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Competition and Stability in Banking

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Preface

Governments interfere in the banking sector to ensure financial stability. The role of the government (through supervisors and regulators) may change in light of the various trends in global, European and national financial markets. This study explores this changing role of government by analysing the trade-off between competition and stability in banking. In particular, the study identifies areas where competition potentially endangers financial stability and elaborates on how governments can deal with the trade-off.

By combining the expertise from four different units and the expert knowledge from outside commentators, CPB has been able to engage in this project on banking markets. The research has been carried out by Marcel Canoy (chapters 2, 4 and 5), Machiel van Dijk (chapter 5), Jan Lemmen (chapters 3 and 7), Jurgen Weigand (chapters 2, 3, 4 and 6) and was coordinated by Ruud de Mooij (chapters 1, 4 and 8). In addition, Miguel Manjon from the University of Reus contributed to chapters 4 and 6 during his visit to CPB. Kathy Schuitemaker was indispensible in finalizing the report.

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Director of CPB

1 Introduction and overview

The banking sector in Europe is subject to continuous change. Banks are taking up new types of business in order to diversify their risk; new players such as insurance companies, credit card providers, and non-financial companies enter market segments which used to be the territory of commercial banks; and banks increasingly operate outside their home country or merge with cross-border partners. These developments, triggered by new information technology, disintermediation, deregulation, and the arrival of the Euro, change the landscape in the banking sector and raise a number of policy issues. What are the implications for competition among banks? How can financial stability best be maintained in this changing market? Is there a conflict between increasing competition among banks and stability?

Increased competition in the banking sector may endanger the stability of the financial system. For instance, intensified competition might force banks to engage in riskier operations to make up for squeezed profit margins. Higher overall risk may raise the probability of a bank failure and thus hurt the confidence of the public in the financial system. Therefore, large sizes of banks and a moderate pace of competition could be a safeguard against systemic instability. The principal aims of this study are to verify the validity of this claim. To make it more precise, we explore the conditions under which there exist indeed a trade-off between competition and stability.

One motivation for studying this trade-off is that the reshaping of the financial landscape may call for a reconsideration of policies regarding competition, regulation and supervision. For instance, do we need to limit competitive forces in order to maintain financial stability? Or can some forms of competition improve financial stability, for instance by providing more information? A second motivation for this study is that there seems to be a gap in the literature on the interaction between competition and stability. As Allen and Gale (2000c, p. 268) put it: "Surprisingly, the relationship between stability and competition has not been studied as extensively as one might expect. On the one hand, there are many models of competition in the literature ... On the other hand, there is a well-developed literature on bank crises ... But there is little on the impact of competition on stability." This study aims to contribute to the literature by explicitly focussing on this interaction.

The study is split into two parts. Part I is of a general nature and forms a guide to the debate on competition and stability in banking. Part I contains chapters 2-4. Chapters 2 and 3 provide an overview of the literature on, respectively, competition among banks, and stability in the banking sector. Chapter 4 presents an analytical framework to identify cases where competition and stability interact. That chapter also elaborates on a number of trends that potentially change the trade-off between competition and stability.

Part II of the study uses the analytical framework developed in chapter 4 to discuss the trade-off between competition and stability in three special cases (chapters 5 - 7). These are retail banking,

corporate governance in banking, and the Euro repo markets. The choice for these three cases is somewhat arbitrary: other markets or different topics might have been equally valid in illustrating the trade-off between competition and stability in banking. Each of the three illustrations, however, is motivated in its own right. Retail banking is a straightforward choice since there seems room on the Dutch market to increase competition without endangering stability. Corporate governance receives much attention in public debates recently and, as we will show, is a crucial element in the discussions on competition and stability in banking. The study on the Euro repo market is chosen because of the substantial changes going on in this market, its enormous size, and the lack of economic literature. The three illustrations also indicate the broad range of topics that can be covered by the analytical framework of part I in the study.

A brief summary

We now elaborate in more detail what the various chapters deal with. Chapter 2 elaborates on competition among banks. Starting from an industrial organization perspective, we discuss what competition in this market means and what factors can endanger or enhance competition. Thereby, we focus on various competition issues, including concentration, market power, entry barriers and multi-market competition. The chapter concludes that the oligopolistic banking market is prone to weak competitive forces. Although there seems room for welfare improvement in favour of consumers, this is typically difficult to achieve by means of competition law.

Chapter 3 discusses stability issues in banking. It starts with a discussion on market failures that form the origin of the potential threat to stability. Whether instability is indeed triggered, however, depends on shocks and the channels of contagion. We discuss several types of shocks that can be responsible for instability and demonstrate how instability of one bank can spread to other banks. Chapter 3 also gives an overview of the instruments regulators have at their disposal to deal with the threat of instability.

Chapter 4 discusses three trends in the banking environment: technological change, institutional reform and disintermediation. These trends provoke a number of behavioural responses by banks and other financial institutions. This changes the structure of the banking market. For instance, it leads to consolidation, conglomeration and increasing pressure for international merger activity. Some developments in banking have serious implications for competition and stability. Chapter 4 develops an analytical framework to explore how increased competition in light of these trends affects financial stability. This framework forms the basis for three illustrations in the second part of the study.

Chapter 5 focuses on retail banking. It reveals that there are only a few players in most retail sub-markets in the Netherlands. There are high sunk costs (mainly due to reputation), high switching costs and low transparency. This implies that there is room for anti-competitive

behaviour. Indeed, it seems that the benefits of competition in Dutch retail markets are not fully exploited yet. More intense competition may thus bring welfare gains to the consumer. Some trends, such as technological change, are likely to spur competition in the near future. But how will this affect financial stability?

Chapter 5 shows that the danger of financial instability is real. For instance, new entry in the deposit market may create excess capacity of incumbents and excessive risk taking by entrants; in mortgage markets an expanding market may contribute to an asset bubble; and in the market for small and medium sized enterprises, fierce competition can lead to loans provision to high-risk investments.

These threats to stability do not necessarily imply that increased competition should be prevented. In contrast, chapter 5 claims that increased competition accentuates the importance of prudential regulation, especially regarding the new players. Moreover, effective corporate governance becomes more important to the extent that prudential regulation is unable to maintain stability. To illustrate, effective corporate governance should prevent managers from pursuing goals that are not in the long-term interest of the firm. Chapter 5 also argues that intensified competition between incumbents is unlikely to threaten stability. Hence, measures to encourage the intensity of competition, e.g. by enforcing number portability, increasing transparency and limiting cross-shareholdings between competing firms, are to be applauded.

Chapter 6 elaborates on corporate governance structures in banking. It argues that increased competition puts banks under pressure by reducing profits. To make up for this, managers may embark on riskier strategies, especially if their remuneration is performance-based. This may increase the risk of a bank failure. The implied trade-off between competition and stability is not straightforward, however. Rather than destabilise the system, increasing competition can bolster stability as it reveals, condenses and utilises dispersed or latent information, thus overcoming divided knowledge. As the potential for market failure in banking is very much the result of informational problems, competition fosters stability by exposing inefficient and badly performing banks. A core interest of corporate governance is to design incentives and control mechanisms such that adverse incentives, as, for example, managers taking excessive risks and thus putting the firm at stake, are eliminated or avoided. Competition may serve as a governance mechanism because it exposes inefficient market players with ineffective control structures.

Chapter 6 stresses the importance of "good" corporate governance. Banking supervision should be directed at forcing banks to implement transparent ownership and management structures, with clear lines of accountability and responsibility, independent non-executive directors on the banks' boards, and monitored risk analysis. One direction to make ownership structures more transparent is to simply not allow cross-shareholding arrangements among direct or indirect competitors. Such ownership arrangements serve primarily as shields against

takeovers, reduce product market competition, and do not unequivocally overcompensate the negative effect on competition by significantly improving systemic stability.

Chapter 7 deals with the Euro repo markets. The enormous capital flows in this market and the lack of economic literature on this topic make an analysis of this market worthwhile. Increased competition in terms of higher trading volumes, more players, a greater diversity of counterparties, and broader range of securities will increase the efficiency of the EU repo market. Policy can act here as catalyst for change. Chapter 7 argues that, in order to lower costs in repo markets, there is a pressing need to standardise market practices and to consolidate the various systems for clearing and settlement into one system. Lower costs would encourage entrance of new participants, increase the willingness to use repos and imply substantial welfare gains.

More competition in the repo market, however, also makes the financial system more vulnerable for instability, especially because of systemic and contagion risk. Hence, promoting competition for liquidity through cross-border repos without having sufficient regard to these risks may be problematic. This holds especially in an environment with legal uncertainty and careless risk management. Again, this emphasizes the importance of good corporate governance. The dangers of systemic risk and contagion seem to be most serious in the early stages of EMU. Once a more mature repo market structure has emerged, the problems are likely to be less severe.

Part I: Theory and evidence on competition and stability in banking

2 Competition in banking

Economists embrace competition because it stimulates market players to be efficient. Efficiency means to achieve a goal at its lowest cost which is important in a world of scarce resources. The most natural and intuitive meaning of competition is that individuals are able to *freely* enter into business activities when they find it profitable to do so. In other words, opportunities for gain will not be left unexploited, economising on scarce resources. If competition is *perfect* in the textbook sense, all opportunities for gain have been exploited and an efficient allocation of the available resources has been achieved. Perfectness comes about under ideal conditions, such as perfect and complete information and costless market entry and exit. These conditions are hardly ever met in reality so it is the task of economists to make clear how far real-world markets deviate from the ideal and what the welfare consequences are. The literature on industrial organization deals with the theory and empirics of *imperfect* competition. In this chapter, we will take an industrial organization perspective to discuss competition in banking.[1] In particular, we provide an overview of the theoretical and empirical literature on competition in banking. We identify reasons for why the banking sector may not be perfectly competitive. This chapter and the next (on stability) form the basis for our analysis of how to enhance competition without endangering stability.

2.1 Banking

Financial intermediation and banks

In general, one might say that the function of the financial system is to smoothly channel funds from savers to borrowers and transfer returns from borrowers back to savers. The financial system provides liquidity (allowing for easy exchange of an asset for another), risk sharing (allowing savers to hold many assets) and information (gathering and communication). Two kinds of financial institutions are at work to achieve this: financial markets, which match savers and borrowers directly, and financial intermediaries who match them indirectly. The indirect matching is widely known as financial intermediation. Financial institutions encompass depository institutions (commercial banks, savings institutions, credit unions), contractual savings institutions (insurance companies, pension funds), investment institutions (mutual funds, finance companies), securities market institutions (investment banks, brokerage firms, organized exchanges), and government (-backed) financial institutions (federal credit agencies, loan guaranteeing agencies). In Europe, the depository, investment and securities functions of financial institutions have traditionally been provided under the umbrella of universal banking.

[1] For accessible introductions to the theory of industrial organization and its applications the non-expert reader is referred to the textbooks of Cabral (2000), Carlton and Perloff (2000) or Church and Ware (2000). Davis (1995) as well as Feixas and Rochet (1997) apply industrial organisation models to banking.

Universal banks differ from traditional banks in that the latter comprise banks whose current operations consist of granting loans and receiving deposits from the public (Freixas and Rochet, 1997, p. 1). Universal banks at the same time engage in these and other activities such as investment banking, insurance, fund management, etc. Compared to the US and Japan, banks play a more important role for financial intermediation in Europe. To illustrate, in EMU bank loans as a percentage of total financial assets accounted for nearly half of the total financial assets in 1999. In the US and Japan, this ratio was around 10% and one third, respectively (Merrill Lynch, 2000). Indeed, compared to EMU, financial markets (i.e. the markets for bonds and equity) play a greater role in the USA and Japan.

