

# Modern Banking

**Shelagh Heffernan**

*Professor of Banking and Finance,  
Cass Business School, City University, London*



John Wiley & Sons, Ltd



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This book is printed on acid-free paper responsibly manufactured from sustainable forestry in which at least two trees are planted for each one used for paper production.

This book is dedicated to my parents, GRH and  
GJH, in their Diamond Anniversary Year

# ABOUT THE AUTHOR

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**Professor Shelagh Heffernan** is currently Professor of Banking and Finance at Cass Business School, City University, London and has been a visiting Professor at several universities. *Modern Banking* is her fourth book.

A former Commonwealth Scholar at Oxford University, Professor Heffernan is also a past beneficiary of a Leverhulme Trust Research Award, which funded new research on competition in banking, and recently received a second award from the Leverhulme Trust. She publishes in top academic journals – her paper, ‘How do UK Institutions Really Price their Banking Products?’ (*Journal of Banking and Finance*) was chosen as one of the top 50 published articles by Emerald Management Review.

Current research includes: SMEs and banking services, the conversion of mutuals to bank stock firms, monetary policy and pass through (funded by an ESRC grant), and M&As in banking. Professor Heffernan is an Associate Member of the Higher Education Academy and has received two Distinguished Teaching and Learning awards.

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All errors and omissions are my responsibility.

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# PREFACE

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This book is a sequel to *Modern Banking in Theory and Practice* published by John Wiley & Sons in 1996. It is a sequel rather than a second edition, because it does substantially more than merely update the 1996 text. In fact, this book has taken much longer to write than the 1996 book! In the eight years since *Modern Banking in Theory and Practice* was published, many aspects of banking have changed considerably, though the key characteristics that distinguish banks from other financial institutions have not. Some might question the need for a book on banking rather than one on financial institutions. While banks remain special and unique to the financial sector, books need to be devoted to them.

*Modern Banking* focuses on the theory and practice of banking, and its prospects in the new millennium. The book is written for courses in banking and finance at Masters, MBA or advanced undergraduate level. Bank practitioners who wish to deepen and broaden their understanding of banking issues may also be attracted to this book. While they often have exceptional detailed knowledge of the areas they have worked in, busy bankers may be all too unaware of the key broader issues and lack perspective. Consider the fundamental question: what is unique about a bank? What differentiates it from other financial institutions? Answering these questions begins to show how banks should evolve and adapt – or fail. If bankers know the underlying reasons for why profitable banks exist, it will help them to devise strategies for sustained growth.

Unlike many other books in this field, the focus of the book is on the microeconomic issues related to banks, covering key areas such as what singles a bank out from other financial institutions, the diversification of banks into non-banking financial activities, different types of banks within a banking structure, bank failures, and so on. There are many excellent books that study the role banks play in the macroeconomy, and/or the contribution of financial institutions/financial sector to an economy. There are also numerous excellent books with detailed descriptions of the financial system in the United States, Britain and other countries, but they cover other types of financial firms and markets, which gives them less space to devote to banking issues. While recognising that banks are an integral part of any financial system, this book is concerned with the key *banking* topics: why they exist, investment, commercial and other types of banks, how they have diversified, risk management, global regulation, banking structures/regulations in key economies, bank failure and crises, banks in emerging markets, and competitive issues. The final chapter provides some case studies – practical applications of many of the ideas and themes covered in the book. Few books provide readers with a systematic treatment

of the key micro banking issues, and it is hoped this volume goes some way to rectifying the deficiency.

These are some of the main themes running throughout the text:

- Information costs, and the demand for liquidity, explain why banks find it profitable to intermediate between borrower and lender. Banks undertake two core functions which single them out from other financial institutions: they offer intermediary and liquidity services. Often, a byproduct of these core functions is the provision of a payments service. Given that banks' core activities involve money, it also means banks play a special role in the monetary economy – their actions can even affect the money supply.
- For shareholder owned banks profits are the prime concern. So too are risks. The way banks earn their profits, through the management of financial risks, further differentiates them. The organisation of risk management, and the development techniques and instruments to facilitate risk management, are crucial to the successful operation of all banks.
- The central intermediary role played by a bank is evolving through time, from the traditional intermediation between borrowers and lenders, through to more sophisticated intermediation as risk managers.
- The objective functions of managers and bank regulators are quite different. Banks are singled out for close regulation because bank failures and crises can, and do, have social as well as private costs associated with them. However, as parts of banking become more complex, regulators increasingly rely on the banks' own risk management models to handle the associated risk. Given that bank managers do not allow for the social costs of bank failure, is the increasing use of banks' own internal risk management models by regulators a development to be welcomed? Another issue: are regulators sophisticated enough to monitor the complex models of risk management in place at the top western banks? Finally, regulation contributes to moral hazard problems, so the regulatory environment needs to give the correct incentives to minimise these problems.
- The international regulation of banks is growing in importance but controversial. Its importance stems not only from the globalisation of banking, but also, because many of the "Basel" rules agreed by the Basel Committee are increasingly seen as the benchmark for good banking regulation by all countries and all types of banks, even though the Basel agreements were originally directed at international banks headquartered in the major industrialised nations.
- Identification of the causes of bank failure and financial crises should help to reduce their incidence, thereby saving taxpayers from expensive bailouts.
- Banks in emerging markets are engaged in the core activities of intermediation and the provision of liquidity. But they have a different agenda from those in the developed world because most face a different set of challenges. No single model of banking applies to all "emerging markets", though many share similar problems such as shortages in capital and trained labour. They have their fair share of crises, too. In addition, there are different forms of banking. Islamic banking is one of the most important. Though not limited to emerging markets, Islamic banking has developed most in countries such as Pakistan, Iran and Malaysia.

- The production function for banks is less clear cut than for firms in other sectors. Are deposits and loans inputs, outputs, or both? How can cost X-efficiency, scale and scope economies, technical progress and competition be measured?
- Mergers and acquisitions, and the formation of financial conglomerates, need not necessarily result in scale economies and synergies. Measurement problems abound, and the empirical evidence is mixed. In the 1990s, there was an unprecedented jump in the mergers and acquisitions among banks, though the trend has slowed somewhat. What are the reasons which encourage merger activity and are they set to continue?
- Even though many banks tend to underperform in the stock markets, the outlook for the highly profitable, innovative banks is good, provided they can create, maintain and sustain a competitive advantage in the products and services (old and new) they offer. Like firms in any sector, banks need to plan how, in the future, existing competitive advantage is going to be sustained and extended.

Chapter 1, The Modern Banking Firm, begins with a review of the traditional theory of banking. A bank is a financial firm which offers loan and deposit products on the market, and caters to the changing liquidity needs of its borrowers and depositors. There are many other types of financial institution, and some banks offer other products and services, but it is these two functions which are banks' distinguishing features and explain why banks exist in modern economies. This definition, in turn, raises another question. Why can't borrowers and lenders come to an arrangement between each other, without intermediaries? There are two reasons. First, any lender confronts a variety of information costs – provided a bank can act as intermediary at a lower cost than an individual or a pool of lenders, a demand for banks' intermediary services should emerge. Second, the liquidity preferences of borrowers and lenders differ. If banks can offer a liquidity service at a lower cost than what borrowers and lenders would incur if they attempted to meet their liquidity demands through direct negotiation, there will, again, be an opportunity for banks. The payments services offered by banks are a byproduct of these intermediary and liquidity functions. As the brief review of payment systems suggests, though banks, historically, have been associated with payments, other parties could provide this service.

Another question relates to the organisational structure of a bank. Chapter 1 draws on Coase's (1937) theory to explain why a firm provides an alternative to market transactions. Loans and deposits are internal to a bank, so the intermediary and liquidity roles are conducted more efficiently under a command organisational structure. Unfortunately, the structure itself creates principal-agent problems, between depositor and bank, shareholders and management, the bank and its employees, and the bank and its borrowers. Differences in information between principal and agent give rise to adverse selection and moral hazard. Relationship and transactional banking can, in different ways, help to minimise these problems in a bank-client relationship. Neither arrangement is without its problems, and different countries display varying degrees of these two types of banking. A separate section identifies the key contributors in the development of the theory of banks, dating back to Edgeworth (1888).

The second part of Chapter 1 provides a brief overview of banking structure, using data from the USA and UK to illustrate the variation in banking systems. The chapter also looks

at the main organisational forms in banking, such as: universal, commercial, investment, merchant banks, holding companies and financial conglomerates.

The final part of Chapter 1 reviews the relationship between banks and central banks. Central banks are usually responsible for price stability, and depending on the country, have been associated with two other roles, prudential regulation and the placement of government debt on favourable terms. These objectives can be at odds with each other, especially price control and financial stability. By the close of the 20th century, more and more governments assigned responsibility for the regulation of banks to another entity, independent of the central bank. Some countries, such as Germany and Canada, have had separate regulatory bodies for decades, but it is a relatively new phenomenon for others as diverse as the UK, Japan and China. The reason for the change may be related to the increased number of financial conglomerates, where banking is one of several key services – central banks have no expertise when it comes to the regulation of other parts of the conglomerate, such as securities and insurance. The argument for bringing the regulation of all financial firms under a separate roof is a powerful one. Nonetheless, it is worth remembering that should a bank (or any other financial group) encounter difficulties that undermine and threaten market liquidity, the central bank will have a critical role to play.

