have been at its centre from the start.

By throwing banks into the spotlight the financial crisis has given us all a clear insight into how the nature of banks – particularly but certainly not exclusively – banks in the United States and United Kingdom, has changed dramatically since the 1990s. The new business model of banking was known by specialists before the crisis – although the risks inherent in it were not explicitly recognised by many – but the wide news coverage and discussion of the crisis has given every saver and borrower a window on how banks have been operating.

The picture that emerges is that important banks, driven to maximise short-term profits, have concentrated on forms of lending that are highly risky – sub-prime mortgages being the most well-known example – while believing that the risks could be sold on to others instead of being carried by the originating bank itself. In the process they created assets and liabilities which were themselves highly risky because few understood how their value was calculated, and those increased the risks being borne across the banking system. At the same time, to finance their assets growth, banks borrowed funds from wholesale money markets without calculating the risk that such markets might close down, as, indeed, they effectively did, late in 2008. Above all, the picture shows that individual banks and the banking system as a whole had become extremely complex. So complex, in fact, that senior bankers and bank regulators did not understand the risks.

The clear light that has now shone into the workings of banks at the start of the 21st century is both valuable and problematic for studying the subject of this module, *Bank Financial Management*.

- It is valuable because it enables you to identify more easily the fundamental tasks of bank financial management.
- And it is problematic because, now that the great flaws in the practices of the banks at the centre of the crisis have become so evident, banks' financial management and the regulations governing it will change in ways that are not yet foreseen.

Because bank financial management practices, which until recently had been regarded as 'cutting edge', have meant that banks have become highly complex, it is a good idea to start by analysing financial management in a simpler type of bank. Let's call it a Basic Retail Bank.

The Basic Retail Bank is not a purely imaginary construct, for it resembles the essence of the way that nearly all American and British commercial banks – 'high street banks' – operated in the 1950s and until the 1980s. Many small banks did not move far from those principles in the following years, although the big commercial banks did.

The Basic Retail Bank represents a bank as being a place where savers deposit cash with a right to withdraw it or transfer it at short notice, and the bank lends those resources to other customers. The bank is able to do that because there is a low probability that depositors will choose to withdraw money (or transfer it to their own or others' accounts in other banks) simultaneously. Nonetheless, the bank keeps a fraction of the deposits in reserve as cash (or highly liquid assets similar to cash) in order to be able to meet withdrawals that it estimates depositors might make. As a result, this basic model of banking is known as *fractional reserve banking*, and the same principle of 'fractional reserves' applies even in more complex banks.

The evolution of fractional reserve banking in ancient times is well described in the following recent book by one of the leading academic theorists of banking:

Historically banks started as money changers [...] 'banco' or 'banca', the Italian word for a bank, refers to the bench used by money changers to display their currencies. Interestingly, this money changing activity naturally led early bankers to also provide deposit facilities to merchants using the vaults and safes already in place for storing their precious coins [...]. [They] very soon realized that the specie and gold [cash] deposited in their vaults could be profitably reinvested in other commercial and industrial activities. This was the beginning of the fractional reserve system in which a fraction of demandable deposits are used to finance long-term illiquid loans [...]. As long as the bank keeps enough reserves to cover the withdrawals of the depositors who actually need their money, which is much less than the total amount of the deposits, the system can operate efficiently.

Source: Rochet (2008)

The character of the Basic Retail Bank, using fractional reserve banking, is best understood by considering the simple structure of its balance sheet:

**Table 1.1 Balance Sheet of Basic Retail Bank (\$)**

Assets		Liabilities	
Reserves (cash)	10	Deposits (owned by depositors)	95
Loans (to enterprises)		Capital (owned by shareholders)	5
			90
<b>Total Assets</b>	<b>100</b>	<b>Total Liabilities</b>	<b>100</b>

To flesh out this example, the bank's owners hold shares representing \$5 injected as capital. They have attracted \$95 in deposits, which can be withdrawn at any time. They choose to hold only ten percent of the bank's total assets in the form of cash reserves (\$10) and therefore lend \$90 of depositors' money to enterprises.

That model gives a good general picture of the essence of commercial banks' balance sheets in the mid-20th century, although it is too simple to describe in detail how banks used to work then. Let us note the main additional features of banks' old-style balance sheets; they get us closer to reality without altering the essence of the Basic Retail Bank model.

On the asset side, loans themselves were of several types, including both overdrafts and term loans. And commercial banks' assets comprised not only loans, for commercial banks also invested in government debt, such as Treasury Bills. (Investment banks held a wider range of assets.)

Banks' liabilities included deposits of various types including both checking (current) accounts and savings (deposit) accounts. Savings accounts were interest bearing while in the United States and elsewhere checking accounts were not.

The Basic Retail Bank model is still less accurate as the description of a modern bank at the start of the 21st century, even a relatively simple small modern bank and certainly not the great banks at the heart of the recent crisis. But there are three things to note about our model of a Basic Retail Bank.