Intermediaries exist because transaction costs of intermediated exchange are lower than the costs of direct transacting between market participants. Transaction costs can be lower because the intermediary has a well-known address and quality. She will match market parties with a higher probability in a shorter period of time, Thus, sellers and buyers reduce their time costs of search and bargaining. The intermediary in the Box example can be a non-financial firm or a financial firm, such as a bank. Nothing is special about financial intermediaries so far. Therefore, before making financial intermediaries a special case one has to show that the intermediation function performed by financial firms is different from the general function of being an economiser. A vast theoretical literature has investigated why financial intermediaries exist, what makes them unique compared to non-financial intermediaries and where precisely reductions in transaction costs are realised.[2]

In this study, we concentrate on the role of banks as financial intermediaries. Banks are special for a number of reasons. First, an important difference to non-financial firms is that banks provide the financial means for production rather than produce any physical goods. What makes this activity more complex than, say, smoothing frictions in transaction technologies, is that banks trade in financial contracts (loans and deposits) which are not easily marketed or marketable. These contracts are thus on a bank's balance sheet until the contract expires. By contrast, financial securities (stocks, bonds) tend to be easily marketable because the identity of the holder does not matter (anonymity) and liquid trading markets exist. Further, the design of loan contracts differs in general significantly from depositor contracts. Deposits have convenient maturity, no size restrictions and entail low risk, whereas loans are of longer maturity, have larger sizes and are subject to credit risk. This qualitative and quantitative difference in inputs and outputs gives rise to the activity for which banks are mainly identified for as being special: collect small, short-termed and low-risk deposits (which form part of a bank's liabilities side) and

[2] See e.g. Fama (1980, 1985), Allen (1990), Hellwig (1991), Bhattacharya and Thakor (1993), van Damme (1994), Freixas and Rochet (1997), Allen and Santomero (1997), Boot and Thakor (1997), Das and Nanda (1999) for analyses, discussions and references.

transform them into larger, longer-term and higher-risk loans (which make up an important fraction of a bank's asset side). Borrowing short (from savers) and lending long (to borrowers) makes traditional banking a risky business which is quite different from the input-output transformations of non-financial intermediaries or manufacturing firms. For example, banks face credit risk because they cannot be sure to select "profitable" borrowers who do not default on the loans taken out.

A second reason why banks are special is that significant scale and scope economies may exist. For instance, organisational fixed costs imply economies of scale while the joint provision of deposit and credit activities can produce important economies of scope.

A third feature of the banking market is that there exist externalities associated with instability of one player. In particular, the failure of one bank can be contagious and spread to other banks, especially when these banks are linked to the failing institution through interlocking claims (e.g. via clearing-houses and correspondent deposits). Because of this disruptive force of contagion bank failures may have much more serious repercussions (high deadweight costs) for the economy than large-scale failures of non-bank firms.

A fourth feature of banking is that asymmetric information is particularly pronounced, raising the potential for market failure. The directors and managers of financial institutions usually have better information about the soundness of their own financial institution than consumers (depositors, investors). Consumers are not in the position to judge the safety and soundness of the institution with which they are dealing.

Banking markets

Theoretical models usually start from the assumption that the market under investigation is given. That is, the delineation of what constitutes “the banking market” is solved by assuming market boundaries to be well-defined. In practice, defining the “relevant market” to identify those firms which indeed serve the same market and thus compete with each other, is frequently neither an easy task nor does it yield clear-cut and accepted-by-all outcomes. For a long time banking was shielded by regulation from the business of other financial institutions or non-financial companies. The relevant market could then be defined based on the notion that, on the supply side, exclusively "banks" can be market players. Entry into this market could only occur from establishing a new bank (*de novo* entry). Deregulation as well as financial and technological innovations have blurred market boundaries. Over the past few years, we have been observing "disintermediation", that is, the removal or circumvention of banks as middlemen in the savers-borrowers chain. The number of suppliers of financial services has increased rapidly with insurance companies, credit card operators, consumer finance firms etc. invading the traditional territory of commercial banks. Conversely, banks are diversifying into insurance and other areas unrelated to the traditional banking business. Entry costs may be substantially lowered through the Internet. Electronic commerce and electronic banking affect

the delineation of both geographic and product market boundaries. Geographically, competition can come from all over the world. However, switching costs may increase and lock customers in, leaving them with a smaller than the globally relevant bundle of products. Banking is a multi-product business with intricate links between different (sub-) markets (deposits, lending, fee businesses etc.) and different groups of customers (depositors, private and commercial borrowers, investors etc.). Therefore, it is not obvious what constitutes the relevant market. And, when the financial sector continues the recent pace of change, today's relevant market may not exist tomorrow anymore.

Defining relevant banking markets is not straightforward.[3] The standard approach in antitrust cases dealing with the banking sector has been to define banking markets as geographically local and to consist of the cluster of financial products offered by banks (Amel and Starr-McCluer, 2001). The underlying idea is that households and small-medium enterprises (SME's) shop locally, not globally, and that they purchase a set of products from their banks. For a variety of banking products this approach may still be valid, but for an increasing number of products this approach has become obsolete. Technology (the "death of distance"), internationalisation, and the emergence of non-banks offering financial services, blur boundaries between markets.

Recent US empirical evidence (Cyrnak and Hannan, 1999; Amel and Starr-McCluer, 2001) suggests that the traditional antitrust stance is still relevant for deposit accounts and most other household services. It is much less relevant for credit and loans services. Because the evidence is mixed, and Dutch banks are usually active on all markets (however defined), for the purpose of this study we will often treat competition matters as if there is "one Dutch banking market" with four big players (ING, ABN/AMRO, Fortis and Rabo). When we discuss concrete cases, such as retail banking, we use relevant markets that acknowledge above trends.

2.2 Competition and welfare

Banking markets have an innate tendency to become concentrated because of inherent indivisibilities. Put differently, firm size matters in banking. Concentration and large firm size can be bad for competition, since they may help create, maintain and exploit market power to the detriment of consumers. For our purposes, we define market power as a producer's ability to raise and sustain a good's market price above its marginal cost of production. The question is how market power affects total welfare. Total welfare not only includes the benefit of consumers but also producers' profits. Limiting market power reduces producers' profits. Under increasing returns to scale however, producers need to exercise some market power in order to have an incentive to produce at all.

[3] See Kwast, et al. (1997).

Market Power in the Lending and Deposits Markets

Assume an oligopolistic market with a finite number of banks $i = 1,...,n$, offering homogenous loans and deposits at total costs, C, given by (1)

$$C_i\,(D_i\,,\,L_i) = c_D\,D_i + c_L\,L_i + f \tag{1}$$

where D denotes the volume of deposits collected, L the volume of loans granted, c the respective (constant) marginal cost of intermediation and f the fixed cost of intermediation. Let $0 \le \alpha < 1$ denote the share in deposits held as compulsory cash reserves at the Central Bank, r_L the interest rate on loans, r_D the rate on deposits and r the exogenously determined rate on the interbank market (money market rate). Bank profits Π are given by

$$\Pi_i = [r_L\,(L_i + L_{-i}) - r]\,L_i + [r(1-\alpha) - r_D(D_i + D_{-i})]\,D_i - C_i \tag{2}$$

with $L_{-1} \equiv \sum_{j=1,j\neq i}^{n} L_j$ and $D_{-i} \equiv \sum_{j=1,j\neq i}^{n} D_j$ denoting the volume of loans and deposits of all banks except i.

In a quantity-setting oligopoly every bank i maximizes (2) by choosing the Cournot-Nash quantities of deposits and loans $(D_i^*,\,L_i^*)$, taking the quantities of deposits and loans of competing banks as given, $(D_{-i}^*,\,L_{-i}^*)$. The first-order conditions of maximizing (2) yield the standard "marginal revenue equals marginal cost" rule which can be transformed into the well-known Lerner index representation

$$\frac{r_L - (r + c_L)}{r_L} = \frac{1}{n\varepsilon_{r_L}} \tag{3a}$$

$$\frac{r(1-\alpha) - c_D - r_D}{r_D} = \frac{1}{n\varepsilon_{r_D}} \tag{3b}$$

where $\varepsilon_{r_L} \equiv -\frac{r_L\,\partial L}{L\,\partial r_L} > 0$ and $\varepsilon_{r_D} \equiv \frac{r_D\,\partial D}{L\,\partial r_D} > 0$ are the price elasticities for loans and the supply of deposits

respectively. Condition (3a) states that, at a given price elasticity for loans, the difference between the loan rate charged and the costs of providing the loan is the higher the lower the number of banks. In this case of identical costs, $1/n$ is the degree of horizontal concentration. Under perfect competition we have $n \to \infty$ or $\varepsilon_{r_L} \to \infty$ so that individual banks do not have the power to raise price above marginal cost. Market power is highest in monopoly (n=1). Condition (3b) implies that the more banks are in the market the higher the deposit rate will be. To compare quantities across market structures we simplify and use the linear functions given by (4a) and (4b).

$$r_L = a - b\sum_{i=1}^{n} L_i \qquad a,\ b > 0;\ a > r + c_L \tag{4a}$$

$$r_D = A + B\sum_{i=1}^{n} D_i \qquad A,\ B > 0;\ A < r\,(1 - \alpha) - c_D \tag{4b}$$

Market Power in the Lending and Deposits Markets (continued)

Using (4a) and (4b) in the first-order conditions for profit maximization and taking into account that identical costs imply $L_i \equiv L$ and $D_i \equiv D$ for all *i* and thus $\sum_{i=1}^{n} L_i = nL$ and $\sum_{i=1}^{n} D_i = nD$, the optimal amounts of loans and deposits are given by (5a) and (5b).

$$nL^* = \frac{n}{n+1}\frac{a-r-c_L}{b} \tag{5a}$$

$$nD^* = \frac{n}{n+1}\frac{r(1-\alpha)-c_D-A}{B} \tag{5b}$$

From (5a) and (5b) it follows that, compared to a perfectly competitive banking industry $(n \to \infty)$, a monopoly bank will grant only half of the loans and demand only half of the deposits. Further, individual supply and demand, $D^* = nD^*/n$ and $L^* = nL^*/n$, decrease when the number of banks increases.

2.2.1 Concentration

In the standard textbook case, firms with monopoly power charge higher prices and produce less than optimal amounts of goods and services. As they enjoy monopoly profits, their incentive to innovate tends to be lower than for firms exposed to competition pressure. Rather firms with market power may operate within the capacity limits of best-practice technologies (X-inefficiency).[4] Further, the exercise of monopoly power in one market distorts the allocation of resources in other markets as well. Capital will not be put to its most productive uses, thus impeding capital accumulation, technological progress and growth.[5]

In the box above, standard industrial organisation theory is applied to the banking industry to show that a bank with market power grants fewer loans at a higher price and offers a lower interest rate on deposits.[6] The individual bank's market power is positively related to the degree of horizontal concentration. However, observing the degree of concentration in banking is not sufficient to infer how aggressively banks compete and whether loan and deposit rates are unduly distorted by the exercise of market power. Horizontal concentration can be the consequence of indivisibilities in the transformation technology. Then a minimum efficient bank size exists and the number of banks viable in the market will be limited. In the extreme, if

[4] See the seminal work of Leibenstein (1966) on X-inefficiency which, in the context of firms, refers to organizational inefficiencies arising from large size and market power.