Though intermediation and liquidity provision are the defining functions of banks, regulations permitting, banks usually offer other non-banking financial products and services, or expand their intermediary and liquidity functions across national frontiers. Chapter 2 reviews the diversification into non-bank financial services, including their role in securitisation. The continued growth of securitisation and derivatives has added new dimensions to banks' management of financial risk. While banks continue to address issues arising from the traditional asset liability management, off-balance sheet risk management has become at least as important for some banks. Yet only the major banks and some specialist financial institutions use these instruments extensively. For the vast majority of banks, intermediation and liquidity provision remain the principal services on offer. Also, poor asset management continues to be a key cause of bank failure, making credit risk management as important as ever, alongside the management of market, operating and other financial risks.

Chapter 2 also considers the banks' growing reliance on non-interest income by banks. But does diversification increase income and profitability? How should banks react to the development of new financial methods, such as securitisation, instruments such as derivatives, or technology such as the internet with e-cash? Next, the chapter looks at international financial markets and the growth of international banking. Attention then turns to the relationship between multinational and wholesale banking and the Japanese and American banks that dominate global markets. What do empirical studies reveal about the factors that explain multinational banking activity? What do financial data for banks' profitability, asset growth, relative operating expenses and relative share price performance actually imply? Lastly, Chapter 2 asks how banks can turn potential threats into opportunities. What is the future for cash? More generally, could IT developments threaten core bank functions or will the 21st century see the end of banks as we know them?



While the first two chapters concentrate on why banks exist and the challenges they face, the next three turn attention to related key managerial issues in banking: financial risk management and the prudential regulation of banks. Though there is risk in any business operation, banks face a number of risks that are atypical of most non-financial firms. These financial risks are the subject of Chapter 3, which defines the various risks faced by banks, including credit, counterparty, liquidity (and funding), settlements (or payments), market (or price), interest rate, foreign exchange (or currency), gearing, sovereign/political and operational risks. The chapter covers asset liability management, duration gap analysis and other standard approaches to managing financial risk, as well as derivatives, including futures, forwards, options and swaps. Do the newer methods and instruments reduce risks in the banking system, or, perversely, raise them?

The management of market and credit risk is singled out for special attention, examining issues such as whether techniques like risk adjusted return on capital (RAROC) and value at risk (VaR) quantify and contain risk. The chapter concludes with a review of how risk management is organised in a major bank and the key tools it employs. Appropriate risk management techniques, both on- and off-balance sheet, are absolutely crucial to banks' profitability, and their long-term survival.

The way a bank manages its risk and how it is regulated are increasingly interdependent. Hence, Chapter 3 is followed by two chapters on regulation. Chapter 4 concentrates on international regulation; Chapter 5 covers the structure and regulation of banks in countries with the key financial centres of the developed world. A section on the European Union is also included because of its increasing influence on its members' structure and regulation.

Chapter 4 provides a comprehensive review of the global regulation of banks, signalling the growing importance of international regulations, such as "Basel 1" and "Basel 2". Why are banks singled out for special regulation? Should they be? It also looks at how the enormous increase in global capital flows and the spread of multinational banking has increased the need for the international coordination of prudential regulation. It reviews the logic and content of Basel 1 in 1988, as well as the likely consequences of the new Basel 2. While the Basel Committee's main concern is with the supervision of international banks, other organisations have focused on international financial stability. The respective roles played by these organisations are reviewed. Chapter 4 concludes with a discussion of the key issues now facing policy makers in the area of financial stability and international bank supervision.

Chapter 5 looks at bank structure and regulation in the UK, USA, Japan and the EU. Regulation can have an important impact on the structure of the banking system in a given country, and vice versa. It begins with the United Kingdom when, in 1997, the newly elected Labour government announced that responsibility for bank supervision was to be transferred from the Bank of England to a single regulator for all financial institutions. To understand the reasons behind this major change, it is necessary to look at the recent history of bank regulation in the UK, which is covered in this section.

The idiosyncrasies of the American banking structure are traced to numerous 20th century banking regulations. Over time American banks have been subject to an extensive range of statutes, which govern everything from bank examination and branch banking, to the functional separation of banks. The USA was the first country to introduce

deposit protection legislation in 1933. Many of the laws enacted reflect a commitment to discourage collusive behaviour and regulatory capture. The legacy of these laws is a unique banking structure.

There are over 20 000 deposit-taking firms in the USA, but about half of them are credit unions. Banking systems in most industrialised countries normally have three to five key banks, offering a wide range of wholesale and retail banking services nation-wide. There are some leading global commercial and investment banks located in the USA, they do not dominate the national banking system in the way that leading banks do elsewhere. The US banking structure is fragmented, inward-looking, and showing its age. Take, for example, the payments system. In 1994, this author sent a US dollar cheque (drawn on a US dollar account held in Toronto) to one of the Federal Reserve banks, in payment for an annual conference hosted by them. Payment by credit card was not an option. The cheque was returned several weeks later with an “unable to clear” stamp on it, and an accompanying remark, “*unable to process an international check*”! Reform of the US system has been a long and slow process. It was not until July 1994 that key obstacles to interstate banking were lifted. The old 1933 laws that separated commercial and investment banking were rescinded as recently as 1999. This part of the chapter looks at the likely consequences of these changes.

Until a number of reforms in the 1990s, culminating in Big Bang, 1996, the Japanese banking system was known for its high degree of segmentation along functional lines, and the close supervision of banks by the Ministry of Finance, in conjunction with the Bank of Japan. Many of these regulations helped to shape a Japanese banking structure that has been under serious threat since the 1989 collapse of the stock market. Taxpayer funds and mergers have helped keep the largest Japanese banks afloat. Four mega banking groups now dominate the Japanese banking system. Will these changes be enough to save it?

The European Union’s single market programme reached fruition in 1993. However, the 15 – now 25 – member countries’ banking systems, especially at the retail level, are not yet integrated. This part of Chapter 5 looks at the reasons for this fragmentation, covering questions such as the role of the EU Commission, its feasibility, and whether the objective is a desirable one. It also reviews the role of the European Central Bank and the issue of whether supervision of the EU should remain the responsibility of member states.

Chapter 6 covers banking in emerging markets. They are the source of many financial crises that reverberate around the world. They are also under growing pressure to adopt western regulatory standards. Some developing economies suffer bouts of financial instability; others do not. Foreign banks play an active role in a few developing countries, but they are banned in others. Why, and with what consequences? Why are informal, unregulated financial markets so common? What are the main problems that these countries face? The first section provides a detailed overview of financial repression and reform, with its main focus on Russia, China and India.

The next part of Chapter 6 reviews the principles and practice of Islamic banking. Iran and Pakistan operate Islamic banking systems and ban conventional western banking. Other predominantly Muslim countries display mixed systems, where both Islamic and conventional banks can be found. The main characteristic is the absence of interest payments on deposits and loans, because the *Holy Quran* forbids it. How does this work

in practice? What new products and methods have been devised to ensure the transfer of capital from those in surplus to households and firms in need of it without charging interest? The section concludes with a review of the challenges faced by Islamic banking.

The final topic in Chapter 6 covers sovereign and political risk analysis. This section addresses questions such as why do emerging market economies require external finance? What causes some of them, periodically, to default? What is the nature of sovereign risk and how is it linked to and compounded by political risk?

Having looked at the fundamentals in banking, risk management, regulation, the interaction between regulation and structure, and banking in emerging markets, the book turns to bank failure and financial crises. Chapter 7 considers the causes and consequences of bank failures. It begins with a brief historical review of bank failures, including Overend Gurney (1866), Baring Brothers (1890), and the collapse of more than 3000 US banks during 1930 to 1933. Modern cases of bank failures range from Bankhaus Herstatt (1974) to Barings Bank (1995). *Crédit Lyonnais*, which resulted in one of the most expensive bank rescues to date, is discussed briefly here, because it forms the basis for a case study in Chapter 10. Looking at individual case details helps to identify common themes and derive lessons from these bank failures. Chapter 7 also reports on quantitative models used to identify the determinants of bank failure. A quantitative approach gives more precise answers to questions such as the link between failure and asset management, inadequate capital, low profitability, general managerial incompetence, fraud and macroeconomic factors.