- First, it is still widely used in elementary economics courses and textbooks for teaching the essence of banking, and its simplicity makes it useful for some advanced theoretical work on banking.
- Even today many small banks adhere to similar principles.
- And the recent crisis, generated by banks that had moved a long way from basic retail banking, has led to widespread calls for banks to revert to being the type of simple institution that we used to have in 'the good old days', which had some similarities to that model.

### 1.3.1 Bank financial management before 1970

A bank's financial management was quite simple in 'the good old days' when the banks were not much more complicated than the Basic Retail

Bank. It was greatly eased by the fact that regulation and other factors meant that banks were not significantly in competition with each other over interest rates paid or over their attractiveness to equity investors.

At its simplest, bank financial management is concerned with the net interest paid on liabilities and obtained on assets, and with the risk on assets and liabilities. In the 1950s and 1960s *interest rates* were administered in line with rates set by the government or central bank, leaving little scope for active management. On the liabilities side, banks passively accepted deposits instead of paying interest rates, which were set to compete with other banks for attracting deposits. On the asset side, the division of assets between interest bearing loans and non-interest bearing reserves (cash reserves) or low interest reserves (liquid asset reserves) was regulated by the minimum reserve ratio set by the authorities.

What about *risk management*? The two types of risk that dominated bank managers' thinking, and sometimes gave some of them sleepless nights, were *credit risk* and *liquidity risk*.

*Credit risk* is the risk that borrowers might default on their loans. The most important task of bank management was judging which loan applicants were good credit risks and monitoring their situation while the loan is current. The historical picture is that old-fashioned bank managers knew their customers, could judge their probity and competence, and kept in touch with their business circumstances. Here is an example quoted by the BBC:

Ronald Ibbotson, who joined the (now defunct) Martins Bank group in 1949 and managed the Barclays branch in Amesbury, Wiltshire, between 1972 and 1986 [recalls that] the key for him was a presence in a local community that enabled informed financial decisions to be made about people who wanted credit [...] 'I knew them, I knew what they were capable of repaying. I used to go and visit their businesses and see what they did, what they made and how they seemed. Today risk management is done by computers'.

Source: BBC News Magazine (2008)

*Liquidity risk* in the Basic Retail Bank is essentially the risk of a bank run. A bank run occurs when all or a large proportion of depositors attempt to withdraw their deposits simultaneously, more than exhausting the bank's cash reserves. General confidence-building measures (such as having imposingly solid bank buildings) might be used. Other than that, the main responsibility was to ensure that total lending was not expanded so far that reserves fell below the reserve ratio that provided an adequate cushion of liquidity. Ultimately, the key to reducing the risk of runs was the management of credit risk, because a bank run could be triggered by depositors' fear (whether justified or not) that the bank's assets are or are soon to be reduced by losses on bad loans. Again, the basic weapon of bank financial management was the 'old fashioned bank manager', with his local knowledge and good judgement.

Credit risk and liquidity risk remain fundamental problems for banks today, but because large banks' operations had become much more complex by 2007 and their balance sheets less simple or transparent, their financial management has to take account of different types of risk. They also have had a wider range of instruments and techniques for managing risk.

Most of this module focuses on how banks' financial management can deal with the types of risk that banks have faced since they moved away from the old-fashioned business model described by the Basic Retail Bank.

### 1.3.2 Bank financial management in crisis

The crisis that started in 2007 shows that those new risk management instruments and techniques alone were not enough to prevent the collapse of countries' banking systems. Some commentators argue that banking should revert to the simpler days when high street banks, commercial banks, were like the Basic Retail Bank. Here is a recent example of a look at old-fashioned banking in a tone that implies that it would be wise to return to the 'good old days'. It was published by a respected British economics commentator in a UK newspaper; his term 'clearing banks' is nowadays often replaced by 'high street banks' or 'commercial banks':

Recently I received a letter from a lawyer friend who retired from the City [the 'City' area of London, the financial centre] some years ago. Entitled 'Thoughts of an Old Man on the UK Banking System', it traced the history of what we used to call 'joint stock banks' [...] known to later generations as the clearing banks, who met the need [of bank customers] by, in effect, guaranteeing 'no imagination' and 'no bright ideas', just 'a safe haven for your money'.

When my friend worked in the City, and when I first came into financial journalism, clearing banks provided current account facilities; they did not make long-term loans, and certainly did not lend against mortgages, which were the preserve of the building societies and institutions such as life assurance companies. These latter could look at their own books, see they did not need the money back until their own policies matured in (say) 20 years' time, and thus could safely make loans maturing in 20 years' time. Those seeking capital appreciation could use the stockmarket.

I have summarised my friend's analysis, which he modestly calls 'oversimplified – yet I cannot help wondering if it did not have some advantages', adding 'of course, there were risks, but they were identifiable and more or less measurable'.