[5] See Neumann (1997, 1999) for a general equilibrium analysis of the impact of market power on capital accumulation, innovation and long-run growth. See Boone (2001) for a partial equilibrium analysis of the link between the intensity of competition and the incentive to innovate.

[6] Adopted from Feixas and Rochet (1997).

the transformation technology entails substantial indivisibilities only one bank may be viable so that a natural monopoly emerges.

In the presence of indivisibilities marginal cost pricing leads to losses. Therefore, firms need to have some market power and raise price above marginal cost to cover the costs of indivisible inputs. Market power generates economic rents if the firm can sustain a price above average cost in the longer run. Whether market concentration reflects a competition problem or not depends on the ease of entry. Economic profits attract entrants. Scale economies alone do not constitute a barrier to entry. In fact, entry is free if the costs to be incurred upon entry can be fully recouped upon exit, that is, if they are not sunk. The box below shows that, among other factors, entry costs determine the optimal number of banks viable in the free-entry (long-run) equilibrium. An increase in the cost of entry reduces the long-run number of banks and concentrates the market. In the absence of sunk costs however, even a natural monopolist is not able to price above average cost because hit-and-run entrants would steal business and profits. This is an essential insight from the theory of contestable markets as originally advanced by Baumol, Panzar and Willig (1982).

Entry and the Optimal Number of Banks

Entry will take place until economic profits are eroded. Therefore, in the free-entry equilibrium condition (1) must hold

$$\Pi^*(L^*,D^*) = b(L^*)^2 - B(D^*)^2 - f = 0 \qquad (1)$$

where L^* and D^* are the profit maximising quantities as derived in the previous box. Solving for the optimal number of banks yields

$$n^* = \frac{\sqrt{\frac{(a-r-c_L)^2}{b} + \frac{r(1-\alpha)-A-c_D)^2}{B}}}{\sqrt{f}} - 1 \qquad (2)$$

The socially optimal number of banks would be reached when the change in industry gross profits equals the fixed cost of entry. The change in industry gross profits when an additional bank enters is the entrant's profits less the transfer from the incumbent banks to the newcomer. The transfer from each incumbent bank to the newcomer is given by the price-cost margin earned on each unit of production times the reduction in individual production (i.e. dD^*/dn , dL^*/dn). The total transfer is the per-bank transfer times the number of banks. The profits that are transfered from incumbent banks to entrants are just a redistribution of income, not a social gain. This is the well-known "business-stealing effect" (Mankiw and Whinston, 1986) which leads to socially excessive incentives for entry and a welfare gain of entry that is lower than the entrant's anticipated profits.

In other words, wherever investment is sunk, entry and exit is not costless.

2.2.2 Entry and exit barriers

Unrestricted entry may not be beneficial from a social welfare perspective, as it involves a duplication of (long-run) fixed costs. Entrants inflict a negative externality on the incumbents by stealing business from them. With economies of scale an increase in the number of competing banks implies that average costs are raised for all banks, since individual production is reduced. An increase in average cost lowers net total surplus which is the sum of banks' profits and consumer surplus. Thus the social welfare gain of entry is lower than the entrant's anticipated profits. This is the well-known "business-stealing effect" (Mankiw and Whinston, 1986) which leads to socially excessive incentives for entry. The implication is that regulative intervention to restrict the number of active banks (e.g. through entry restrictions, capital requirements, chartering fees) enhances welfare. However, this argumentation ignores two points. First, in situations where only very few players are viable in the market the outcome may be reversed so that insufficient entry results.[7] Second, costs of regulative intervention would have to be assessed.

Entry to the financial sector, in particular to banking and insurance, is regulated in many countries. For example, banks have to be chartered by a regulating authority. In some countries, certain types of banks (e.g. savings banks) may receive preferential treatment in form of explicit or implicit subsidies (e.g., lower refund rates) or public guarantees (e.g., deposit insurance), giving them a cost advantage over other types of banks (e.g. investment banks) or financial intermediaries (e.g., insurance companies) which do not enjoy such protection. A regulatory barrier to entry may exist for foreign competitors if they are subjected to host country regulations. For example, authorisation for doing business may require to set up branch headquarters and branches in the host country.

Contestability hinges on the absence of sunk costs. Entry to the financial sector requires substantial investment which tends to be sunk to a high degree. For example, traditional banking is very much based on physical presence so that a branch network has to be established. Even internet banking where only virtual presence is necessary may involve significant sunk costs because investment in reputation is of utmost importance. As is well-known from the industrial organisation literature on strategic entry deterrence, sunk cost technologies give incumbent firms an cost advantage over potential entrants which can deter entry. Particularly investments in building up customer goodwill and reputation (advertising, developing a client network) may not be reversible upon exit and thus have to be recouped in the market. Irrespective of sunk investments, the presence of economies of scale or scope forces banks to enter with the minimum efficient horizontal, vertical or conglomerate size to be economically viable. For example, an entering specialised bank, such as an investment bank, may have to compete with the investment banking branches of universal banks or financial conglomerates

[7] See Mankiw and Whinston (1986) as well as Perry (1984).

which may use cost advantages from vertical integration and conglomeration to cross-subsidise activities.

Entry barriers, especially in retail banking (directed at households and small firms), may exist because of demand side rigidities. Bundling of financial products and services in a financial "supermarket" gives universal banks or financial conglomerates switching cost advantages if customers prefer "one-stop-shopping" over buying from different specialised service providers. Further, switching banks is made harder and inconvenient by the fact that account numbers and transaction data (e.g. standing orders) can not just be transferred to the new bank. Complexity and differentiation of products and services offered in the financial sector reduce transparency, making direct price and service comparisons more difficult for customers.

Entry barriers also restrict exit. Once you have entered the market sunk investments make it difficult to exit when profit opportunities are vanishing because assets can only be sold off with a loss. Banks may grow so big that they are argued to be “too big to fail”. As will be discussed in detail in the next chapter, failure of a big bank can jeopardize the stability of the financial system. In principle, letting an inefficient player fail is a good thing from a pure efficiency point of view, her productive assets could be bought and used by more efficient players. However, if these assets entail a high degree of sunkness, there will not be an effective and efficient second-hand market for “used” assets. Weak or missing second-hand markets thus enhance the negative externality of big bank failures imposed on the financial system. In this sense, entry barriers become exit barriers, that is, prevent the exit option.

2.2.3 Product differentiation and other non-price strategies

Horizontal concentration increases strategic interdependence. Firms recognise that their profits are affected by the price and quantity decisions of their rivals and that their own decisions impact on rivals' profits. The performance of oligopolistic markets is thus determined by the strategies firms select. In the first place, oligopoly outcomes depend on whether firms behave non-cooperatively, that is, “compete” with each other, or coordinate their activities, that is, “collude”. If oligopolists are able to perfectly collude, they maximise (joint) profits by producing the monopoly output. If non-cooperative behaviour prevails, as assumed above in the Box, firms are the more likely to compete in quantities ("Cournot competition") rather than in price ("Bertrand competition") the more homogenous products and the lower consumers’ switching costs are. In the extreme case of perfectly homogenous products and zero switching costs, the incentive to undercut each other forces Bertrand competitors to price at marginal cost so that there are no profits to be earned. This is the well-known Bertrand paradox. By contrast, the quantity strategy implies above-marginal cost pricing and positive firm profits. While the Bertrand zero profit outcome is not affected by the number of firms, Cournot profits are. Having fewer players in the market, all else equal, translates into a higher price and higher profits but it also makes strategic interaction more relevant. By differentiating products and

services, firms can reduce strategic interaction, increase individual market power and make positive profits. Product differentiation thus solves the Bertrand paradox and reduces the pressure of Cournot competition.

Nonprice strategies, such as investment in new technologies and products (R&D) and strategic advertising, may help shield profitable market segments from entry by tailoring products to the specific needs of individual customers ("customization"). By creating “new” markets firms try to avoid “in-the-market” competition. Instead there may be increased competition “for the market” - an implication that is close to Schumpeterian competition (“creative destruction”).

On the financing side of the firm, the choice of capital structure (debt vs. equity) to finance firm activities can have strategic impact on actual or potential rivals. In concentrated markets leverage can be a commitment device to credibly signal an aggressive reaction to any attempt to steal business (Brander and Lewis, 1986). Hence, the ability to take on more debt can be exploited to reduce output and raise price. Bank activities are to a large extent debt financed.

The power of these nonprice strategies may be elevated through the presence of network effects (e.g. in payment services) which lead to customer lock-ins.

2.2.4 Collusion and multi-market contacts

Collusion among firms leads to higher prices and lower quantities than in the competitive outcome. However, as conspirators have an incentive to cheat on each other to increase individual profit, collusive arrangements tend to be fragile. Collusive outcomes may be more likely to be stabilised when oligopolists compete with each other on multiple markets. Firms behaving aggressively in one market have to reckon with retaliation of their rivals in other markets. In other words, the power to retaliate and punish a defecting or maverick firm can be used in any other market where the respective firms meet, thus promoting parallelism and reducing the incentive to compete head-on in the affected markets. In the financial sector, the recent trend of cross-sector and cross-border expansion increases market contacts among an already small number of big players, raising concerns of softening competition. Further, as discussed above, vertical and lateral integration can give incumbents a crucial cost edge over non-integrated or less integrated rivals, thus making their entry unprofitable.[8]

[8] Edwards (1955, pp. 334) argued that bigness and conglomeration give a firm "a special kind of power ... the length of its purse" so it can "hurt without being hurt". See on this "deep pocket hypothesis" Tirole (1988, pp. 377) and Neumann (2001, ch. 3). For a seminal theoretical analysis of multimarket contacts see Bernheim and Whinston (1990).

Finally, as some recent papers suggest, the Central Bank's (CB) monetary policy can facilitate or impede banks' incentive to collude in the credit market, since the CB monetary strategy influences the banks' cost of raising funds.[9]

2.2.5 Mergers and equity participations among competitors

The best way to guarantee non-aggressive behaviour of rivals is to drive them out of the market or eliminate them through a merger. The immediate result of a horizontal merger is a reduction in the number of actual competitors. The model in the above boxes predicts that, with unchanged cost structures, bank profits increase because the spread between the loan rate and the deposit rate widens. In general, competition authorities are reluctant to allow mergers or acquisitions in concentrated markets. Minority equity participations or cross-shareholdings among competitors can be a subtle way to soften competition without arousing too much suspicion with competition authorities.[10] The market power effect of mergers may be outweighed by a positive efficiency effect if the merger reduces average costs by allowing to exploit scale economies (by spreading fixed costs over a larger base), cut overhead and eliminate duplication costs (by closing redundant branches) or adopt new cost-saving technologies. Mergers between institutions specialized in different market segments may achieve synergies through economies of scope. An increased customer base can be used for cross-selling products and services. Finally, the merger may improve risk diversification (by entering new geographic or product markets). Whether efficiency gains are in fact passed on to customers in lower prices will depend on competitive pressure and entry conditions for potential rivals.