A sufficient number of bank failures can lead to a banking crisis and, ultimately, if not kept in check, a financial crisis. At the close of the 20th century, a financial crisis in Thailand triggered a set of crises throughout the region. Are crises becoming more frequent, and if so, what policies should be used to contain them? Chapter 8 begins with a review of the debate over what constitutes, characterises and causes a financial crisis. Most of the chapter focuses on modern day crises. There is extensive coverage of the South East Asian and Scandinavian financial crises. The ongoing problems with Japan's banks and financial system are used to illustrate how a financial bubble can expand and burst, this time in the world's second largest economy. The circumstances surrounding the near collapse of the hedge fund, Long Term Capital Management (LTCM) are reviewed to illustrate how problems in a small non-bank can, some think, threaten the world financial order. In view of intervention by central banks, the IMF and other official bodies, the final section of this chapter looks at the arguments for and against a lender of last resort, and in some quarters, proposals for an international lender of last resort.

To survive, a bank must be competitive. Chapter 9 asks what factors govern the competitiveness of banks. The chapter reviews the results of tests on productivity, X-efficiency, economies of scale and scope, and technical progress. The chapter also explores the key competitive issues as they relate to banking markets. Most of the empirical tests focus on the structure-conduct-performance (SCP) hypothesis and relative efficiency models. Other researchers have used empirical models to examine the extent to which banking is a contestable market. Recent work on a generalised pricing model is reviewed. Using this approach, the question is: what variables influence the price setting behaviour of banks with respect to their core products, and is there any evidence of Cournot or other types of behaviour? The final section notes the growing trend in mergers and acquisitions in

banking, which was especially pronounced in the 1990s. Some of the extensive empirical literature on bank M&As is reviewed, exploring the causes and consequences of bank mergers.

In Chapter 10, readers can apply the concepts and ideas covered using case studies. The cases cover a range of different themes, which should serve to enhance the reader's understanding of different subjects covered in the text. The *Goldman Sachs* case reviews the lessons learned in the prolonged transition from being a small, private investment bank to a shareholder bank, and the implications it had for governance and performance. It covers a diverse set of topics such as the differences between relationship and transactional banking, how diversification into off-balance sheet banking may still leave a bank exposed to volatile interest rates, and corporate culture. The *Kidder Peabody* case concerns a private American investment bank, but this time, the lessons are quite different. The *Sakura to Sumitomo Mitsuo FG* case gives readers an insight into the workings of a key bank within the tightly regulated Japanese financial structure, and the problems in that sector following the collapse of the stock market. The *Sakura* case provides a good example of the effects on a bank of a speculative bubble; and some of the practical issues raised when two poorly performing banks merge to form a very large financial group.

The *Bancomer* case pinpoints the potential problems with banking in a developing or emerging economy. It covers issues as diverse as privatisation, political risk, and how too much financial liberalisation can upset a fledgling market oriented banking system, creating serious problems for relatively strong banks like Bancomer. Also, the tesobonos swap deals illustrate the need for banks to recognise and remove any deficiencies in risk management, especially after years of operating in a nationalised banking system. Finally, the takeover of most of Mexico's key banks, including Bancomer, by foreign banks raises issues about whether foreign ownership is the best route for emerging market banks in need of capital and skills.

Causes of bank failure and issues relating to bank regulation are demonstrated in the *Continental* and *Crédit Lyonnais (CL)* cases. The CL case also touches on a difficult issue which the European Union will, eventually, have to confront – the extent to which EU states should be allowed to support failing banks. CL also shows how nationalised banks tend to be subject to government interference – for example, CL was used to provide indirect subsidies to other, troubled, state enterprises. Both cases illustrate how management can be a critical factor in the failure of the bank.

The final case is *Bankers Trust: From a Successful(?) Investment Bank to Takeover by Deutsche Bank*. It portrays a bank that underwent a comprehensive change in strategy in a bid to become a global investment bank. The case charts how the bank went about implementing strategic change, and illustrates the problems a bank might encounter if customer focus takes a back seat to product focus. It also reviews how Bankers Trust revised its risk management systems to reflect the growth of off-balance sheet business and derivatives. The case demonstrates why it is vital for a bank to understand how derivatives and other off-balance sheet instruments are used, especially when advising large corporate customers. BT was weakened by its failure to do so, a contributory factor in its takeover by Deutsche Bank. Has Deutsche Bank succeeded where Bankers Trust failed?

## Guidelines on How to Use this Book

The presentation of this book is organised to give the reader/instructor a flexible means of reading and/or teaching. The material is largely non-technical – it is the ideas and concepts that are challenging, not the statistics. It is advisable to cover Chapter 1 and, possibly, Chapter 2 first, but subsequent chapters can be taken in the order chosen by the reader/instructor. If the course is being taught to undergraduates with little or no relevant work experience, then Chapters 1 & 2 and 3 to 8 should be taught first, though the subject order can be varied and used over two single semester courses. Most of the chapters are self-contained, enabling instructors to pick and choose the material they wish to cover. Inevitably, this means there is some overlap, but giving flexibility to lecturers is important.

The case studies may be taught either concurrently, or as a separate set of exercises at the end of subject lectures. Course leaders of Masters/MBA modules may have students with a background in the financial sector who are capable of covering the case studies without doing much background reading. However, for most groups it is advisable to use the relevant chapters to back up the cases, because most classes have some students with good practical banking experience, but little in the way of a formal training in the micro-foundations of banking; others will have completed related courses in economics and finance, but will not have looked at banking issues *per se* and have little or no exposure to banking in the “real world”.

It is worth emphasising to the student group that the “real world” nature of case studies means they involve a variety of themes, concepts and issues that affect different parts of bank/financial firms. Cases are likely to cut across subject boundaries. Students may come across a term/topic that the lectures have not yet covered – ideas and themes arising in a particular case do not fall neatly into lecture topics. Students should be encouraged to use new ideas to enhance their learning skills. Overall the learning experience from the case study should include: practical and general applications of topics which reinforce lecture material, learning to think laterally, and learning to work effectively in a group. Students should be encouraged to treat such challenges as part of the learning experience, following up on the new material when necessary.

The questions at the end of each case study are set to test the reader’s command of the case, and ability to link these cases to the ideas covered in the text. Students with background courses in introductory economics and quantitative methods will be able to progress more quickly than those without. It is possible to cover the material in the absence of an economics and/or quantitative course, by deviating to teach some basics from time to time. For example, in Chapter 1, if a group has no economics, the instructor may find it useful to explain the basic ideas of supply, demand and the market, before progressing to Figures 1.1 and 1.2. To fully appreciate some parts of Chapters 7, 8 and 9, it may be necessary to give a brief review of basic econometric techniques.

**Important Note:** Throughout the book, the \$ (dollar) sign refers to nominal US dollars unless otherwise stated. When a local currency is reported in dollars, it is normally converted at that date’s exchange rate.



# WHAT ARE BANKS AND WHAT DO THEY DO?

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## 1.1. Introduction<sup>1</sup>

The term “banking” can be applied to a large range of financial institutions, from savings and loans organisations to the large money-centre commercial banks in the USA, or from the smallest mutually owned building society to the “big four” shareholder owned banks in the UK. Many European countries have large regional/cooperative banks in addition to three to five *universal* banks. In Japan, the bank with the largest retail network is Sumitomo Mitsui Banking Corporation,<sup>2</sup> but its main rival for savings deposits is the Post Office.

The objective of this chapter is to provide an overview of banking and the role played by banks in an increasingly complex financial world. It begins with a review of the meaning of banking, identifying the features of banks that distinguish them from other financial institutions. The most common forms of organisational structure for banks in the developed world are reviewed in section 1.3. Section 1.4 considers the relationship between the central banks and commercial banks, including key debates on the functions and independence of a central bank. The chapter ends with a brief summary of the major theoretical contributions to the banking literature, followed by conclusions.

## 1.2. The Meaning of Banking

The provision of deposit and loan products normally distinguishes banks from other types of financial firms. Deposit products pay out money on demand or after some notice. Deposits are *liabilities* for banks, which must be managed if the bank is to maximise profit. Likewise, they manage the *assets* created by lending. Thus, the core activity is to act as *intermediaries* between depositors and borrowers. Other financial institutions, such as stockbrokers, are also intermediaries between buyers and sellers of shares, but it is the taking of deposits and the granting of loans that singles out a bank, though many offer other financial services.

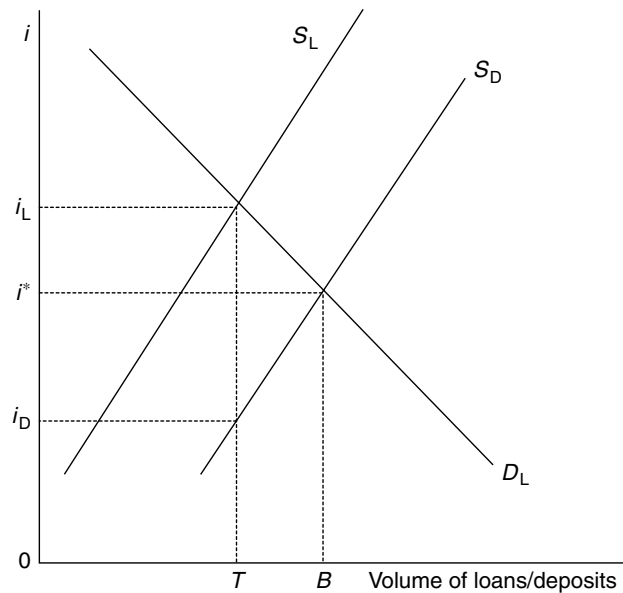
To illustrate the traditional intermediary function of a bank, consider Figure 1.1, a simple model of the deposit and credit markets. On the vertical axis is the rate of interest ( $i$ );

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<sup>1</sup> © No part of this chapter is to be copied or quoted without the author's permission.