Source: Keegan (2009)

Should we return to the 'good old days'? Even if you think that would be a good idea, the changes that banking has seen since the 1970s are so great that they would be difficult to reverse. In the next sections, we will examine those changes and what has driven them.

Before starting that analysis, let us finish this look back at old-fashioned banking by noting that many banks around the world continue to operate rather like the Basic Retail Bank, including in the United States and United



Kingdom, where large banks have been at the centre of recent financial turmoil. Here is an example of one British bank operating in very traditional ways; its balance sheet can easily be compared to the balance sheet we set out for a Basic Retail Bank (except that, being a mutual, it does not have shareholder capital). We are including it as some light reading. Please do not spend much time on it or include reference to it in any of your assignments or exam answers.

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**Box 1.1     Airdrie Savings Bank: Boring, stolid, small and safe**

**'How one bank stuck to its last and prospered'**

AMID the hallucinogenic chaos of world finance today, it would be hard to find a duller bank than Airdrie, [a] currently thriving, independent savings bank in Britain. Customers love it. 'We had an inflow of £8.5m in deposits in October', says Jim Lindsay, the bank's general manager.

That may not sound much, but it represents a 7.4% increase in deposits. Airdrie Savings Bank is tiny. It has seven branches, 60,000 customers and 104 employees to serve the county of Lanarkshire, east of Glasgow. It was born out of the savings-bank movement pioneered in 19th-century Scotland by the Rev Henry Duncan, concerned that his poor parishioners had nowhere to save money earned in good times to draw on in tough times later. Mr Duncan's success rapidly spawned copies throughout Britain and, eventually, in America. In 1985 the little bank sturdily resisted heavy pressure from the Bank of England and the Treasury to join the amalgamation of most other such banks into the publicly quoted Trustee Savings Bank (TSB), which was later privatised and bought by Lloyds in 1995.

The headquarters, an elegant but austere Art Deco building across the road from Airdrie's police headquarters, speaks of security. Inside, tellers under the portraits of bewhiskered Victorian forebears have modern computers but do old-fashioned things, such as weighing bags of coins; they do not sell customers insurance or mortgages.

Ten self-selecting local businessmen and professionals act as trustees, forming the board which Mr Lindsay reports to but does not sit on. They stick stodgily to a rule that only a third of customers' deposits (which totalled £115m in 2007) should be advanced in loans, a third kept on deposit with other British banks for liquidity purposes and a third invested in government bonds. Profits, limited to between £500,000 and £750,000 a year, are made only to bolster the bank's reserves, £14m last year. There are no shareholders: Airdrie Savings Bank's customers own it. The reserves, bonds, and deposits it keeps with other banks are its core capital, which amounts at present to about 30% of its liabilities, says Mr Lindsay. That is more than three times the increased capital demanded of British banks since the recent bail-out. A modest across-the-board bonus is paid to all staff when conditions merit it.

'Risk' seems almost a swear-word at Airdrie. The bank does not issue credit cards, only debit cards. 'We don't have any currency risk', says Mr Lindsay. And he arches his eyebrows at the folly of the Barnsley Building Society, which rushed into a merger with the Yorkshire Building Society last month after discovering that £10m of its assets were locked up in tottering Icelandic banks. Airdrie's bad debts in 2007 were just £53,000, against loans of £33.5m, four-fifths of them to local businesses. 'We'd only be in trouble if the whole British banking system collapsed', says Mr Lindsay. 'But then, everyone would have a lot more to worry about than us'.

*The Economist* (13 November 2008)

## 1.4 The Transformation of Banking – 1970 to 2007

The world of banking began to change in the United States as the 1960s ended. The changes continued in waves and in the first years of this century the pace and complexity of change increased fast. The changes have occurred jointly with the development of modern, active financial management by banks, the active management of assets and liabilities.

### 1.4.1 Overcoming constraints on growth

A useful way to understand those developments is to focus on banks' drive to expand. Not all have had that drive, but large commercial banks in the United States and United Kingdom have seen that as a route to satisfying their shareholders' desire for profit growth, and banks elsewhere have followed. Growth which involves expanding the balance sheet – making more interest-earning loans financed by increased deposits – was not easy for a typical bank of the 1960s, for there were two constraints on it. These can be seen in terms of the simple balance sheet of the basic retail bank, Table 1.

On the *asset* side, the need to maintain a minimum cash reserve ratio (and minimum liquid assets ratio in the UK) meant that with any given level of reserves the amount of loans outstanding was restricted.

On the *liabilities* side, the banks' creditors and bank regulators would have some desired leverage ratio, the ratio of shareholders' capital to total liabilities and assets (a requirement that, under the Basel Accords, was to become increasingly formalised by regulators in later years). That restriction of banks' leverage ratio restricted banks' expansion and the profitability for shareholders.