2.3 Empirical evidence

As the theoretical approaches do not give us a clear picture of the overall effects of increased competition in banking, a look into the available empirical evidence is now in order. The bulk of the empirical literature on the financial sector in general and on banking in particular is based on data for the USA. As the organisation of the Anglo-Saxon financial system and the regulation of the financial sector differ substantially from the continental European system, conclusions from the empirical evidence for European banking should be drawn with caution whenever

[9] See Bagliano, Dalmazzo and Marini (2000), Toolsema (2001a). For example, in Bagliano et al. a counter-cyclical monetary policy may facilitate collusive outcomes. If banks price more aggressively during booms because gains of business stealing are larger and retaliation is less likely, an increase of market rates to prevent overheating and inflationary tendencies raises banks' costs of funding. Hence, the gain from being aggressive is reduced, inducing banks to behave more complacently. Of course, the importance of such collusion mechanisms is an empirical question.

[10] See Dietzenbacher, Smid and Volkerink (2000). We analyse such ownership arrangements in Chapter 6 in the context of corporate governance.

European evidence is not available. When we talk about "banks" then European banks are in general universal banks, operating in corporate and retail banking, trading, funds management, securities underwriting etc. Further, they can hold equity interests in insurance companies and non-financial firms. In the USA, by contrast commercial banking was until recently strictly separated from investment banking by law.

2.3.1 Efficiency, scale and scope

Efficient production involves using best-practice technologies and the exploitation of scale and scope advantages. An extensive empirical literature deals with efficiency analysis and the extent of scale and scope economies in banking. The evidence from cost and profit efficiency studies refers almost exclusively to retail banking. The estimates from a large number of studies imply that the average retail bank operates at a cost level of about 10 to 20 per cent above the costs of best-practice banks.[11] Estimates of profit efficiency are somewhat larger, going up to 50 per cent. It has to be borne in mind though that these results sound more robust than they are. Studies often differ substantially in the underlying samples, methodology and measurement so that general conclusions from such comparisons warrant caution.

Although cross-country studies face substantial measurement problems (different regulatory regimes etc.) and comparative results have thus to be assessed with caution, recent cross-country evidence for the European Union implies that efficiency has improved since the implementation of the Single Market due to deregulation and increased competition.[12] Some countries, such as the U.K., the Netherlands or Italy have substantially improved cost efficiency and X-efficiency while other countries, such as France and Germany, are still lagging behind. Efficiency differences exist across and, after controlling for environmental conditions (regulation, banking structure, population), particularly within countries.[13] There is scope for efficiency enhancement by integrating national markets and restructuring institutions at the given bank size rather than by adjusting scale upwards (Sheldon, 2001). This result is consistent with the available evidence that there are no substantial scale economies. Rather the average cost curve seems to flatten out at a size typically already exceeded by larger banks.[14] Efficiency gains from the exploitation of scale economies disappear once a certain size is reached. However, again a caveat is in order.

[11] See Berger and Humphrey (1997) on US banks and Altunbas, Molyneux and Thornton (1997) on European banks.

[12] See Vander Vennet (1996, 2000), Bikker (1999), Casu and Molineux (2000), Sheldon (2001).

[13] See e.g. Wagenvoort and Schure (1999), Dietsch and Lozano-Vivas (2000).

[14] Minimum efficient bank size varies between $100 million and $10 billion dollars of assets, depending on the sample, country and time period analyzed. Similar flat U-shaped cost curves were found for insurance companies and securities firms. See Berger and Humphrey (1997), Berger, Demsetz and Strahan (1997) and Berger, DeYoung, Geany and Udell (2000) for surveys and references.

Most studies do not - or not fully - account for risk differences. As argued by Hughes and Mester (1998), correcting properly for risk differences can bring scale economies to light .

Empirical evidence of significant scope economies between loans and investment activities has not yet been presented.[15] However, this is not to say that such cost-reducing synergies do not exist. Rather measuring scope economies is difficult when the sample of banks does not really include "single-product" (highly specialized) banks against which to benchmark the host of universal banks or financial conglomerates.

Scale and scope economies are frequently discussed as reasons for mergers and acquisitions.[16] A part of the empirical literature thus has looked into the impact of mergers on efficiency and the stock market performance of banks involved in mergers and acquisitions.[17] On the whole, bank mergers both in the US and Europe have not improved cost efficiency significantly.[18] In Europe, where branch banking is common, consolidating mergers could lead to significant cost cuts by closing down redundant branches and reduce personnel. However, with rigid labor markets and unemployment still at high levels this measure is hard to sell in the public. Some studies on US banking find that mergers improved profit efficiency because of better risk diversification of after-merger loan portfolios.[19] The European evidence for the 1980s and early 1990s is mixed, with profitability increases for some good-performer-bad-performer mergers.[20] As the number of European bank mergers has been increasing only very recently, a clearer picture will not emerge before these more recent mergers have been assessed.

The stock market performance of merging banks has been analysed by comparing the market value shortly before and after the merger announcement. An increase in the combined market values of the bidder and the target after the merger announcement is interpreted as creating value for shareholders. In the majority of US studies, an increase in the market value of the target was offset by a loss in the market value of the bidder so that the combined shareholder value was not significantly affected by the merger announcement.[21] Some recent studies do find significant positive wealth effects of bank mergers, especially when mergers are focussed rather than diversifying.[22] In total however, there is little evidence that mergers and acquisitions generate significant shareholder value. For Europe, there is only one study so far. Interestingly,

[15] See Allen and Rai (1996); Lang and Welzel (1998).

[16] See on the efficiency effects of mergers in general, the survey by Roller et al. (2000).

[17] See Amihud and Miller (1999), Berger (2000), Rhoades (1998), Kwan and Eisenbeis (1999).

[18] See e.g. Shaffer (1993), Vander Vennet (1996), Peristiani (1997), Altunbas, Molyneux and Thornton (1997), Berger (1998), Rhoades (1998), Resti (1998).

[19] See Akhavein, Berger and Humphrey (1997).

[20] See Vander Vennet (1996).

[21] See Pilloff and Santomero (1998) for a survey of the US evidence and Cybo-Ottone and Murgia (2000) for Europe.

[22] See Becher (2000), DeLong (2001).

this study finds a significantly positive market reaction for transactions involving commercial banks, combinations with insurance companies as well as domestic and smaller deals.[23]

Summing up, the empirical evidence does not suggest significant gains in cost and profit efficiency or shareholder value from increasing bank size. As Walter (1999, pp. 152) concludes: "Big deals ... and most of the mega-mergers that may appear in the euro-zone in coming years are unlikely, whatever their other merits may be, to contribute very much in terms of scale economies unless the fabled 'economies of superscale' turn out to exist - these, like the abominable snowman, have unfortunately never been observed in nature." Smaller banks may benefit from increasing scale up to a certain size. No straightforward answer can be given regarding the importance of scope economies. However, it has to be kept in mind that the empirical evidence is based on data from the 1980s and 1990s. Recent technological developments in information and communication technology may give rise to new economies of scale and provide the justification for increased merger activity in banking.[24]

2.3.2 The effects of market power and concentration on prices and quantities

A large empirical literature has investigated whether market concentration in the banking industry indeed leads to the misuse of market power. The available evidence both for the USA and Europe supports the hypothesis that market concentration allows banks to earn rents from market power. Banks in concentrated markets tend to have a higher profitability, charge higher rates on loans and offer lower deposit rates.[25] However, for US banks in general only a small percentage of the variability of profitability is explained by market concentration.[26] Further, some studies using more recent data imply that the impact of concentration and market power on prices has weakened.[27] This qualification of the results seems to imply that banking markets have become more competitive, or "contestable", recently due to deregulation and technological advances. New studies do not support such a generalising conclusion but rather suggest that impediments to product market competition and entry still exist, especially in retail banking

[23] See Cybo-Ottone and Murgia (2000) for Europe.

[24] See for this argument e.g. Danthine et al. (1999) and Boot and Schmeits (2000).

[25] See Gilbert (1984), Berger and Hannan (1989, 1998), Hannan (1991, 1997), Hannan and Berger (1991), Hannan and Liang (1993), Berger (1995) for US Banking. See Gual and Neven (1993), Bikker and Groeneveld (2000) and Neven and Röller (1999) on European Banking. Bank concentration was found to raise loan rates in Spain (Fuentes and Sastre, 1998), Switzerland (Egli and Rime, 2000). Positive concentration-price relationships have also been found in US insurance markets (Bajtelsmit and Bouzouita, 1998; Chidambaran, Pugel and Saunders, 1998). See on competition in the European insurance industry OECD (1998a).

[26] See Gilbert (1984) and Berger (1995).

[27] See Hannan (1997), Radecki (1998), Gande, Puri and Saunders (1999) on the US and Corvoisic and Gropp (2000, 2001) on the EU.

preventing a quick erosion of rents which have been created through the adoption of new cost saving technologies and the offering of new revenue generating products and services.[28]

Additional evidence on a lack of contestability in banking comes from mergers studies. One finding is that bank mergers increase loan rates and decrease deposit rates.[29] Another finding is that bank mergers affect small borrowers negatively.[30] There is evidence that competition from alternative sources of finance, most of all capital markets, reduces the market power of banks and leads to lower loan rates and higher volumes of credit for the borrower.[31]
Although there is no hard evidence of tacit collusion in commercial banking, stemming e.g. from increased multi-market contacts, such evidence has been reported for investment banking.[32] The impact of equity participations among actual or potential competitors on prices and profits has been investigated in one study for the Dutch banking sector. The financial institutes' estimated price-cost margins were significantly higher than those implied by theory in the absence of such ownership arrangements.[33]

In sum, there is empirical support for the view that more concentrated banking markets are less competitive. Nonetheless, in drawing conclusions caution is warranted, as the results are based on data from the 1980s and early 1990s. There is no hard evidence yet on how regulatory and technological changes in the late 1990s have affected structure, conduct, performance relationships in the financial sector.

2.3.3 Banking market structure, growth and technological progress

To conclude this brief survey of the empirical literature relating to competition in the financial sector we may take a more macroeconomic perspective and return to theory for a moment. Smith (1998) has explored the effect of banking market structure on macroeconomic performance and welfare. Within the framework of an overlapping generations general equilibrium model with business cycle fluctuations banks are modelled as friction-reducing financial intermediaries in the credit market. Competition among banks is imperfect because bank entry is geographically regulated and there are costs of switching locations for all agents.

[28] See Rhoades (1996, 1997, 1998); Berger, Bonime, Covitz and Hancock (2000), Berger, Bonime, Goldberg and White (2000) as well as Slovin, Sushka and Polonchek (1998) for the USA and de Bandt and Davis (1999, 2000) and Koskenkgla (2000) for Europe. See also Berger, DeYoung and Udell (2000) on efficiency barriers in Europe.
[29] See Prager and Hannan (1999) and Simons and Stavins (1998) for the USA and Egli and Rime (2000) for Switzerland.
[30] See Karceski, Ongena and Smith (2000).
[31] See Pagano, Panetta and Zingales (1998) for respective evidence on Italian firms that went public.
[32] See Pilloff (1999) on US commercial banking and Chen and Ritter (2000) on investment banking.
[33] See Dietzenbacher, Smid and Volkerink (2000). The authors present evidence on AEGON, ING, Fortis, ABN AMRO and Rabobank. The presence of direct and indirect equity participations allowed for price-cost margins that exceed those implied by theory by about 2% assuming Bertrand competition and by about 8% for a Cournot market.

The impact of increased competition on social welfare turns out to be theoretically ambiguous. However, by employing standard macroeconomic performance indicators Smith can unambiguously show that a more competitive banking system has clear macroeconomic benefits. It increases the level of economic activity (income) and reduces the severity of business cycles. His simulation results imply that the quantitative effect on macroeconomic performance of tolerating reduced competition in banking can be large.