<sup>2</sup> This banking giant is the result of a merger between Sakura and Sumitomo Mitsui Banks in April 2001.

Figure 1.1 The Banking Firm–Intermediary.



$i_L - i_D$ : bank interest differential between the loan rate ( $i_L$ ) and the deposit rate ( $i_D$ ) which covers the cost of the bank's intermediation

$S_D$ : supply of deposits curve

$S_L$ : supply of loans curve

$D_L$ : demand for loans curve

OT: volume of loans supplied by customers

$i^*$ : market interest rate in the absence of intermediation costs

the volume of deposits/loans appears on the horizontal axis. Assume the interest rate is exogenously given. In this case, the bank faces an upward-sloping supply of deposits curve ( $S_D$ ). There is also the bank's supply of loans curve ( $S_L$ ), showing that the bank will offer more loans as interest rates rise.

In Figure 1.1,  $D_L$  is the demand for loans, which falls as interest rates increase. In Figure 1.1,  $i^*$  is the market clearing interest rate, that is, the interest rate that would prevail in a perfectly competitive market with no intermediation costs associated with bringing borrower and lender together. The volume of business is shown as OB. However, there are intermediation costs, including *search*, *verification*, *monitoring* and *enforcement* costs, incurred by banks looking to establish the creditworthiness of potential borrowers. The lender has to estimate the riskiness of the borrower and charge a premium plus the cost of



the risk assessment. Thus, in equilibrium, the bank pays a deposit rate of  $i_D$  and charges a loan rate of  $i_L$ . The volume of deposits is  $OT$  and  $OT$  loans are supplied. The interest margin is equal to  $i_L - i_D$  and covers the institution's intermediation costs, the cost of capital, the risk premium charged on loans, tax payments and the institution's profits. *Market structure* is also important: the greater the competition for loans and deposits, the more narrow the interest margin.

Intermediation costs will also include the cost of administration and other transactions costs related to the savings and loans products offered by the bank. Unlike individual agents, where the cost of finding a potential lender or borrower is very high, a bank may be able to achieve *scale economies* in these transactions costs; that is, given the large number of savings and deposit products offered, the related transactions costs are either constant or falling.

Unlike the individual lender, the bank enjoys *information economies of scope* in lending decisions because of access to privileged information on current and potential borrowers with accounts at the bank. It is normally not possible to bundle up and sell this information, so banks use it internally to increase the size of their loan portfolio. Thus, compared to depositors trying to lend funds directly, banks can pool a portfolio of assets with less risk of default, for a given expected return.

Provided a bank can act as intermediary at the lowest possible cost, there will be a demand for its services. For example, some banks have lost out on lending to highly rated corporations because these firms find they can raise funds more cheaply by issuing bonds. Nonetheless, even the most highly rated corporations use bank loans as part of their external financing, because a loan agreement acts as a *signal* to financial markets and suppliers that the borrower is creditworthy (Stiglitz and Weiss, 1988).

The second core activity of banks is to offer *liquidity* to their customers. Depositors, borrowers and lenders have different liquidity preferences. Customers expect to be able to withdraw deposits from current accounts at any time. Typically, firms in the business sector want to borrow funds and repay them in line with the expected returns of an investment project, which may not be realised for several years after the investment. By lending funds, savers are actually agreeing to forgo present consumption in favour of consumption at some date in the future.

Perhaps more important, the liquidity preferences may *change over time* because of unexpected events. If customers make term deposits with a fixed term of maturity (e.g., 3 or 6 months), they expect to be able to withdraw them on demand, in exchange for paying an interest penalty. Likewise, borrowers anticipate being allowed to repay a loan early, or subject to a satisfactory credit screen, rolling over a loan. If banks are able to pool a large number of borrowers and savers, the liquidity demands of both parties will be met. *Liquidity* is therefore an important service that a bank offers its customers. Again, it differentiates banks from other financial firms offering near-bank and non-bank financial products, such as unit trusts, insurance and real estate services. It also explains why banks are singled out for prudential regulation; the claims on a bank function as money, hence there is a "public good" element to the services banks offer.

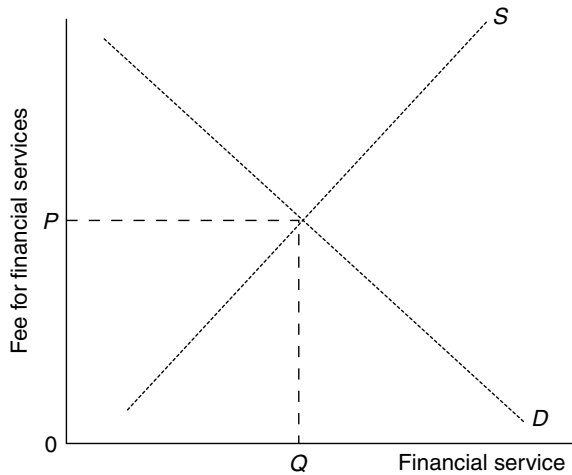
By pooling assets and liabilities, banks are said to be engaging in **asset transformation**, i.e., transforming the value of the assets and liabilities. This activity is not unique to banks. Insurance firms also pool assets. Likewise, mutual funds or unit trusts pool together a large

number of assets, allowing investors to benefit from the effects of diversification they could not enjoy if they undertook to invest in the same portfolio of assets. There is, however, one aspect of asset transformation that is unique to banks. They offer savings products with a short maturity (even instant notice), and enter into a loan agreement with borrowers, to be repaid at some future date. Loans are a type of finance not available on organised markets.

Many banking services have non-price features associated with them. A current account may pay some interest on the deposit, and offer the client a direct debit card and cheque book. The bank could charge for each of these services, but many recoup the cost of these “non-price” features by reducing the deposit rate paid.<sup>3</sup> On the other hand, in exchange for a customer taking out a term deposit (leaving the deposit in the bank for an agreed period of time, such as 60 days or one year), the customer is paid a higher deposit rate. If the customer withdraws the money before then, an interest penalty is imposed. Likewise, if customers repay their mortgages early, they may be charged for the early redemption.

Figure 1.1 does not allow for the other activities most modern banks undertake, such as off-balance sheet and fee for service business. However, the same principle applies. Figure 1.2 shows the demand and supply curve for a fee-based product, which can be anything from

Figure 1.2 The Banking Firm – Fee Based Financial Products.



(For example, arranging a syndicated loan; deposit box facilities)

*P*: price for fee based services  
*Q*: quantity demanded and supplied in equilibrium

<sup>3</sup> In some countries, banks charge for each item, such as statements, cheques, etc., or offer customers a package of current account services (monthly statements, a fixed number of “free” cheques per month, etc.) for a monthly fee. In the UK, banks do not normally charge personal customers for writing cheques, statements, etc.

deposit box facilities to arranging a syndicated loan. The demand and supply curves are like any other product, and the market clearing price,  $P$ , is determined by the intersection of the demand and supply curves. Again, market structure will determine how competitive the price is. Banks will operate in other “non-banking” financial markets provided they can create and sustain a competitive advantage in each of them.

Banks do not necessarily charge a direct price for their services, as suggested by Figure 1.2. Many modern banks offer stockbroking services to their customers, and “make markets” in certain equities. In this case, some or all of the “fee” may be reflected in the difference between the *bid* and *offer* price, that is, the price the bank pays to purchase a given stock and the price the customer pays. The difference between the two is the spread, which is normally positive, since the bid price will always be lower than the offer price, so the bank, acting as a market maker, can recoup related administrative costs and make a profit. Again, the amount of competition and volume of business in the market will determine how big the spread is. When the bank acts as a stockbroker, it will charge commission for the service. Suppose a bank sells unit trusts or mutual funds.<sup>4</sup> Then the price of the fund often consists of an initial charge, an annual fee, and money earned through the difference between the bid and offer price of the unit trust or mutual fund.

This discussion illustrates how complicated the pricing structure of banks’ products/services can be. Non-price features can affect the size of the interest margin or the bid–offer differential. Hence, assessing the pricing behaviour of banks is often a more complex task compared to firms in some other sectors of the economy.

### 1.3. Organisational Structures

The intermediary and payments functions explain why banks exist, but another question to be addressed is why a bank exhibits the organisational structure it does. Profit-maximising banks have the same objective as any other firm; so this question is best answered by drawing on traditional models. Coase (1937), in his classic analysis, argued that the firm acted as an alternative to market transactions, as a way of organising economic activity, because some procedures are more efficiently organised by “command” (e.g., assigning tasks to workers and coordinating the work) rather than depending on a market price. In these situations, it is more profitable to use a firm structure than to rely on market forces.