In order to grow and to generate greater returns for shareholders, banks sought ways to circumvent those two basic constraints, and financial management techniques developed in the process of overcoming them.

Those two basic constraints were not the only ones affecting banks. Here is a summary of other major constraints on banks' ability to increase their business in the 1960s:

- Interest rates payable to depositors were regulated in some countries. In the United States, 'Regulation Q, which existed from 1933 to 1986, prevented banks from paying interest-on-demand (checking) deposits and enabled the Federal Reserve to impose a ceiling on interest paid on savings deposits. In countries where no such legal restrictions existed, interest rates were restricted by the main banks acting, with official approval, as cartels to avoid interest rate competition.
- Geographical boundaries of bank operations were regulated. In the United States banks were prevented from opening branches outside their home state and, in some cases, outside their home-town. In other countries, licensing authorities were able to restrict

geographical expansion. In all countries, restrictions limited the ability of banks to operate branches abroad.

- Regulations and other barriers maintained inflexible boundaries between commercial banks, other banks, and other financial intermediaries (sometimes known as ‘quasi banks’). The most salient example was the separation between commercial banks and investment banks in the United States enforced by the 1933 Glass–Steagall Act until its repeal in 1999. Other countries had similar distinctions, such as the United Kingdom’s separation between commercial banks, merchant banks (which carried out some investment banking functions) and building societies, which were ‘mutuals’ and were almost the only source of residential mortgages. In continental European countries and others, banking was organised differently, with the large banks functioning as *universal banks*, which combined commercial banking, investment banking, and other functions.

Several factors contributed to the changes in banking between 1970 and 2007. One that has often been remarked upon is the development of information technology and the Internet, which was undoubtedly important, especially in the rapid changes that occurred in the period after 1990. But here we put forward a proposition:

- The main factors driving the changes in banks’ financial management were banks’ attempts to overcome the constraints on their growth and profitability, and official policies that changed the constraints.

To illustrate the reasoning behind that proposition, let us set out some examples of banking changes.

#### 1.4.2 Banking changes since the 1960s

The first change that began in the late 1960s in the US and then became widespread was the development of *active liability management*.

Instead of passively accepting deposits, banks developed techniques for actively seeking new deposits and (especially after 1980) competing with each other for them. The growth of deposits was necessary to enable a bank to expand its lending – or, more generally, the size of its balance sheet. The amount of loans held was constrained by an old-fashioned bank’s reserve ratio, and attracting deposits which boosted cash reserves was necessary if loans were to be expanded without violating the ratio.

Under Regulation Q, US banks could not compete by raising interest rates on conventional deposits, so they invented a new type of retail deposit, *money market accounts*, created in 1982, which enabled depositors to receive interest linked to interest rates on money market securities while having instant, checking, access. At the same time, banks made increased use of *certificates of deposit* (which had been invented for US banks in 1961) to attract fixed interest, medium-term savings deposits.

Active liability management was followed by the growth in importance of *active asset management*. An important constraint on banks' balance sheets was the need to maintain a desirable ratio of equity capital to total assets and liabilities. A high level of equity implies that the owners are carrying a high proportion of the bank's risks, which gives depositors and other creditors confidence, but it also means that shareholders do not get the maximum benefits that high leverage would give to profitability. Banks' owners themselves have to balance those advantages and disadvantages in choosing an appropriate ratio of equity to total assets. But with the promulgation of the first Basel Accords in 1988 (Basel 1), regulators required banks to have *Tier 1 capital* (equity capital plus declared reserves and irredeemable preferred stock) equal to a certain percentage, a required capital adequacy ratio, of their risk-weighted assets.

### Basel 1

The general rule under Basel 1 was that banks should have a capital adequacy ratio of at least eight per cent of the risk-weighted total of their assets. If a bank had a capital adequacy ratio of eight per cent, it could not then expand its assets by making more loans with the same risk weights unless it raised more Tier 1 capital by, for example, issuing more shares.

The concept of having required capital measured against the *risk-weighted* total of assets was a powerful stimulus to active asset management. Some loans were classified as being less risky than others; therefore, with a given amount of Tier 1 capital, banks could have a larger amount of such loans outstanding than higher risk loans. For example, under Basel 1 residential mortgage loans were classified as having a risk weight of 0.5, while unsecured loans to businesses had a weight of 1.0. Consequently, with \$40 of Tier 1 capital a bank could support \$1000 of residential mortgages but only \$500 of unsecured loans to businesses.

The required capital adequacy ratio measured against the risk-weighted total of assets gave banks a strong stimulus to consider actively the composition of their assets. They had to weigh the risk weighting of each type compared to other assets, but they could not simply switch all assets into US Treasury debt, which had a zero risk weighting, for they had to balance risk-weighting effects against the rates of profit yielded by each type. Shareholders expect banks to make a profit by holding a significant proportion of assets that are relatively risky. To judge risk and profit fully they also had to consider the relationship between the composition of their assets and the composition of their liabilities.