Empirical evidence on this predicted banking competition - GDP (growth) link is provided by Cetorelli and Gambera (2001). They investigate the effect of banking market structure differences on growth patterns across 41 countries over the period 1980-1990. One main finding is that "bank concentration promotes the growth of those industrial sectors that are more in need of external finance by facilitating credit access to younger firms." This result is in line with theories of banking that highlight informational asymmetries and the merits of market power for relationship lending.[34] Concentrated banking markets may thus be necessary to raise sufficient funds for investment in certain sectors or for certain groups of firms. However, Cetorelli and Gambera also find "a general depressing effect on growth associated with a concentrated banking industry, which impacts all sectors and all firms indiscriminately." In sum, "there does not seem to be a Pareto-dominant policy regarding the optimal banking market structure: competition in banking does not necessarily dominate monopoly, and vice versa. [...] Banking market structure plays an important role in shaping the cross-industry size distribution within a country. Related to this consideration, since bank concentration plays a more substantial role for growth by facilitating access of younger firms, and to the extent that investment by younger firms is more likely to introduce innovative technologies, regulators face an unexpected trade-off between the generally desirable effects of bank competition and the promotion of technological progress" (Cetorelli and Gambera, 2001, pp. 28). Again, these cross-sectional results should be taken with care. That concentrated banking markets provide small and innovative firms with a better access to risk capital is a claim which lacks sound empirical support so far. As the rise of venture capitalists, seed financiers and other early-stage capital providers suggests, small and innovative firms rather have had a hard time raising risk funds in the traditional banking system.

2.4 Competition policy

Competition policy is concerned with limiting the creation, extension and exploitation of market power. When, in face of substantial indivisibilities in the production technology, market power is necessary to allow for private production, regulation deals with the inefficiencies from the exercise of market power by constraining behaviour (e.g. price caps, access rules) or limiting

[34] We will discuss these theories in chapter 4.

prices (e.g. access pricing). For a long time, banking in many EU countries was exempted from the reach of competition law and subjected to regulation only. As a consequence of deregulation, this is different today. As concerns mergers for example, banks in the EU are fully subjected to EU competition law. In this way, competition policy and regulation interests may become intertwined and be in conflict. We will return to this potential policy trade-off in Chapter 4. For the moment, we focus on competition policy only.

Consolidation in the European banking industry through national and cross-border mergers may very well enhance efficiency by eliminating redundant operations and cutting costs. However, consumer welfare will only increase if banks are forced by competitive pressure to pass on efficiency gains to consumers. Competition can come from the new players as long as they remain independent. Here lies the danger of lateral diversification. If banks are allowed to buy or team up with these new players (strategic allegiances, ownership arrangements) a negative impact on competition not only in the traditional banking sector but also in unrelated product markets is to be expected. Entry into markets in which the key players are either financial conglomerates or non-financial firms controlled by such conglomerates may be effectively impeded if potential entrants must have the same level of vertical integration or lateral diversification as the incumbents to be viable in the market. A lenient attitude of policy makers and competition policy authorities towards national and cross-border bank mergers may pave the way to cartel-like structures in the European financing industry for the years to come.

European competition authorities have recognised the problems of financial institutions merging domestically, cross-sector and cross-border. For example, the merger between Bank Austria and Creditanstalt only got the EU Commission's blessing after Bank Austria divested undertakings which raised particular concerns of reducing competition. Other recent bank mergers went through without raising competition concerns because competition authorities either found a sufficiently high number of competitors and low market shares in the affected markets (e.g. wholesale banking, such as in the UBS merger) or mergers were of a lateral nature, generating complementarities for customers rather than potentially anti-competitive overlaps in activities (e.g. Deutsche Bank and Bankers Trust).

2.5 Concluding remarks

Banking markets deviate from the textbook ideal of perfect competition in a number of ways. Some of these deviations are inherent to the characteristics of banking products. Indivisibilities, asymmetric information and regulatory restrictions on *de novo* entry are all features that can lower competitive pressures but are directly related to the nature of banking. A banking market can be considered "competitive" if banks are freely competing with each other and with new (potential) entrants under these restrictions. The rest of the study aims at finding ways to enhance competitiveness, defined in this way, without endangering stability.

3 Stability in the banking sector

The free banking school favours decentralised and competitive money supply over central banking and also favours removing the government from the monetary system (White, 1999, p. 219). However, in the financial sector competition may work to the detriment of consumers and threaten the stability of the financial system because of inherent market failures. The tendency to market failure arises from agency and informational problems, indivisibilities and externalities. These can be of significant magnitude. Hence the banking sector has been subject to regulation and supervision rather than to market forces and the watchful eye of competition authorities. This chapter investigates the market failures associated with the stability of the financial system, elaborates on the types of banking regulation to deal with the threat of instability and discusses the possible failures of banking regulation.

3.1 Financial stability

Financial stability is the absence of an adverse impact on the real economy from dysfunctions in the financial system (financial institutions and financial markets taken together) or the risk thereof. It comprises of individual and systemic instability. *Individual instability* simply refers to a financial institution failure or a market crash. For example, a *bank failure* can be defined as an unusually large decline in the value of banks' assets that makes the assets' liquidation value smaller than the value of its deposits. In that case, the bank is said to be *insolvent*. Solvency is reflected in the positive net worth of the bank, as measured by the difference between the bank's assets and liabilities excluding capital and reserves. It is difficult to find out whether a bank problem relates to a liquidity problem or a solvency problem, since the specific feature of bank loans is that they are not liquid and their value is private information to the bank that has granted the loan. Even the bank itself may not know the true value of its loans. A *financial market crash* can be defined as an unusually large price fall. In statistical terms this fall can be made more precise by relating it to the extreme percentile of the market's return distribution. For example, a stock market crash can be defined as the case where a stock market index decreases by more than the 1 or 5 percentile of the historical return distribution i.e. the extreme left tail of the distribution (Jansen and De Vries, 1991). *Systemic instability* and *systemic crisis* refer to an event where an individual financial institution failure or market crash leads to *many simultaneous* financial institution failures or market crashes (de Bandt and Hartmann, 2000, p. 10). Notice the difference to contagion. *Contagion* refers to an event where an individual financial institution failure or market crash leads to '*one or more sequential failures* or *crashes*'.[35]

[35] Allen and Gale (2000c) construct a model in which, under certain circumstances, contagion is unavoidable when the economy is subject to a small shock.

Events that cause systemic instability are typically low probability events. Most developed countries have only experienced systemic failures or crashes a few times per century. However, this should not make them less of a concern ex ante since if a systemic failure or crash were to occur, it could have serious social costs that far exceed private costs. *Systemic risk* - the danger of a systemic crisis - is now widely accepted as *the* fundamental underlying concept for the study of instability in the banking sector.

The liquidity and solvency of a bank

This bank is said to be illiquid, but solvent when deposit withdrawals exceed 100 (cash), and is said to be illiquid and insolvent if the final realisable value of all its assets (the liquidation value of its assets) is less than 2850 (deposits). The solvency ratio (with assets unadjusted for risks) of this bank is equal to 200 (capital) / 2950 (loans) = 6.8% and the liquidity ratio is equal to 100 (cash) / 2850 (deposits) = 3.4%.

Assets	Bank		Liabilities
Cash	100	Capital	200
Loans	2950	Deposits	2850
Total	3050	Total	3050

3.2 Market failures in banking

This section discusses market failures that appear in banking markets.[36] Thereby, we focus on market failures that are related to instability in the banking sector. In particular, we discuss asymmetric information, agency problems, indivisibilities and economies of scale and scope and externalities, respectively.

3.2.1 Asymmetric information

Banks are particularly subject to informational asymmetries. On the *liability* side, depositors are confronted with a lack of information on the solvency of their bank. Banks have better information on the true value of their loans than the public. Depositors lack time, experience and capacity to assess a bank's capital and the value of its loan portfolio. Thus depositors do not know the default probability of their bank and the safety of their deposits. In addition, depositors are confronted with the fractional reserve system. Normally, only a small fraction of a bank's assets needs to be held in liquid assets to meet deposit withdrawals. But this fractional reserve

[36] Banks are processors of risk and information.

holding with deposits only partially backed by reserves can lead to illiquidity and even default (insolvency), when exceptionally large withdrawals occur (a run on deposits) following the release of bad information about the banks' assets. Moreover, given that depositors' expectations depend on their place in line at the time of withdrawals because of the first-come, first-served principle (the so-called *sequential service constraint*), a run on deposits can occur even *without* the release of bad information about the banks' assets. If depositors panic, they may try to withdraw their funds out of fear that other depositors will do so first, thus forcing an otherwise sound bank into bankruptcy (Diamond and Dybvig, 1983). Hence, the sequential service constraint creates an *inherent instability in a bank*.

On the *asset* side there exists an informational asymmetry between the bank and its loan applicants. Banks lack information about borrowers and the risk-return characteristics of the projects they wish to undertake. This asymmetric information in the loan market may give rise to adverse selection, moral hazard and ex-post verification problems (Van Damme, 1993, p. 17). *Adverse selection* means that the borrowers who most likely produce an adverse outcome are most likely to be selected, leading to the phenomenon of credit rationing by lenders. *Moral hazard* means that the lender is subject to the hazard that the borrower has incentives to engage in activities that make it less likely that the loan will be paid back. *Ex-post verification* means that borrowers ex post have an incentive to claim that the projects have been less successful than they actually were in order to minimise the dividend pay-out to the lender. All three problems cause borrowers to be unable to raise the capital from lenders, even when the projects they wish to undertake have a positive net present value.

3.2.2 Agency problems

The separation of ownership from control can lead to number of agency problems. Berle and Means (1932) were the first to discuss the problem of the separation of ownership from control.[37] The issues arising are generally discussed under the heading of *corporate governance*. Berle and Means raise doubt as to whether firms would maximise profit for the benefit of shareholders, given the principal-agent problem[38] which exists once salaried managers are running companies owned by numerous dispersed shareholders. This can lead to a number of moral hazard problems. Managers may work less and take more perquisites (they may even steal

[37] Issuing equity or risky debt to outsiders leads to the separation of ownership from control. This problem does not exist if the firm is financed with safe debt.

[38] The standard principal-agent framework assumes that a manager (the agent) makes the day-to-day operating decisions of the firm and the firm is (at least partially) funded by a group of outside investors (the principals).

shareholder money) that may be at the expense of shareholder value.[39] In other words, managers may pursue their own objectives rather than those of the shareholders who appointed them. In the US and the UK the directors of a company have a fiduciary duty to shareholders.[40] Most countries' corporate law will have severe penalties for theft by management. However, taking perquisites or private benefits is harder to constrain. Managers may also be empire builders. They have incentives to expand their firms beyond the optimal size. In particular, managers strategically invest in size expansion, since growth (as measured by sales, market share or employment) increases the managers' power by increasing the resources under their control. If companies manage to generate free cash flow (cash flow in excess of that required to fund all projects that have positive net present values) managers may undertake negative net present value projects rather than pay out the free cash flow to shareholders (Jensen, 1986).