The existence of the “traditional” bank, which intermediates between borrower and lender, and offers a payments service to its customers, fits in well with the Coase theory. The core functions of a bank are more efficiently carried out by a command organisational structure, because loans and deposits are internal to a bank. Such a structure is also efficient if banks are participating in organised markets. These ideas were developed and extended by Alchian and Demsetz (1972), who emphasised the monitoring role of the firm and its creation of incentive structures. Williamson (1981) argued that under conditions of uncertainty, a firm could economise on the costs of outside contracts.

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<sup>4</sup> Mutual funds (USA) or unit trusts (UK) offer the investor a package of shares, bonds, or a combination of both. The investor purchases units in the fund, as do many other investors. It is managed by the bank or investment firm offering the fund.

### 1.3.1. Banks and the Principal Agent Problem

The nature of banking is such that it suffers from *agency* problems. The *principal agent* theory can be applied to explain the nature of contracts between:

- the shareholders of a bank (principal) and its management (agent);
- the bank (principal) and its officers (agent);
- the bank (principal) and its debtors (agent); and
- the depositors (principal) and the bank (agent).<sup>5</sup>

Incentive problems arise because the principal cannot observe and/or have perfect information about the agent's actions. For example, bank shareholders cannot oversee every management decision; nor can depositors be expected to monitor the activities of the bank. Bank management can plead bad luck when outcomes are poor.

*Asymmetric information*, or differences in information held by principal and agent, is the reason why banks face the problem of *adverse selection* because the bank, the principal, normally has less information about the probability of default on a loan than the firm or individual, the agent. Though not shown in Figure 1.1, the presence of adverse selection may mean the supply of loans curve is discontinuous at some point. *Adverse selection* is the reason why the supply curve is discontinuous or even backward-bending (with respect to certain borrowers), and shows that bankers are more reluctant to supply loans at very high rates because as interest rates rise, a greater proportion of riskier borrowers apply for loans. The problem of *adverse incentives* (higher interest rates encouraging borrowers to undertake riskier activities) is another reason why banks will reduce the size of a loan or even refuse loans to some individuals or firms.

#### Box 1.1 Example of Adverse Selection: Robert Maxwell

In the 1980s, most of the major American and British banks in the City of London had dealings with Robert Maxwell. At the time of his death in 1991, Mr Maxwell owed £2.8 billion to a large group of banks. Little, if any, of it was recovered. The Department of Trade and Industry had censured Robert Maxwell for his business practices in 1954. In 1971, they declared him unfit to run a public company. Despite Maxwell's background, and secrecy about the links of over 400 firms within the publicly owned Maxwell Communication Corporation, banks were attracted to Maxwell because he was prepared to pay high fees and comparatively high rates of interest on his loans, a classic example of *adverse selection*. *Herd instinct* was also evident. Goldman Sachs, the prestigious investment bank, accepted Mr Maxwell's custom in the late 1980s, originally to buy/sell MCC shares; the loans, options and forex dealings came later. The bank was well known for a high moral tone, which included refusing to take on clients with even a hint of bad reputation, but the New York Committee overruled the misgivings expressed by the London office, possibly because the business was confined to the sale and purchase of MCC shares. For many banks, Goldman Sachs' acceptance of Maxwell as a client was a signal that he was financially sound, and they agreed to lend to him.<sup>6</sup>

*Moral hazard* is another problem if the principal, a customer, deposits money in the agent, a bank. Moral hazard arises whenever, as a result of entering into a contract, the

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<sup>5</sup> For a more theoretical treatment, see Bhattacharya and Pfleiderer (1985), Diamond (1984) and Rees (1985).

<sup>6</sup> For more detail, see the Goldman Sachs case (Chapter 10).

incentives of the two parties change, such that the riskiness of the contract is altered. Depositors may not monitor bank activities closely enough for several reasons. First, a depositor's cost of monitoring the bank becomes very small, the larger and more diversified is the portfolio of loans. Though there will always be loan losses, the pooling of loans will mean that the variability of losses approaches zero. Second, deposit insurance schemes<sup>7</sup> reduce depositors' incentives to monitor the bank. If a bank can be reasonably certain that a depositor either cannot or chooses not to monitor the bank's activities once the deposit is made, then the nature of the contract is altered and the bank may undertake to invest in more risky assets than it would in the presence of close monitoring.

Shareholders do have an incentive to monitor the bank's behaviour, to ensure an acceptable rate of return on the investment. Depositors may benefit from this monitoring. However, even shareholders face agency problems if managers maximise their own utility functions, causing managerial behaviour to be at odds with shareholder interest. There are many cases of bank managers boosting lending to increase bank size (measured by assets) because of the positive correlation between firm size and executive compensation. These actions are not in the interests of shareholders if growth is at the expense of profitability.

### 1.3.2. Relationship Banking

*Relationship banking* can help to minimise principal agent and adverse selection problems. Lender and borrower are said to have a **relational contract** if there is an understanding between both parties that it is likely to be some time before certain characteristics related to the contract can be observed. Over an extended period of time, the customer relies on the bank to supply financial services. The bank depends on long-standing borrowers to repay their loans and to purchase related financial services. A relational contract improves information flows between the parties and allows lenders to gain specific knowledge about the borrower. It also allows for flexibility of response should there be any unforeseen events. However, there is more scope for borrower opportunism in a relational contract because of the information advantage the borrower normally has.

The Jürgen Schneider/Deutsche Bank case is a good example of how relationship banking can go wrong. Mr Schneider, a property developer, was a long-standing corporate client of Deutsche Bank. Both parties profited from an excellent relationship over a long period of time. However, when the business empire began to get into trouble, Schneider was able to disguise ever-increasing large debts in his corporation because of the good record and long relationship he had with the bank. Schneider forged loan applications and other documents to dupe Deutsche and other banks into agreeing additional loans. In 1995, he fled Germany just as the bank discovered the large-scale fraud to cover up what was

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<sup>7</sup> Deposit insurance means that in the event of the bank going out of business, the depositor is guaranteed a certain percentage of the deposit back, up to some maximum. Normally banks pay a risk premium to a deposit insurance fund, usually administered by bank supervisors.

essentially a bankrupt corporation. After nearly 3 years in a Florida prison, Mr Schneider gave up the fight against extradition and was returned to Germany to face the biggest corporate fraud trial since the end of the Second World War. In 1998, he was convicted of fraud/forgery and given a prison term of 6 years, 9 months. The judge criticised German banks for reckless lending. Outstanding loans amounted to \$137 million. Deutsche Bank apologised for improper credit assessment, especially its failure to follow proper procedures for loan verification.

### 1.3.3. Transactional or Contract Banking

An arms-length *transactional* or *classical contract* is at the other extreme and gives rise to *transactional banking* – where many banks compete for the customer’s business and the customer shops around between several banks to find the best deal. Little in the way of a relationship exists between the two parties – both sides stick to the terms of the contract. A transactional contract deters opportunistic behaviour and because each contract is negotiated, both parties can bargain over terms. On the other hand, information flows will be significantly curtailed and the detailed nature of the contract reduces the scope for flexibility.

It is important to treat the definitions given above as two extremes, at either end of a spectrum. In reality, most banks will offer a version of relationship banking to some customers or apply it to some products, while contract-like banking is more appropriate for other clients and/or services. For example, virtually all customers who enter into a loan agreement with a bank will sign a legally binding contract, but if the customer has a good relationship with the manager and a good credit history, the manager is likely to allow a certain degree of flexibility when it comes to enforcing the terms of the contract. For new clients, the manager will be more rigid.

Relationship banking is most evident in countries such as Japan and Germany, where there are cross-shareholdings between banks and non-financial corporations. In other countries, including the USA and the UK, classical contracts are the norm. In Japan and Germany, the close bank–corporate relationships were, in the 1970s and 1980s, praised as one of the key reasons for the success of these economies. However, in the 1990s, relationship banking declined because of global reforms, which increased the methods for raising corporate finance and the number of players in the market.

Furthermore, the serious problems in the Japanese financial sector that began in 1990 have undermined *keiretsu*, the close relationship enjoyed by groups of firms, including a bank. The bank plays a pivotal role in the group because it provides long-term credit to the main firm and its network of suppliers, as well as being a major shareholder. The bank also gives the *keiretsu* advice and assistance in overseas ventures. With the steady rise in the number of key banks facing bankruptcy, primarily as a result of problem loan portfolios, and a drastic reduction in the market value of banks’ equity portfolios due to the prolonged decline in the stock market, the relationships between banks and corporations have been seriously undermined.<sup>8</sup>

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<sup>8</sup> See Chapter 8 for more detail.