As you will see below, banks' attempts to overcome the constraints imposed by capital adequacy requirements led them to adopt measures more radical than adjusting the relative proportions of assets *within* their balance sheets. Especially after 2000, banks took measures that enabled them to originate risky loans (such as sub-prime mortgages, but not only that class of assets) and shift those loans *off* their balance sheets. Those strategies involved radical changes in the nature of banking, making the

banks' business model radically different from the Basic Retail Bank model. They succeeded in enabling banks to carry out whole categories of business that were not constrained by the regulators' risk-weighted capital requirements. As the crisis of 2007–09 has revealed, that model became unsustainable.

### Financial market liberalisation

Governments' liberalisation of financial markets in the 1970s and 1980s led to greater volatility of market interest rates and exchange rates. That created both the impetus to, and the means for, further innovation in banks' financial management. Interest rate volatility and exchange rate volatility created significant new risks and increased the importance of banks managing their assets and liabilities. From 1973, instruments for managing such risks – *financial derivatives* in the form of financial options, futures, forwards and swaps – became widely usable. That is because new techniques (based on the Black-Scholes model) made it possible to price them and because organised markets were constructed for some. Financial derivatives enabled banks to manage asset and liability risks better. They also enabled banks to develop new lines of business by creating derivatives for customers as *over-the-counter* instruments on which the banks earned fees or profit margins.

Those activities were beyond the scope of a Basic Retail Bank (or even a non-basic retail bank) and should be seen as the business of investment banks. Therefore, in order to understand those developments, it is useful to see how the constraints imposed by the Glass-Steagall Act in the United States and by other restrictions in other countries, separating commercial banks from investment banks, were broken down and then entirely abolished. In a series of Acts, Federal Reserve interpretations and court judgements, banks in America gained the right for themselves or subsidiaries to:

- advise on and sell securities (1980)
- establish affiliates with a range of securities activities (1987)
- carry out banking across the nation (1994)
- sell insurance nationwide (1997)
- underwrite a wide range of bond and equity issues (1996).

Finally, most remaining constraints imposed by the Glass-Steagall Act were abolished in 1999 by the passage of the Financial Services Modernization Act.

These changes, together with international agreements on financial services in 1997, enabled banks to merge and grow, engaging in a wide range of both retail and wholesale banking services (or commercial and investment banking services). Several grew to include insurance services and operate as *universal banks*, although universal banking had long been established in the banks of continental Europe and the mix of banking and insurance was mainly a European model – '*bancassurance*'. The

outstanding example was Citigroup, a global bank formed in 1998 by the merger of Citibank and Travelers (principally a large insurance company).

A few US banks, such as Goldman Sachs and the ill-fated Lehman Bros, maintained their specialist focus as investment banks, but large banks that had started out as commercial banks embraced a wide range of bank activities in a search for profit growth that would satisfy investors holding their equity.

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## 1.5 Financial Innovation

In this section we consider the innovations in banking that gathered pace after 2000 (perhaps significantly, that is immediately following the 1999 abolition of the Glass-Steagall Act). Those are the innovations that culminated in the financial crisis that began in 2007.

Three main innovations were at the centre of a boom in the business and profit of banks up to 2007 and the subsequent crisis, which is widely seen as one of the greatest financial crises in history. They are:

- securitisation
- shadow bank institutions
- credit default swaps.

Banks' use of these innovations in combination amounted to a new business model known as '*originate and distribute*' or, more technically '*credit risk transfer*'.

Let us consider each in turn.

### 1.5.1 Securitisation

This involves converting the stream of future income from an asset (such as interest payments on a bank loan) into securities that the bank can sell. Several types of securitisation have been carried out by banks, but the dominant form at the start of this century has been securities created as *Collateralised Mortgage Obligations* (CMOs). These had existed since the early 1980s, but after the 1990s the value of CMOs created and sold by banks rose fast.

Collateralised Mortgage Obligations and similar securities have a particular feature whose refinement permitted that growth. They divide the income streams from the pools of mortgages which back them into different slices or *tranches*, each of which carries different degrees of risk. The highest tranches have a legal status which enables the holder to bear very low risk; even though the underlying pool of mortgages may carry a high credit risk, in case of default the holders of the most senior tranche have a secure, priority claim on the stream. If, for example, homeowners default on the mortgages that are the collateral for the bonds, the lower tranches of bonds lose value first while the highest tranches only bear losses if the total default is greater than the value of the lower tranches of bonds.

issued. In other words, the lowest tranche has no more claim than an equity holder in a company has on a bankrupt company's assets; their claim is only against the residual income stream from the pooled mortgages after higher-tranche security holders have been paid.