3.2.3 Indivisibilities and economies of scale and scope

The transformation of savings into loans by banks is subject to *indivisibilities*. Without such indivisibilities savers and borrowers could accomplish the transformation of financial contracts into financial securities by themselves. Clearly, collecting savings and monitoring borrowers professionally and regularly involves organisational fixed costs, implying that the per-unit cost of intermediation can be reduced by increasing the volume of transactions, at least up to a certain level. These *scale economies* make banks more efficient than individual investors. Further, the duplication of monitoring costs is reduced.[41] Scale economies also result from operating the payment system. Through devices such as checks, regular transfers, or direct-debit mandates, banks allow customers to carry out money-based transactions easily. With a functioning payment system in place, market participants can, for example, accept checks without having to verify for each transaction the solvency of the issuer which would be very costly indeed. This verification is carried out by financial intermediaries.[42]

[39] Shleifer and Vishny (1997) pose the question as follows: how do the suppliers of finance get managers to return some of the profits to them? How do they make sure that managers not steal the capital they supply or invest it in bad projects? Berglof (1997) argues that competition in factor and output markets will to some extent mitigate the agency problem, but in itself competition is insufficient; market signals are generated after funds have been committed. The role of corporate governance is to ensure that these signals and other relevant information are actually translated into investment decisions: for example by replacing management following poor performance or closing down unprofitable units. According to Berglof, competition and corporate governance are also likely to be substitutes, in the sense that when competitive signals are strong the relative importance of corporate governance is less, and vice versa.

[40] See Mayer (1990) for a comparison of the Anglo-Saxon with the German and Japanese model of corporate governance.

[41] See Diamond (1984) for a seminal theoretical discussion.

[42] A financial intermediary buys and sells financial assets at the same time. It fulfils two functions: brokerage (matching transactions) and qualitative asset transformation (risk management and the transformation of the nature of claims).

The joint provision of deposit and credit activities can produce important *economies of scope*.[43] For both credit and deposit activities banks need to hold large volumes of liquid assets (cash and securities) on their balance sheets. Synergies can arise if lending and deposit withdrawals are imperfectly correlated. Any deadweight costs of holding the liquid assets can then be shared between the two activities.[44] Thus, a "universal" bank can be more efficient than two separate banks specialized on deposits and loans, respectively.

Scale and scope economies can also originate from risk diversification. Larger size and scope allow for better risk diversification. Asset diversification narrows the risk gap between an investor's portfolio and the market portfolio, thus helping reduce the variability of the returns to bank's claimholders. This is beneficial because claimholders tend to be risk-averse and bankruptcy is costly. By making risk diversification their daily business banks can create cost advantages over individual investors. In particular, by being active in the markets for financial futures and options banks have participation cost advantages in risk trading.[45] However, with indivisible assets a *minimum bank size* will be necessary to benefit from diversification.

3.2.4 Externalities

The mismatch in maturities between liabilities and assets causes systemic problems. As the information about banks' loan portfolios is private information, depositors may be unable to distinguish between good and bad banks. If depositors cannot fully observe and assess a bank's risk profile, excessive risk taking is not internalized in the sense that higher-risk banks have to pay higher risk premia. In this way, individual risk taking imposes an *externality* on all other banks. If the quality of a bank's lending book deteriorates because loans are not being repaid on a larger scale, depositors may get worried about the safety of their deposits and "run on the bank" to withdraw their savings. Herd behaviour by depositors thus can drive the bank into insolvency and failure. A bank run can be "contagious" and spread to other, healthy banks, especially when these banks are linked to the failing institution through interlocking claims (e.g. via clearing-houses and correspondent deposits). Because of this disruptive force of contagion bank failures may have much more serious repercussions (high deadweight costs) for the economy than large-scale failures of nonbank firms.

3.3 What triggers financial instability?

Financial instability encompasses three important elements: shocks, propagation and impact (de Bandt and Hartmann, 2000). Shocks can either be idiosyncratic or systematic. *Idiosyncratic*

[43] With economies of scope, the cost of producing different goods are interdependent. Producing one good reduces the cost of producing another.

[44] See Kashyap, Rajan and Stein (1999).

[45] See Allen and Santomero (1997).

shocks are those which, initially, affect only the health of a single financial institution or only the price of a single asset, while *systematic* shocks affect the health of a number of financial institutions or the prices of a number of financial markets at the same time. Idiosyncratic shocks are insurable in the sense that an investor can protect herself against them via diversification, whereas systematic shocks are uninsurable or non-diversifiable. Between these two extremes there is a continuum of intermediate shocks. The second element is the mechanism through which shocks *propagate* from one financial institution or market to the other. This propagation of shocks may occur through a number of channels, e.g. payments systems, security settlement systems, inter-bank markets, credit flows and asset markets. The third element is the *impact* of shocks. Failures and crashes generate negative externalities in the form of private and social losses.

3.3.1 Sources of shocks

Banks may be hit by real and financial shocks. A shock is a rapid course of events leading to large (more than normal) private and social losses. We start with a review of some potential sources of shocks (see e.g. Mayer, 1999 and CSFI, 2000).

Macroeconomic policy changes

Abrupt *monetary policy changes* such as sharp interest rate rises following a reduction in the supply of money may precipitate problems at banks. Increases in interest rates reduce asset quality. As demonstrated by Stiglitz and Weiss (1981), if market interest rates increase, there is a higher probability that the lender is lending to a bad credit risk. If the lender cannot discriminate among the borrowers with the riskier investment, it may want to make fewer loans (asymmetric information that results in adverse selection). Some borrowers are denied loans even when they are willing to pay a higher interest rate. This causes the supply of loans to decrease (*credit rationing*), leading to a decline in investment and aggregate economic activity.[46] For example, the contractionary monetary policy in the late 1970s sparked the US Savings and Loans (S&L) crisis. In EMU, without the tool of monetary policy at the national level, there is increased macroeconomic risk at that level. *Competition* in the banking sector and *disintermediation* put banks under pressure. McCauley and White (1997) argue that bond markets in EMU may gain in strength, depth and liquidity and this will be to the disadvantage of banks that supply traditional intermediated credit. The risks of ongoing excess capacity in the European banking industry should not be underestimated (ECB, 1999a, 2000b). Competition

[46] Stiglitz and Weiss (1981), however, make the very strong assumption of the same expected returns per project. De Meza and Webb (1987, 2000) take the opposite view and assume that the expected return varies per project. As the risk of the project increases, the return in the event of success is higher, but the probability of success decreases, eventually by so much that the expected return decreases. The authors show that when funding is denied to potential entrepreneurs due to asymmetric information, it does not follow that there is too little lending.

is increasing but this has not yet eliminated the overcapacity in banking. Under perfect competition the less efficient banks are driven out of the market until the surviving banks are equally efficient. *Internet banking* could make the excess banking capacity in many countries increasingly a problem (ECB, 1999b). The Internet makes it possible to offer pan-European retail services at low costs. *Mergers and consolidations* have created more institutions that are too-big-to-fail. Finally, the trend towards *conglomeration* complicates tasks of supervision and regulation.

The collapse of asset prices

A major threat to financial stability is the *deviation of asset prices away from their fundamental value.* Examples are the property and equity price bubbles that developed in Scandinavia and Japan during the 1980s. More recently, we had the "bubble" in technology, telecom and Internet stocks. Property and equity prices may affect the economy via private sector wealth. The wealth effect of lower asset prices reduces consumption. Property and share prices may also affect the economy via households', firms' or banks' balance sheets. The balance-sheet channel arises from the problem of asymmetric information in the credit market. Asymmetric information gives rise to adverse selection and moral hazard problems. The lower the net worth of firms and households, the more severe these problems will be, since there will be less collateral available to secure bank loans. Collateral reduces the consequences of adverse selection or moral hazard because it reduces the bank's losses in the case of default. If the borrower defaults the bank can sell the collateral to make up for the losses on the loan. Firms and households may be tempted to take greater risk if collateral values drop, since they have nothing to lose (gamble for resurrection). As a result banks may be faced with irrecoverable loans. A rise in asset prices raises the borrowing capacity of firms and households by increasing the value of collateral. The additionally available credit can be used to purchase goods and services and thus stimulates economic activity. The process can be self-reinforcing, since part of the additionally available credit may also be used to purchase assets, pushing up asset prices even further, what will again increase the creditworthiness of borrowers, and so on.[47] Alternatively, owing to the increase in the market value of houses relative to their replacement value, investment in new houses increases. A similar reasoning holds for the investment in new equipment by firms.

[47] A number of common factors underlie the asset price bubbles in Scandinavia and Japan (see IMF Economic Outlook of October 1992, and the OECD Economic Outlook of November 1992). Financial deregulation and liberalisation improved access to credit markets by households and firms, and led to market-determined remuneration of deposits and market-determined allocation of resources. Against this background monetary policy underestimated the degree of stimulus that came from the freeing of credit markets, partly because monetary aggregates became less reliable indicators of inflationary pressure and partly because of disintermediation. Prudential policy also did not adapt quickly enough in some countries to prevent a lowering of credit standards.

The interaction of credit and asset prices has been put forward by Fisher (1933) in his *debt-deflation theory* to explain the Great Depression. The interaction of credit and asset prices was re-emphasised amongst others by Bernanke and Gertler (1989), Kiyotaki and Moore (1997) and Bernanke, Gertler and Gilchrist (1998). These models show how the interaction between credit and asset prices transmits shocks to the economy. This effect is referred to as the *"financial accelerator effect"*. Once banks experience a deterioration in their balance sheets following an equity or property crash, it is very hard for them to raise new capital at a reasonable cost. Thus a typical response of banks with weakened balance sheets is to reduce lending. A severe deterioration of banks' balance sheets may involve a *credit crunch* in the sense that even creditworthy borrowers are denied credit. Except maybe for the US, where equity secured borrowing also plays a role, loans are more generally secured by property. Therefore, property prices would be expected to be by far more important for the balance sheet channel than equity prices (CSFB, 2000b). Since property prices are far less positively correlated than equity prices, property price collapses in first instance are more associated with systematic shocks to banks within a single country, whereas equity price collapses are more associated with systematic shocks to banks in several countries.[48]

Allen and Gale (2000d) consider positive and negative asset price bubbles and their *relationship to monetary policy*. Positive bubbles occur when there is an agency problem between banks and the people they lend money to because the banks cannot observe how the funds are invested. This causes a risk shifting problem and asset prices are bid up above their fundamental. The greater is uncertainty concerning monetary policy and the amount of aggregate credit the greater is the bubble. Negative bubbles can occur when there is a banking crisis that forces banks to simultaneously liquidate assets. Asset prices fall below their fundamental because of a lack of liquidity. If the central bank provides a monetary injection this negative bubble can be prevented.

Problems within a bank

The failure to repay a loan (*credit risks*) is still the most likely cause of banking problems. Also *operational failures* may cause individual banks to fail. Operational failures may result from inadequate or failed internal processes, people and systems. For example, the collapse of Barings Bank in 1995 was due to one employee concealing trading losses amounting to 1.4 billion British pounds. Large exposures of banks to hedge funds, the telecom industry or countries may also pose a problem. For example, UBS lost about $700 million due to its (double) exposure to LTCM in 1998. Although, some financial institutions are heavily involved in the derivatives markets, the losses on derivatives' portfolios so far do not seem to have resulted in major social

[48] Note that investor herding behaviour (e.g. via tracker funds) may amplify shocks to asset markets. On herd behaviour see Banerjee (1992).

losses. Derivatives *always* have two sides, a long and a short (Garber, 1998a). The gains and losses thus simply represent transfers of wealth between counterparties, not changes in aggregate net wealth. Still, private losses due to over-the-counter derivatives mispricing such as for example at Deutsche Bank ($720 million in 1996) or UBS ($600 million in 1997) have the potential to result in major social losses.