### 1.3.4. Payment Systems: A Byproduct of the Intermediary Process

One theme of this chapter is that banks differ from other financial firms because they act as intermediaries and provide liquidity. Banks require a system for processing the debits and credits arising from these banking transactions. The payment system is a byproduct of intermediation, and facilitates the transfer of ownership claims in the financial sector. Credits and debits are transferred between the relevant parties. In the UK alone, there were over 28 billion cash payments in 2001, but they are expected to decline to 24 billion by 2010. £113 billion was withdrawn from the 34 300 Automatic Teller Machines (ATMs) in 2000.<sup>9</sup> In the same year, there were 3 billion plastic card transactions with UK merchants.

However, there are two key risks associated with any payment. Banks must manage the following.

- *Liquidity risk*: The settlement is not made at the expected time so that assets/liabilities cannot be transferred from one agent to another via the system.
- *Operational risk*: Arising from the threat of operational breakdowns, preventing timely settlement. For example, the hardware or software supporting the system may fail. System breakdowns can create liquidity risk. Given the open-ended nature of the term, it is difficult to provide a precise definition, which makes measurement problematic.

The international payments system is described in the section on international banking in Chapter 2. In the UK, payments are organised through the following.

- **APACS** (Association for Payments Clearing Services): An umbrella organisation formed in late 1984, and made up of BACS, CCCL and CHAPS. It was supposed to allow relatively easy entry of banks into the UK payments system. Membership is offered to all participants with at least 5% of total UK clearing. Financial firms that do not qualify for membership but offer products requiring clearing and payments are made associate members.
- **BACS Limited**: An automated clearing house for non-paper-based bulk clearing, that is, standing orders, direct debits and direct credits. Fourteen direct members sponsor about 60 000 other institutions to use the system. As can be seen from Table 1.1, BACS clearing volumes stood at 3.7 billion in 2002.
- **CCCL** (Cheque and Credit Clearing Company Limited): Responsible for paper-based clearing, i.e., cheques. In 2002, there were 2.4 billion cheque transactions (see Table 1.1), which is forecast to fall to 800 million by 2012.<sup>10</sup>
- **CHAPS**: Provides Real Time Gross Settlement (RTGS) for high value payments, and is the second most active in the world. In 1998, the average value of transactions processed was £2.3 million, compared to £552 for BACS. In 2000, there were some 25 million

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<sup>9</sup> Source: APACS (2003).

<sup>10</sup> Source: APACS (2003).

Table 1.1 UK: total transactions by volume (millions)

	1990	1995	2000	2003
Cash payments	28 023	26 270	27 910	25 859
Cheques	3 975	3 203	2 699	2 251
ATM withdrawals	1 045	1 471	2 027	2 373
Number of ATM cards	47	55	73	88
Plastic cards*	1 741	2 413	3 914	5 317
BACs clearing	1 820**	2 476	3 527	4 060
CHAPS clearing	9**	13	25	33
Cheque & credit	2 513**	2 314	1 981	1 660

\* Includes debit, credit, charge and store cards.

\*\* 1992 figures.

Source: APACS (2003), "Payments: Facts and Figures", [www.apacs.org.uk](http://www.apacs.org.uk)

transactions worth £49.1 billion; transactions had risen to 31 million by 2002. CHAPS Euro was formally launched in January 2001, to process euro payments between members, with monthly volumes of 280 000, valued at 3600 million euros.<sup>11</sup> It also provides the UK link to TARGET (see below). The real time nature of the settlement eliminates settlement/liquidity risk, unlike BACS, which settles payments in bulk.

- **CLS:** Created to reduce risks associated with payments involving another currency. It will gradually replace the standard foreign exchange settlement method, where a correspondent bank is used. In 2002, CLS introduced real time payment for foreign exchange transactions.
- **CREST:** Settlement of Securities. Central bank-related transactions moved to real time in 2001, and the idea is to introduce it for all money market instruments – payments are still made at the end of the day on a net settlement basis. The London Clearing House (LCH) acts as a central counterparty for transactions on the financial exchanges, and for some over the counter markets. At the end of 2003, LCH merged with its Paris counterpart Clearnet, creating Europe's largest central counterparty clearing house. It will go some way to creating a pan-European clearing house, reducing the cost of cross-border trading in Europe.

### 1.3.5. Use of Cards and ATMs

In the mid to late 1990s, there was a continued rapid growth in the use of cards instead of cheques. This point is illustrated in Table 1.1. This table also illustrates that cash payments over the decade and into the new century are fairly stable, and ATM withdrawals have more than doubled. Cash payments remain the dominant payment method, making up three-quarters of all payments, and their dominance will continue, though there might be a slight decline once social security benefits are paid directly into accounts. The use of cheques as a form of payment has fallen dramatically, as households and businesses switch

<sup>11</sup> The source for all figures cited for CCCL and CHAPS is APACS (2003).



to the use of plastic cards or direct debit/credit. About 3% of card transactions were via the internet in 2002, and by 2012, APACs is forecasting this to grow to 10%.<sup>12</sup> The ATM network in the UK is run by LINK, which is jointly owned by the banks and building societies. Via LINK, customers have access to over 34 000 ATMs. There are two credit card schemes: Mastercard, owned by Europay, and Visa, part of Visa International. There are also two debit card schemes: Switch and VisaDebit.

Cruikshank (2000) reports that the payment schemes (APACS, Visa, etc.) and ATM network are dominated by the “big four” banks<sup>13</sup> because the size of shareholdings is normally determined by the volume of transactions in a given scheme. Cruikshank criticised the consequences of this control, which was to take advantage of their monopoly position. Other users of the network were being charged excessive amounts, which had to be passed on to their customers or absorbed in their costs. For example, internet banks had to pay twice as much for access to the system as the big four, and retail outlets were charged excessive prices to offer a direct debit/credit card service to their customers. Cruikshank reported that the fee charged bore no relation to the cost of the investment undertaken by the big four. The big four banks paid the lowest prices to use the system, and, for a brief period, account holders faced charges if they used a rival’s machine, though a vociferous public campaign forced banks to largely abandon this practice.

Cruikshank recommended the establishment of an independent regulator for the payment systems: Paycom. Access would be via a licence, the price of which would reflect the cost of use by a given bank. It could also ensure entrants were financially sound, to minimise settlement and liquidity risk. For example, with the exception of CHAPS, the systems are not based on real time gross settlement,<sup>14</sup> so any bank that failed while it was still using the payments system could strain the liquidity of the system. The British government accepted the need for reform, and referred the matter to the Office of Fair Trading. It has announced the introduction of PaySys, a rule-based system to regulate the payments industry (the Treasury will draft the relevant details), which does not go as far as the “public utility” approach represented by Paycom. An alternative is the “competing network” model,<sup>15</sup> whereby there are several large networks that compete for banks to join them.

The clearing system in the United States is quite different. The Federal Reserve Bank operates a number of cheque clearing centres, which are responsible for about 35% of US cheque clearing, which amounted to \$13.4 billion in 1998.<sup>16</sup> Private centre arrangements made between banks account for another 35%, and about 30% is cleared by individual banks. In 1998, \$16 billion worth of electronic payments were processed through one of 33

<sup>12</sup> The source of these projections is APAC (2003).

<sup>13</sup> At the time, National Westminster Bank, Hong Kong and Shanghai Banking Corporation (HSBC), Barclays and LloydsTSB. NatWest was taken over by the Royal Bank of Scotland in 2000, and Lloyds dropped to fifth position after the merger between Halifax and the Bank of Scotland (to form HBOS) in 2001. It is no surprise that the largest banks control the network. Only very large banks are able to finance the associated costly technology.

<sup>14</sup> It normally takes 3 to 5 working days for a transaction to be completed. For example, if a customer withdraws money from an ATM, it may not be debited from the account for 2 days; in the case of debit cards used at retailers, or a transfer of funds from one account to another, it can take up to 5 working days.

<sup>15</sup> These terms are from Anderson and Rivard (1998).

<sup>16</sup> Source: BIS (2000), tables 8 and 9 (pp. 95–96). All 1998 figures for ACHs, CHIPS and Fedwire are from the same tables.

automatic clearing houses (ACHs) run by the Federal Reserve or one of the private ACHs. International interbank transactions are handled by CHIPS, the Clearing House Interbank Payments System. It is run by the privately owned New York Clearing House Association. CHIPS uses *multilateral netting*. Until 2001, all net obligations were cleared at the end of the day, but a new bilateral and multilateral algorithm means most payments will be settled promptly through a given day, thereby reducing settlement risk. In 1998, there were roughly 60 million settlements, with a total value of about \$350 trillion.

*Fedwire* is operated by the Federal Reserve and allows banks (that keep deposits or have a clearing facility with the Federal Reserve) to send and receive payments. With more than 11 000 users (1998) there were over 98.1 million transactions worth \$328.7 trillion. Fedwire has offered net settlement facilities since 1999, which has reduced members' exposure to settlement risk.