Higher tranches could be sold by banks to other banks and to investment funds, which required low risk assets. Even if the mortgages pooled as backing for a CMO were mortgages owed by high-risk home buyers – sub-prime mortgages – the highest tranche of the securities created was given the highest credit rating, *Aaa*, by credit rating agencies and in that way became eligible for purchase by risk-averse investment institutions. The crisis has demonstrated that even if such risk transformation was feasible for an individual security or bank, it could actually increase the riskiness of the banking system as a whole, and the apparent security offered to investors by the highest tranches was not sound.

From the point of view of the originating bank, securitisation transformed the role of risk management. Instead of giving a loan and holding it to maturity, with the risk of the debtor defaulting and other risks (including the risk of full repayment too early), the bank would securitise the assets and sell the security. The important point is that by securitising loans an individual bank could sell the risks involved in the underlying loan (although, as the 2007-09 crisis revealed, the risks to the financial system as a whole might rebound on the individual bank). As a result, banks had less incentive to try to minimise the risk on assets. To put it another way, they believed their asset management could permit the origination of more risky loans for, having sold the risk on instead of holding it, they were not obliged to increase their capital. If they had not sold the risk by securitisation they would have had to increase their capital in proportion to the (risk-weighted) loan.

### **Sub-prime mortgages**

Sub-prime mortgages, in both the United States and the United Kingdom were the outstanding example of banks originating more risky loans. Before the innovations of the late 20th century, homeowner mortgages were mainly provided by specialist lenders (building societies in the United Kingdom) and were subject to conservative lending criteria and rigorous checks of borrowers' status.


The changes in financial management related to securitisation encouraged banks to lend to high-risk borrowers, lend without proper checks, and lend without requiring the borrower to invest any of their own equity (lending more than 100 per cent of the value of the property). Rising defaults on such sub-prime mortgages were the stimulus for the crisis that began to affect banks in 2007. Consequently, the full-scale banking crisis that broke in the autumn of 2008 is often referred to as 'the sub-prime crisis', but that is a misnomer, for it has deeper and wider roots.

At this point we would like you to turn from this text and read a speech given in March 2008 before the full scale crisis broke with the seizing up of banking and financial markets later that year.



### Reading 1.2

Please read 'Financial Innovation: Engine of Growth or Source of Instability?' by William Poole, who was President of the Federal Reserve Bank of St Louis. This is a speech he gave at the University of Illinois in Springfield, March 6, 2008.

 When you have finished reading it, please write 100 words for yourself summarising William Poole's argument. Then add a sentence indicating your estimation of his argument that sub-prime mortgages are like other innovations, and will continue to have a beneficial place in banking.

William Poole (2008) 'Financial Innovation: Engine of Growth or Source of Instability?'

## 1.5.2 Shadow bank institutions

Securitisation enabled banks to originate loans, such as mortgages, without being constrained by the amount of equity capital they had and by the requirement to keep their capital to assets ratio at or above a minimum (a requirement formalised by Basel 1 as a risk-weighted requirement).

If we measure the effect as the ratio of loans owed by borrowers (homeowners in the case of residential mortgages) to banks' capital that represents an increase in leverage. But to see the full picture, we have to examine more carefully the institutions, which hold the mortgages and the collateralised mortgage obligations, and consider their leverage ratios. Securitisation involved innovation in the institutional structure of the financial system; the newly created institutions were not subject to Basel 1 for, although similar to banks, they were created as businesses, which were not formally banks and therefore were free from restrictions imposed by the risk-weighted capital requirements. The nature of a Collateralized Mortgage Obligation required the creation of a Special Purpose Vehicle, an institution that operated as a shadow bank.

### Special Purpose Vehicles

What is the role of a *Special Purpose Vehicle* in securitisation? A *CMO Special Purpose Vehicle* (CMO SPV) is a company (or it could be a limited liability partnership, or trust) that may be set up by a bank for the dedicated purpose of securitisation. Its key features are:

- although established by a bank and, usually, operated by it, it is legally completely separate from the bank
- the CMO Special Purpose Vehicle buys from the bank mortgages which the bank created as loans to homeowners
- to finance these assets, the CMO SPV creates and issues tranches of securities, with defined risk and return characteristics; low risk senior tranches, medium- (mezzanine) risk tranches, and high-risk (equity) tranches.



Let us think about the implications for the bank that created the CMO SPV.

Because the bank has sold the mortgages to the new entity, it has transferred those mortgages off its balance sheet and to the SPV. In other words, the risk attaching to those mortgages – default risk and also interest risk and early repayment risk – has been transferred from the bank to the SPV. The SPV, in turn, has created securities that transfer those risks to the investors that buy them.

The bank which created the SPV and which operates it has no legal responsibility for its debts; the SPV is bankruptcy remote from the bank. But the bank might have a continuing financial relationship with it. It was common for the bank to provide loan facilities to the SPV to assure investors of the SPV's liquidity.