Uncertainty

Uncertainty is a key feature of instability that helps to explain disproportionate responses of financial markets. A dramatic increase in uncertainty in financial markets makes it harder for lenders to *screen out* good from bad credits, leading to credit rationing, and output losses. Uncertainty makes information even more asymmetric (Mishkin, 1997). *Trust* that market institutions are in place and that commitments made today by market participants will be honoured not only tomorrow, but for years into the future are important for the functioning of the financial system. The greater the degree of confidence in the state of future markets, the greater the level of long-term investment. The terrorist attack on the US of September 11, which markedly raised the degree of uncertainty about the future, has the potential to result, for a time, in a pronounced disengagement from future commitments. And that, in the short run, would imply a lessened current level of activity.

3.3.2 The propagation of shocks

The banking sector and the linkages by which it is connected to the rest of the financial system play a central role in the propagation of shocks. This propagation of shocks may occur through a number of channels, e.g. payments systems, security settlement systems[49], interbank markets, credit flows and asset markets (de Bandt and Hartmann, 2000). For instance, inter-bank markets are considered to be an important transmitter of systemic shocks between banks (Favero et al., 2000). A bank with urgent demand for liquidity will try to liquidate its most marketable assets, i.e. inter-bank loans. If a (large) bank runs into trouble then, selling off its assets could have a snowball effect. The failure of one bank can cause immediate losses to other interconnected banks. Because of the increase in the volumes of the inter-bank markets, already medium-sized banks could in some cases become systemically significant.

The propagation of shocks may also be through asset prices. The collapse of asset prices may lead to a sudden *drying up of market liquidity*. Nowadays various techniques used in securities

[49] The growth in size of payments and securities settlement systems have raised the potential costs should a number of financial institutions fail. Payment and securities settlement systems determine to a large extent the exposures among financial institutions, because they provide the technical infrastructure through which market transactions are settled (G10 Report on Financial Sector Consolidation, 2001).

and derivatives markets such as margin requirements[50], warehousing[51] and dynamic hedging[52] can account for large and immediate need of liquidity by banks ex post, at times of large asset price falls (de Bandt and Hartmann, 2000). A drawing down of back-up credit lines by bank customers (e.g. telecom firms) shut out from the capital market may lead to liquidity shortages at banks. Banks may also have large *proprietary trading positions* in stock and bond markets, and so may directly be affected by the price risk in stock and bond markets. Many banks also derive income from *securities underwriting*. Universal banks carry out an important share of securities business in Europe. If equity and bond prices would fall banks must take losses on their investment portfolios while issuing activity drops sharply.

3.3.3 The impact of shocks

To be useful for policymakers, financial instability needs to be cast in terms of expected losses, that is, the probability of a loss times the size of the loss arising from the shock over a certain time horizon that might have been avoided had regulation been in place, rather than as a statement of the size of past losses. Policymakers care about the stability of banks for both systemic and prudential reasons. *Systemic* reasons arise if the social costs of the failure of a bank exceed the private costs. Potential social costs from bank failures include losses to holders of deposits, no access to credit by borrowers, disruption of the payments system, unemployment, output reductions, loss of confidence in other banks and costs to tax payers, whereas private losses include losses to bank clients and shareholders only.[53] *Prudential* reasons arise because consumers lose when a bank fails, even if there are no systemic consequences.

Measuring the costs imposed by banking crises (a wave of bank failures) on the economy as a whole is not straightforward. Hoggarth and Saporta (2001) present cross-country estimates of the direct fiscal costs of crisis resolution associated with 24 banking crises. In table 3.1 a distinction has been made between banking crises alone and those which occurred in conjunction with a currency crisis (so-called "twin" crises). A currency crises is defined as nominal depreciation in the domestic currency (against the US dollar) of 25 per cent combined with a 10 percent increase in the rate of depreciation in any year of the banking crisis period. Fiscal costs reflect the various types of expenditure involved in rehabilitating the financial system, including both bank recapitalisation and payments made to depositors, either implicitly

[50] For example in futures markets, counterparties can accumulate large losses over time due a combination of unfavourable market prices that lead to margin calls and a potentially long time between entering into the futures contract and the delivery month.

[51] The swap dealer of a bank enters into a swap with a counterparty and immediately hedges the swap risk until a counterparty wanting to take an opposite position is found.

[52] A procedure for hedging an option position held in the underlying assets.

[53] The problem of the way in which financial losses impact on the real sector (the transmission of financial losses) is largely beyond the scope of this study.

or explicitly through government-backed deposit insurance schemes. The data in Table 3.1 show fiscal costs to be particularly high when banking crises are accompanied by currency crises.

Table 3.1 Average cumulative fiscal costs of banking crises in 24 crises, 1977-2000

	Number of crises	Non-performing loans (percentage of total loans)	Fiscal costs of banking resolution (percentage of GDP)
All countries	24	22	16
Emerging market countries	17	28	17.5
Developed countries	7	13.5	12
Banking crisis alone	9	18	4.5
Banking and currency crises of which	15	26	23
Emerging market countries	11	30	25
Developed countries	4	18	16
Banking and currency crises with previous fixed exchange rate of which	11	26	27.5
Emerging market countries	8	30	32
Developed countries	3	18	16

Source: Hoggart and Saporta (2001, p. 150).

The average fiscal costs for a twin crisis is 23 per cent of annual GDP compared with "only" 4.5 per cent for a banking crises alone. Moreover, all countries that had fiscal costs of more than ten per cent of annual GDP had an accompanying currency crisis. The cumulative fiscal costs of banking crises appear to be larger in emerging economies (on average 17.5 per cent of annual GDP) than in developed economies (12 per cent). For example, Indonesia and Thailand have already faced resolution costs - 50 per cent and more than 40 per cent respectively of annual GDP - whereas, in the Nordic countries in the early 1990s cumulative fiscal costs were kept down to 11 per cent of annual GDP (Hoggarth and Saporta, 2001, p. 151). The difference may be because developed countries face smaller shocks to their banking systems. Some data suggest that non-performing loans have been proportionally much larger in emerging market banking sectors (see Table 3.1). Alternatively, both the banking sectors and the real economy may have been better able to withstand a given shock because of more robust banking and regulatory systems, including better provisioning policies, deposit insurance and capital adequacy practices. Thus, the *recuperative power* of the financial system and the economy is not unimportant. That is, how long does it take for the financial system and the economy to be back to normal? The difference in these fiscal costs may also reflect the greater importance of state banks within emerging markets, since they are more likely than private banks to be bailed out by governments when they fail. As one might expect, everything else equal, fiscal costs of banking resolution seem to be larger in countries where bank intermediation - proxied by bank loans to total financial assets - is higher (see Table 3.2). For example, during the S&L crisis in the US in the

1980s, where intermediation by financial institutions is relatively low by the standards of developed countries, fiscal costs were estimated at "only" 3 per cent of annual output. In contrast, in Japan, where bank intermediation is relatively important, the resolution costs were estimated at 8 per cent of GDP by March 2001 and with the current stabilisation package might rise as high as 17 per cent of GDP.

Table 3.2 Comparison of the size of bank loans versus bonds and equities (percent of total financial assets, 1990, 1995 and 1999)

	1990			1995			1999		
	Equity	Bond	Loan	Equity	Bond	Loan	Equity	Bond	Loan
United States	27.1	53.8	19.1	36.3	49.5	24.2	47.9	42.0	10.1
EMU							23.9	29.2	46.9
France	15.1	27.6	57.3	17.1	35.3	47.6			
Germany	1.8	10.0	88.2	2.1	11.0	86.9			
Italy	9.3	47.7	43.0	10.5	55.4	34.1			
Japan	33.4	29.8	36.8	27.6	37.3	35.2	21.0	42.5	36.5

Source: Merrill Lynch (2000, p. 16).

Fiscal costs incurred almost certainly depend on how crises are resolved. Poor resolution might be expected to be reflected in crises lasting longer and/or becoming increasingly severe. In the meantime some fragile banks could 'gamble for resurrection' and thus eventually require more restructuring than would otherwise be the case.

Resolution costs may not always be a good measure of the costs of crises to the economy more generally. Large fiscal costs may be incurred to forestall a banking crisis or, at least, limit its effect. In this case, the overall costs to the economy at large may be small, and if the crisis were avoided would not be observed, but significant fiscal costs might have been incurred (Hoggarth and Saporta, 2001, p. 152). It may simply entail a transfer of income from current and future taxpayers to bank stakeholders (shareholders, depositors, creditors and borrowers of banks). Conversely, the government may incur only small costs, and yet the broader economic adverse effects of a banking crisis could be severe. For example, a banking crisis was an important feature of the Great Depression of 1929-1933 and yet fiscal costs were negligible since there was little capital support for the failing banks and no deposit insurance. But the instability of the financial system directly affected the consumption and production side of the economy and, consequently, economic growth and development.[54]

[54] See the seminal studies of Gurley and Shaw (1960) and Goldsmith (1969). Gertler (1988) and Levine (1997) provide useful overviews. See King and Levine (1993a,b), Levine and Zervos (1998), Demirgüç-Kunt and Maksimovic (1998), Beck, Levine, and Loayza (2000), Levine, Loayza, and Beck, (2000), Wurgler (2000) for more recent empirical evidence on the link between finance and growth at various levels of data aggregation.

Cross-country comparisons of broader welfare losses to the economy associated with banking crisis are usually proxied by losses in GDP. Output losses are either measured as the cumulative difference between trend and actual *growth* during the crisis, or as the cumulative difference between the *levels* of actual output and its past trend. Estimates of these losses are reported in table 3.3.

Table 3.3 Average mean cumulative output losses (per cent of GDP) in 43 banking crises on different assumptions

Definition of end crisis	Output levels	Output growth rates
All countries		
Ten years	16.9	8.7
Three years	16.3	14.5
Low-medium income		
Ten years	13.9	8.3
Three years	13.9	14.9
High income		
Ten years	23.8	9.5
Three years	21.9	13.4
Twin crises		
Ten years	29.9	13.0
Three years	29.0	23.1
Single banking crises		
Ten years	5.6	4.9
Three years	5.3	7.1

Source: Hoggarth and Saporta (2001, p. 156)

Although, varying markedly, cumulative output losses during banking crisis have, on average, been large - around 15 to 20 per cent of GDP.

3.4 Regulation

Policymakers around the globe see it as a major public task to stabilize the financial system.[55] Firm failures are an important corrective for economic inefficiency but in banking they can be disruptive. If customers' funds are not fully backed by liquid assets or by some form of insurance, there is only one way depositors can retrieve their money from the bank's vault in case of actual or rumoured failure: Be among the first to run on the failing bank and withdraw all your funds immediately. The failure of one bank can cause a contagious loss of confidence elsewhere. The adverse consequences to the system as a whole may by far exceed those of the

[55] See e.g. von Hayek (1978), Selgin (1988, 1996), or Dowd (1992, 1993, 1996, 1999) for stout dissent on public intervention.

initial failure.[56] To prevent propagation banks are subjected to regulation and supervision through public authorities.[57]

Economies deal with financial stability issues by means of regulation. Prudential and systemic regulation is primarily directed at controlling the levels of risk assumed by banks and thus the probability of failure. Indirectly, it concerns the capacity of the financial system to handle bank failures. Prudential and systemic regulatory instruments include admissible lines of business and portfolio restrictions, lender of last resort, capital requirements, liquidity and reserve requirements, large exposure rules, internal risk management and entry, exit, branching, network, and merger restrictions (see chapter 2). Conduct-of-business regulations primarily aim at the protection of bank customers (borrowers and lenders). Conduct-of-business regulations include deposit insurance and disclosure requirements. Note that the particular form of regulation and the intensity of regulations vary considerably from country to country. It is not the purpose of this section to give a country-by-country description and comparison of regulation.