In Europe, TARGET (Trans-European Automated Real Time Gross Settlement Express Transfer System) was set up in response to the European Monetary Union. It means central banks can transfer money within each EU state. It consists of 15 national RTGS systems, the European Central Bank Payment Mechanism (EPM) and SWIFT,<sup>17</sup> which interconnects these systems. Since the settlement is immediate, in real time, it eliminates settlement risk, because the payments are deducted from and credited to the relevant accounts immediately.

TARGET is viewed as a harmonised system, and greater harmonisation is expected in the future. According to BIS (2003f), TARGET processes over 211 000 payments each day, valued at €1.3 trillion. Though TARGET eliminates settlement risk, operational risk is considerable. For example, in 1999, a system error at one of the very large banks meant it was unable to process payment orders for foreign exchange, money market transactions, securities settlement and customer payment. The backup system also broke down because it relied on the same software. Manual systems could not cope, so that many large value payment and securities orders were not settled until the next day – this operational breakdown effectively recreated settlement risk.

Apart from the TARGET arrangement for central banks, the situation in Europe looks bleak. With the introduction of the euro in 2002, there is a need for a payments system that allows for quick settlement within Euroland. Instead, there is a plethora of bilateral agreements between different banks. Eurogiro was set up in 1992 by 14 countries' giro clearing organisations, and a similar system, Eufiserv, operates among the European savings banks. Some moves have been made to link CHAPS with its equivalent in France (SIT), Switzerland (SIS) and Germany (EAF), but no formal agreement has been reached. The large number of independent arrangements (that do not include all banks) will hamper cross-border settlement even if banks are all using one currency, the euro. The cost of cross-state settlement in Europe is estimated to be substantially higher than in the United States.

Increasingly, the responsibility for payments and securities clearing is being unbundled from the traditional bank functions, and given to a third entity, which is not necessarily

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<sup>17</sup> SWIFT (Society for World-wide Interbank Financial Telecommunications): Established in Belgium in 1973, it is a cooperative company, owned by over 2000 financial firms, including banks, stockbrokers, securities exchanges and clearing organisations. SWIFT is a messaging system, for banking, foreign exchange and securities transactions, payment orders and securities deliveries. The network is available 24 hours a day, every day of the year.

another bank. These firms are providing a service to banks: processing settlements and securities for a large number of banks, reducing banks' back office operations. In other words, back office functions are becoming the sole activity of certain firms, which the banks pay, rather than having their own back office operations. According to BIS (2001, p. 310), in the USA, the top five non-bank service providers make up 20% of the outsourcing market.

### 1.3.6. An International Comparison of Payments Technology

Figures 1.3–1.6 illustrate how the pace and form of payments-related technological innovation has varied widely among the different industrialised countries. Figure 1.3 shows that ATMs are more plentiful in Japan and North America than in Western Europe. In Europe, Denmark has the fewest ATMs relative to population, followed by the UK and the Netherlands. The other European countries are roughly the same. The change in the UK is surprising because, in the 1980s, it was one of the leading ATM countries in Europe. It is consistent with the large number of branch closures in the UK, and ATMs have not spread in sufficient numbers to other sites, such as supermarkets, rail and petrol stations.

Turning to Figure 1.4, Germany stands out as having relatively few Electronic Funds Transfer at Point of Sale (EFTPOS) machines, followed by Italy, the USA and Portugal. However, while the ratio of population to EFTPOS is 466 in Germany, it is half that in the USA. Countries with relatively more machines include Spain, Switzerland, Canada and France.

Switzerland, Japan and the USA have relatively high paperless credit transfers (Figure 1.5), while some of the continental European countries rank at the bottom – France, Portugal, Italy and Belgium. Figure 1.6 shows the USA, Canada and the UK have the highest value of payments by credit and debit cards, with some of the continental countries lagging

Figure 1.3 Average population per ATM.

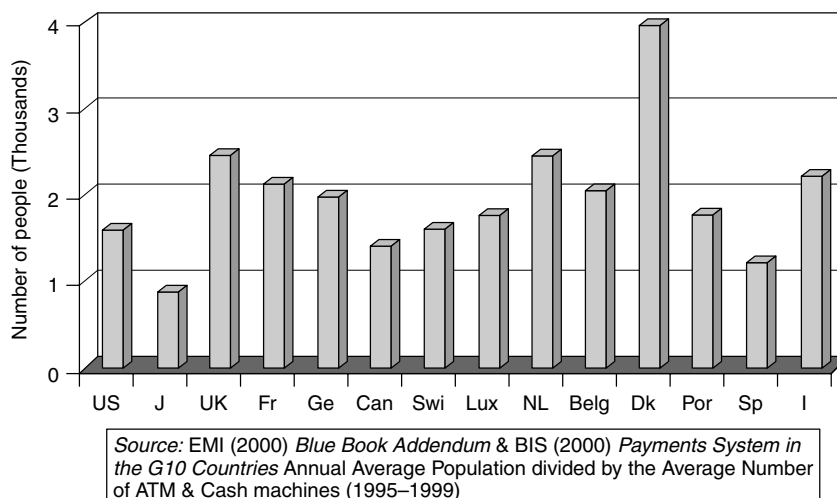


Figure 1.4 Average population per EFTPOS machine.

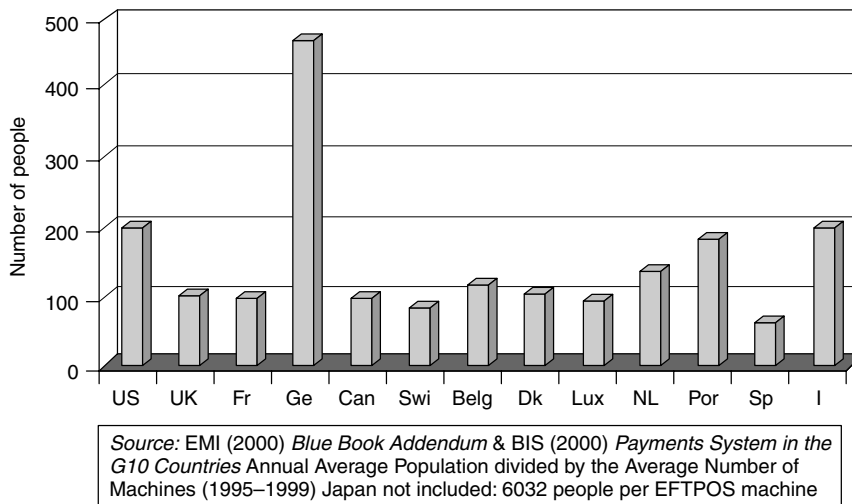
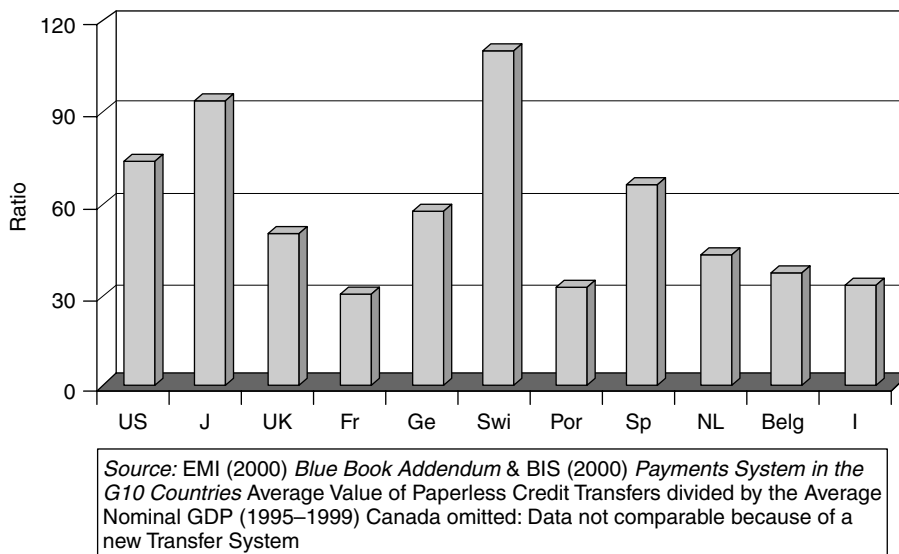


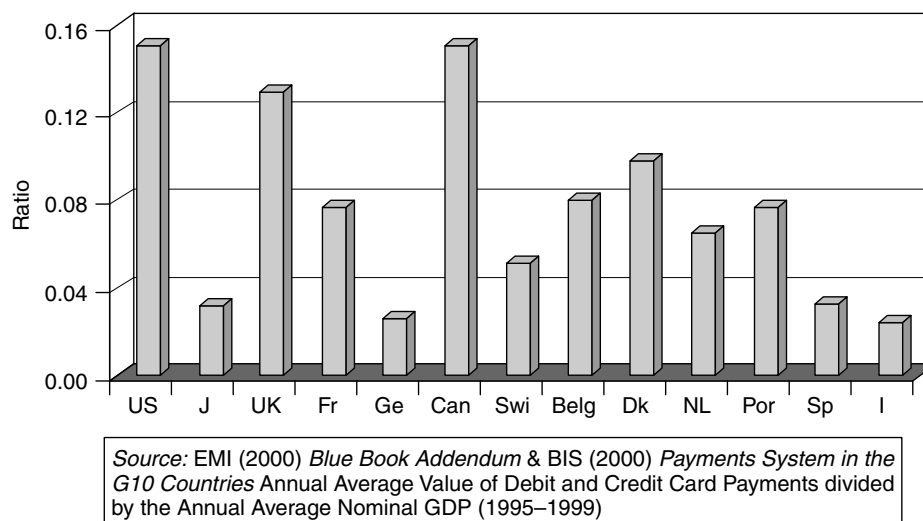
Figure 1.5 Ratio of value of paperless credit transfers to nominal GDP.



behind – especially Germany, Italy and Spain. The use of credit and debit cards in Japan is also low, compared to other countries.