The SPV is not itself classified as a bank and is not subject to banking regulators obliging it to observe a minimum risk-adjusted capital requirement. But it acts as a shadow bank with a function similar to some bank functions.

In addition to Special Purpose Vehicles created in the construction of Collateralized Mortgage Obligations, numerous other institutions were created as banks, and other financial institutions made innovations – and together they amounted to a shadow banking system carrying out lending and borrowing without having the capital and regulatory requirements of banks. Some were Special Purpose Vehicles specialising in different assets, and known by various names such as *Structured Investment Vehicles*. Others were *Hedge Funds*, investment funds with exceptionally high leverage which were not regulated as banks: each Hedge Fund specialises in one of a range of strategies, having transactions of various types in a variety of assets and liabilities, some of them involving securitised assets. All such institutions operated outside the regulations that applied to banks, but, since they carried out bank-like functions, they amounted to a shadow banking system.

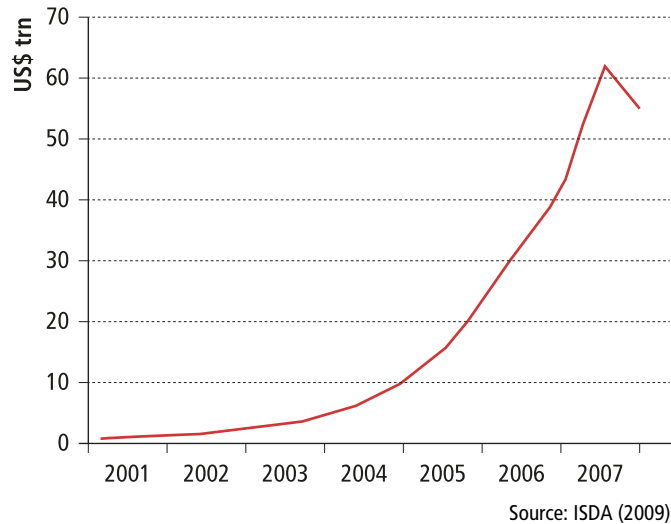
### 1.5.3 Credit Default Swaps

Credit Default Swaps are a form of insurance contract invented in the 1990s. Bank financial management has to distinguish between the different elements of risk attached to the bank's assets. In addition to interest-rate risk and other risks, the main risk on the bank's loans is default risk. In the 1990s JP Morgan invented credit default swaps as a contract which enabled a bank to pay the seller of the contract a stream of premiums payments in return for the seller of the contract paying the value of the asset in the case of default. These contracts were themselves marketable and, unlike a normal insurance contract, banks owning them have to reflect their current value in their accounts on a 'mark-to-market' basis.

For an individual bank Credit Default Swaps transformed the task of bank financial management, for it enabled them to invest in relatively risky assets and, for a price, transfer the risk to another bank, which sells it a

credit default swap. The invention of credit default swaps also generated a new source of profit for banks, which received fees for creating them and could profit from changes in their value. As Figure 1.1 shows, after 2000 the value of credit default swaps outstanding grew at an exponential rate until the end of 2007.

**Figure 1.1 Gambling on Ruin – Credit-default swaps, amount outstanding in US\$ trillions**



### **'Originate and distribute' model of banking**

The changes in banking between 1970 and 2007, and especially the major innovations and growth in banking between 2000 and 2007, have one outstanding feature. Banks have developed powerful instruments for *credit risk transfer*. Credit risk is another name for default risk, and credit risk transfer is its transfer by one bank to another bank, bank-like entity or other investors, for a price.

As a result of these innovations, banks' business model was transformed. Old-fashioned banking, which, in simplified form, we have represented as 'basic retail banking' used asset management that could be described as 'originate and hold'. That means the bank originates a loan, with careful regard to the quality of the borrower and the security provided against the loan, and would hold it until its maturity. By that means, the bank holds and manages the risks on its assets.

The new business model resulting from innovations in credit risk transfer is widely known as 'originate and distribute'. The bank originates a loan and, instead of bearing the risk attached to it, sells the risk to a range of investors willing to bear the risk for a price. To the extent that a bank fits that model its income comes from fees the bank charges for arranging loans, creating credit default swaps and other instruments, creating and operating Special Purpose Vehicles and a wide range of other fee-generating activities.

## 1.6 Implications of Banking Innovations for Bank Financial Management

At the centre of bank financial management is the task of managing the risk on the bank's assets and liabilities. The banking changes outlined in Section 1.4 have transformed that task. That might appear obvious. But is such an apparently obvious statement valid or meaningful?

How has innovation transformed the task of managing a bank's risk?

### Review Question 1.2

Please pause and make a note of the ways in which you think the changes outlined in Section 1.4 have affected the management of a bank's risk.

Most people, including many experts, would find it difficult to give an uncontested answer to that question, but we can try.