*Correspondent banking* and *custody services* are also part of the payments system. *Correspondent banking* is an arrangement whereby one bank provides payment and other services to another bank. Reciprocal accounts, which normally have a credit line, are used to facilitate

Figure 1.6 Ratio of value of payments by debit and credit cards to nominal GDP.



payments through the correspondent bank. *Custody services* involve the safekeeping and administration of securities and other instruments on behalf of other banks or customers. Globally, the number of banks offering these services has declined, as a small number of large banks dominate an increasingly consolidated market. For example, the Bank of New York has opted to be a niche player, offering global custody services to other banks, managing \$6.3 trillion worth of custody assets in 2000. Banks specialising in these services normally have sound reputations, offer a fairly large range of products and services that are easily obtainable, participate in key payment and settlement systems, and can raise liquidity.

## 1.4. Banking Structures

### 1.4.1. Some Comparative Figures

The structure of banking varies widely from country to country. Often, a country's banking structure is a consequence of the regulatory regime to which it is subject, a topic that is covered in some detail in Chapter 5. Below, different types of banking structures are defined. These different banking structures do not alter the *core functions* of banks, the provision of intermediation and liquidity, and, indirectly, a payment service, which are the *defining* features of banks.

Table 1.2 shows the top 10 banks by assets and, in recent years, *tier 1 capital*, defined as equity plus disclosed reserves. The USA leads the way in 1996, when seven of its banks were in the top 10. In the 1990s, US banks were hard hit by global, then domestic, bank debts. By 1997, Japanese banks had replaced US ones, with six leading banks,

Table 1.2 The Top 10 banks, 1969–2003

	1969 (assets)	1994 (assets)	1997 (assets)	1997 (tier 1 capital)	2001 (assets)	2001 (tier 1 capital)	2002 (tier 1 capital)	2002 (assets)	2003 (tier 1 capital)
USA	7	1	0	3	3	3	3	2	3
Japan	0	6	6	3	2	3	3	3	3
UK	1	1	1	1	1	1	1	1	2
France	1	1	1	1	1	1	1	1	2
Germany	0	0	1	1	2	1	1	0	0
Netherlands	0	0	0	1	0	0	0	2	0
Switzerland	1	0	0	0	1	0	0	1	0
China	0	1	1	0	0	1	1	0	0

Source: *The Banker*, various July issues.

measured by assets, though the figures are less dramatic when banks are ranked, for the first time, by tier 1 capital. Note how Japanese banks shrink (by asset size) between 1997 and 2001/2. This partly reflects the serious problems in the Japanese banking sector, a topic to be discussed at greater length in Chapter 8. What is surprising is that Japan's tier 1 capital hardly changes in the period 1997–2000, when the Japanese banks were suffering from serious problems. The reason there is little change in the rankings is because of mergers among the top, but troubled, Japanese banks, especially in 2000/1. Consolidation also took place in the USA during the same period, albeit for different reasons.

Dramatic differences in banking structure can be seen by comparing the UK and USA. Tables 1.3 and 1.4 illustrate this. Table 1.3, which gives figures for the UK, is divided into

Table 1.3 UK Banking Structure, 1997 and 2002  
 (a) 2002

Financial institutions	Number	Assets (£bn)
All banks resident in UK, of which:	517	4 663
Foreign (branches & subsidiaries)	281	2 161
UK incorporated, of which:	236	2 472
(1) Commercial	35	1 455
(2) BS + mortgage banks	78	683
(3) Other UK owned	53	52
(4) Foreign owned	70	281
Insurance companies, of which:	782	1 018
Life	182	942
Non-life	600	76

BS: building societies.

Source: IMF (2003), which claims sources from the Bank of England, BIS, FSA, and their own estimates.

Table 1.3 (continued)  
(b) 1997

Financial institutions	Number	Assets (£bn)
All banks in the UK	466	2 643
UK owned banks	112	1 254
EU owned banks	110	608
US owned banks	39	207
Japanese owned banks	19	186.3
Building societies	141	167.7
Building Societies	141	

Sources for assets of banks and building societies: Bank of England (2000), Statistical Abstract, tables 3.2.1– 3.2.6; 16.2.

Sources for number of institutions: Bank of England website, <http://www.bankofengland.co.uk/mfsd/abst/ab1ukbks.doc> and British Bankers Association (2000), *Abstract of Banking Statistics*.

Table 1.4 US banking structure, 1997 and 2004

Type of bank	US assets (\$bn)		Number		% of total assets	
	1997	2000	1997	2004	1997	2004
Commercial*	4 771	6 239	9 308	7 769	77.6	79
Savings institutions	1 030	1 223	1 852	1 413	16.7	15
Credit unions	349	na	11 328	9 529	5.6	6
Total	6 150	7 462	22 488	18 711	100	100
Securities firms & investment banks	Capital – 30*		7 776*	5 286		

Sources: Table constructed from 1997 figures quoted in Saunders (2000), *Financial Institutions Management*, London: McGraw Hill, chapters 1, 3, which in turn are supplied by the FDIC (second table) and the Federal Reserve Bulletin. 2004 figures obtained from the FDIC website.

\*1996 figures.

parts (a) and (b) because the figures are not strictly comparable between 1997 and 2002. Of 420 banks in the UK in 1997, 88 were UK owned,<sup>18</sup> compared to nearly 22 500 US banks. US bank numbers, due to consolidation, are falling – they fell by about a quarter between 1997 and 2000. Even so, compare the 35 commercial banks in the UK in 2002 to over 7700 in the USA.

Table 1.5 shows that in 1996 and 1999, the USA had 10 000 more deposit-taking institutions than the other 10 major western countries combined. At the same time, it does not appear to be over-banked compared to some other countries with much smaller populations. In 1999, the USA had nearly 3500 inhabitants per branch, compared to its

<sup>18</sup> Along with 67 building societies, which are mutually owned.

Table 1.5 Number of Depository Institutions and Population per Branch

	No. of Inhabitants per Branch		No. of Institutions	
	1996	1999	1996	1999
Belgium		1 221		121
Canada	1 857	2 233	2 497	2 108
France		2 350		1 672
Germany	1 169	1 481	3 509	2 995
Italy		1 400		878
Japan	1 634	1 961	4 635	3 169
Netherlands	2 277	2 523	126	123
Sweden	2 291	2 249	125	123
Switzerland	946	1 097	372	336
UK	1 611	1 743	561	506
USA	2 772	3 469	23 123	21 070

Source: BIS (1998, 2001), *Statistics on Payment Systems in the Group of 10 countries*.

neighbour, Canada, with a tenth of the population and 2233 inhabitants per depository institution.

The figures for Canada, France and Germany should be treated with caution. The Canadian banking structure in Canada is similar to that of the UK, with four banks holding a very large percentage of assets and deposits. *Caisses populaires* in Quebec, along with a large number of credit unions, make the numbers look big. In fact, these organisations have a tiny market share, by any measure. The figures also mask the importance of the cooperative movement in certain countries, especially France and Germany. Furthermore, Germany has a large number of regional banks, which somewhat dilute the dominance of the big universal banks such as Deutsche Bank and Dresdner, but again, their respective market shares are quite high. Together with the large number of “thrifts” (savings and loans), the USA has many more deposit-taking institutions, mainly because of the regulatory structure that discourages interstate and intrastate branching, and the Glass Steagall Act (1933) that required banks to be either investment or commercial, but not both. However, reforms in the 1990s should increase consolidation and could lead to nation-wide banking.<sup>19</sup>

Japan displays a lower population per bank branch than some countries in Western Europe. In Table 1.5, it ranks seventh – Germany, Italy, Belgium and Switzerland all have fewer inhabitants per branch. However, the figure for Japan may be biased downwards because it excludes the 24 000 Post Office outlets in that country, where on average about 35% of the country’s deposits are held. Western European countries differ widely, with extensive branch networks in Switzerland and Belgium, but relatively few in Denmark, the Netherlands and France. The main organisational banking structures are discussed below.

<sup>19</sup> For more detail, see a brief discussion in section 4 and the detailed review of US bank regulation in Chapter 5.