A bank that has moved towards an 'originate and distribute' model has transferred credit risk on its assets to others who choose to bear those risks for a price. It does that through means such as securitisation (including but not confined to securitisation of mortgages) and credit default swaps. That reduces the bank's task of financial management; it has less need to manage the risks on its assets and perhaps the risks on mismatches between liabilities and assets.

So far so good. But that is not the end of the matter, for the system as a whole involves risks that could rebound on the individual bank. In fact they did rebound, causing the collapse of several large banks and necessitating government intervention, including nationalisation, to take the banks' risk to the taxpayer. What new types of system risks should financial management of an individual bank take into account in the 'originate and distribute' model? With hindsight, as a result of the crisis, we can easily identify three. You might have identified more:

- incomplete separation
- complexity and non-transparency
- complete market failure.

### Incomplete separation

One risk is that when banks distributed risk through securitisation they did not, in fact, free themselves from all the risk attaching to the securitised assets. As we noted in Section 1.4, a bank creating a Special Purpose Vehicle for securitisation was separate from the SPV and the legal structure prevented creditors (holders of tranches of securities) claiming against the originating bank in case of default.

But there are two ways that the default of an SPV could affect the originating bank because it has not completely separated itself from the SPV. First, the bank often grants a credit line to the SPV as an assurance of liquidity

and, if the SPV defaults, the bank suffers as a creditor of the SPV. Second, the originating bank may have retained some high-risk ('equity') tranches in the securities issued by the SPV as a technique of 'over collateralisation', which gives extra security to senior tranches.

### **Complexity and non-transparency**

The securities created through securitisation took many forms. The collateralised mortgage obligation that we looked at earlier is relatively simple, but securities with more complex features were created in the expansion of securitisation after 2000. Their complexity meant that investors were not able always to assess the risk on them and hence could not accurately value the securities. To an even greater extent, credit default swaps were a new type of derivative instrument that financial managers could not value with justifiable confidence.

As the boom in creating derivative contracts in the form of credit default swaps gathered pace, Warren Buffet, one of the world's most successful investors, warned that the creators and purchasers of derivatives had so little understanding of their risk characteristics and how to value them that they were to be strictly avoided. In 2003 he called derivatives such as credit default swaps (but not only them) 'financial weapons of mass destruction'. Many think that he was proved right (Buffet, 2003: p. 15).

### **Complete market failure**

Active liability management and the originate-and-distribute model involve banks being able to raise cash from wholesale money markets instead of being constrained by the amount of retail deposits customers place with them. Their liability operations involve accessing credit of many types, including overnight money on inter-bank markets. And securitisation of assets depends on the existence of markets for the securities created. A bank's management of its financial risks should take account of the possibility that those markets could simply close, as, indeed, they did after the collapse of Lehman Bros on 15 September 2008. They closed because, in view of the complexity and non-transparency of the securities and derivatives held by banks, each bank had an unquantifiable fear of the riskiness of its counterparty if it were to lend to another bank.

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## **1.7 An Assessment of Credit Risk Transfer**


Now that you have studied some of the main features of modern changes in banking and some implications for bank financial management, we would like you to study an important paper by a distinguished American professor of finance. This is quite a long reading but a very important one for this module, and you should read it particularly carefully – and make sure your notes are sufficiently clear to remind you of the main points.



### Reading 1.3

Please now read the reasoned paper, 'Innovations in credit risk transfer: implications for financial stability', given by Professor Darrell Duffie of Stanford University.

As a main part of your study of this unit, we would like you to read the whole of Duffie's paper, and also the 'Remarks' on the paper given by Mohamed A El-Erian, which are printed at the end of the paper.

 While reading Duffie's paper, and El Erian's comments on it, please make notes on the main points and consider the following two questions:

- In the light of the evidence given by Duffie, what are the arguments for and against thinking that the growth of credit default swaps changed banks' financial management?
- To what extent do you think that Mohamed El Erian accurately describes the main changes when he says that credit risk transfer 'places enormous pressure on banks to shift to greater reliance on an 'originate and distribute' model. As a result, the detailed evaluation and structuring of individual loans gradually gives way to the mass production of composite products, causing the emphasis in risk assessment to move from the credit characteristics of individual borrowers to the extent of correlation within the composite products being originated, warehoused and distributed' (p. 30 of the reading)?

Darrell Duffie (2008) 'Innovations in credit risk transfer: implications for financial stability', a *BIS Working Paper* reprinted in the Module Guide.

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## 1.8 Conclusion

We hope that you enjoyed studying this unit and the core readings. By now you should feel confident that you can:

- discuss the nature of financial management in a simple 'basic retail bank'
- outline the main changes in the United States banking environment from 1970
- analyse the main mechanisms of credit risk transfer developed by banks between 1970 and 2007
- discuss the implications of credit risk transfer for banks' financial management
- relate your understanding of those matters to examples and data.

As a result, you will have developed a good basis for getting to grips with the detailed study of bank financial management in the remaining units of the module.

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