3.4.1 Admissible lines of business and portfolio restrictions

In the USA, the Glass-Steagall Act of 1933 until recently forbade commercial banks to engage in investment banking and to hold corporate equity for their own account, leaving the underwriting of securities to investment banks. The restrictions on investment banking stemmed from the 1929 stock market crash and the perceived role of banks in the market's collapse. According to Freixas and Rochet (1997, p. 265), the main arguments in favour of separating commercial and investment banking were (1) that the holding of equity of firms by banks may increase their risk exposure and (2) that there is a potential conflict of interest. The first argument is obvious. Restrictions on equity investments reduce the level of risk that banks can take (equity is more risky than debt) and thus the probability of bank failure. The potential conflict of interest is due to the fact that banks having lent to firms in financial distress may be willing to underwrite these firms' poor securities to pay off the loans they hold which is to the detriment of depositors. The imposition of admissible lines of business and portfolio restrictions may create artificial markets or restrict innovation. The *Institute of International Bankers* (2000) provides the most recent information on admissible lines of business and portfolio restrictions.

[56] Total costs of a banking crisis involve the transfer costs of resolving the crisis and the welfare loss reflected in GNP reductions. Etsimates of total losses in country-specific banking crises range from 10 per cent of GNP (Japan, 1990s) to almost 60 per cent (Argentina, 1980-82). See Crockett (1997, p. 13, Table 2).

[57] See e.g. Spong (1992, 2000), Dewatripont and Tirole (1994), Crockett (1996) or Goodhart et al. (1998), Hubbard (2000, ch. 14, 15) for introductions.

3.4.2 Lender of last resort

The central bank acts as a lender of last resort (LOLR) and provides banks with liquidity during a crisis. In this way, it alleviates temporary liquidity shortages and prevents a liquidity problem from becoming a solvency problem.[58]

3.4.3 Deposit insurance

The government can also give explicit or implicit guarantees to fully or partially cover deposits in case of a bank failure. Insurance of deposits is a measure to protect depositors from losses and reduce the vulnerability of banks by keeping depositors from running on banks.[59] Under a deposit insurance scheme the bank pays a premium to a deposit insurance company.[60]

3.4.4 Capital requirements

The main form of regulation today is directed at the capitalization or equity capital of banks. As spelled out by the Basle Committee on Banking Supervision, banks are required to hold adequate capital against the risks they run. Recently, these requirements have been fine-tuned to improve risk assessment (e.g. credit risk, operational risk). A bank's net worth or equity capital is the difference between assets and liabilities, that is, the sum of the capital contributed by the bank's owners (shareholders) and the accumulated, retained profits. It determines the bank's value after all liabilities have been met and provides a buffer against a decline in the value of assets. The higher is a bank's net worth the more her owners have to lose in risky ventures. But the ratio of capital to assets is much lower in banking than in other businesses. By comparison with commercial and industrial firms, typical capital to assets ratios lie between 4 and 8% in the banking sector, as compared to 30 to 40% in industry and commerce. Because of this, a high level of indebtedness banks need to be more strictly regulated than other businesses. The high gearing (high debt-equity ratio,) of banks directly follows from their role as financial intermediaries in combination with their fractional reserve holdings. Banks transform short-term liabilities (deposits) into longer-term assets (loans). Investors typically wish to have access to funds at short notice, while borrowers typically wish to borrow funds over longer-term horizons. In other words, investors usually require a high degree of liquidity. To perform this liquidity function a bank will have to operate with a fragile capital structure (high debt ratios) almost by necessity which makes it vulnerable to bank runs. Banks' high gearing exacerbates the risk shifting (asset substitution) problem. To explain, let us follow Jensen and Meckling (1976) who examine the possibility of a conflict of interest between shareholders and bondholders. Jensen and Meckling assume that the firm is run in shareholders' interest. Risky debt may

[58] It is not the purpose of this study to analyse further whether, when and how lender-of-last-resort support should be carried out.

[59] See Lee and Kwok (2000) for an international comparison of deposit insurance schemes.

[60] Note that moral hazard problems associated with a safety net are discussed in section 3.5.

create problems of conflict of interest between shareholders and bondholders. Shareholders may not sanction positive net present value projects if there is an overhang of risky debt (Myers, 1977). In that case, shareholders may be biased to riskier investments. In banks there is no conflict of interest between managers and shareholders because increased debt raises the value of equity. As debt holders (mainly depositors) bear almost all of the downside risk, bank managers have an incentive to make more risky loans in order to create shareholder value. Shareholders fully participate in the upside potential while bearing only a small portion of the downside risk. Therefore, setting minimum capital requirements is a regulatory measure to reduce moral hazard and the incentive of excesisve risk taking. Furthermore, capital requirements also intend to reduce the systemic failure probability and add security to depositors and the deposit insurance system.

3.4.5 Liquidity and reserve requirements

Banks may also face *liquidity requirements* to reduce the likelihood of liquidity shortages following deposit withdrawals. The liquidity of a bank is its ability to meet the demand for cash within a couple of business days. The demand for cash is met by the bank's holdings of cash, short-term, marketable assets plus unused borrowing capacity. In general, the shorter the maturity of a banks' liabilities, the greater the need for liquidity. The central bank may also require banks to hold *reserves* in the form of cash and balances at the central bank[61] to control the money supply/interest rate.

3.4.6 Large exposure rules

Safeguarding against excessive *risk exposures* to firms, sectors, or countries is an important concern of regulators. Depositor confidence and thus the stability of the banking system are closely tied to the quality and liquidity of the banks' assets. A large exposure to a firm, sector or country can make a bank vulnerable (particularly when exposures exceed bank's capital) should there be problems with that particular firm, sector or country. The conventional regulatory approach is to limit exposures to a certain percentage of the bank's capital base. Risk exposure may also apply to other aspects of a bank's business than its assets, e.g. to *collateral*, if a high proportion of loans are made against the same type of collateral. Large exposure rules may reduce the efficiency of intermediation when it increases unit costs.

3.4.7 Disclosure requirements

Minimising the adverse selection and moral hazard problem of banks requires production and reporting of information. The government can help by imposing regulations on banks that

[61] The term reserves should not be confused with the term loan-loss reserves, a part of bank's capital that is set aside to cover bad loans.

encourage information disclosure. Adequate disclosure of information should act as a deterrent to excessive risk-taking since it enables the market to discipline the bank.[62] For example, banks need to provide their customers with meaningful disclosure of deposit and credit contract terms. The main intent behind such disclosures is to give customers a basis for comparison and informed choice from different institutions and financial instruments. The disclosure also acts to protect borrowers from abusive practices and make them more aware of the costs and commitments in financial contracts. Disclosure of information also serves equal treatment and equal access to credit.

3.4.8 Internal risk management

Until recently, regulation was primarily externally imposed upon the regulated. However, the increasing complexity of operations and the speed of portfolio adjustments make this form of regulation less satisfactory. This raises the question of how to shift from external regulation (prescriptive and detailed rules) to *internal self-regulation*, reinforced by appropriate incentive structures for managers (see Goodhart et al., 1998). Regulators are increasingly concerned with the banks' internal organisation of risk-management. Internal managerial control becomes the first, and the most important, protection against imprudent or improper actions and positions. Regulators use periodic examinations to collect on-site information on the banks' loan quality and on the adequacy of banks' internal credit and market risk models. These examinations are intended to find out more about the current financial condition of a bank and its compliance with regulations. In addition, regulators look at bank's overall integrity policy and how it deals with insider trading, tax offences, money laundering, risk reporting, salary and bonus schemes.[63] On-site visits and authorisation reduce the information asymmetry between the regulator and the bank and they contribute to making bank management more aware of their responsibility for possible losses. On the one hand, these authorisation requirements for banks' internal models may be detrimental for competition because they may create entry barriers for smaller banks. Such banks may have fewer resources to set up and afford sophisticated internal models. On the other hand, the recognition of the superior risk management capabilities of internal models may also be beneficial for competition since they level the playing field with respect to risk imposed on others.

[62] We should recognise that the market and clients may be pretty good at judging, and disciplining, relative risk, they are less good at assessing the systematic risk associated with the economic cycle. Market discipline, in other words may be necessary, but not sufficient to avoid instability.

[63] For example, the design of compensation schemes of banks' employees (fixed salary plus bonuses based on performance) should be such that excessive risk-taking is prevented, otherwise traders and managers might be risk-seeking in order to maximise bonuses.

3.5 Regulatory failures

With very strict regulations in place, it may be possible to reduce the probability of bank failure(s) to very low levels. However, it is likely that this would reduce the efficiency of financial intermediation (impose costs on the bank's customers) and impede innovation, and, ultimately, the performance of the economy. In this context, it is important to keep in mind that there are costs attached to regulations, both directly (salaries of supervisors, administrative costs at banks) and indirectly (through distortions it generates to the normal functioning of the financial system[64]) which are ultimately reflected in the price of financial services (Freixas and Rochet, 1997, p. 258). Thus, even if a regulation is judged to have a beneficial effect, it is important also to investigate its costs and weigh these against the associated benefits. In this connection, Goodhart et al. (1998, p. 4) argue that the case for government intervention depends on the circumstances in which the private sector, left to itself, produces market failures which are arguably worse than public sector regulation, even with all the biases and failings that such regulation may entail.

3.5.1 Moral hazard and the too-big-to-fail problem

While the role of a central bank as LOLR is uncontroversial[65], deposit insurance has come under heavy attack lately as a paternalistic rather than economically justified or justifiable goal.[66] The snag of deposit insurance is that it creates moral hazard and encourages banks to take excessive risks. Without insurance, banks are on their own, knowing that their decisions and activities will be monitored by the banks' claimholders. As their money is at stake, claimholders, especially savers with large deposits, have an incentive to monitor. With insurance, there is reduced or no incentive to monitor. Depositors channel more of their funds into risky banks because they offer higher returns at now extra risks. By cushioning banks and depositors from the downside risk of failure the cost of failure is fully shifted on to the taxpayers who, to a large part, are exactly "the small depositors" to be protected. Therefore, the adverse incentives arising from deposit insurance have to be counterbalanced by regulators, e.g. by constraining banks' operations as the level of capital decreases. Such constraints may worsen a bank's financial condition if the

[64] Negative effects on competition are an important indirect effect of financial regulation (FSA, 2000, p. 24).

[65] Central banks usually also act as LOLR and stand by to inject extra liquidity into the market or individual bank to alleviate temporary liquidity shortages. Clearly, insolvent banks should not be helped by central banks. However, too much LOLR support may increase moral hazard. Such support reduces the incentives for banks to keep up liquidity since they can always obtain liquidity for free from the central bank at last resort.

[66] After the devastating 1929-33 financial crises, the US government established the Federal Deposit Insurance Corporation (FDIC) to safeguard deposits. Since the bank failure rate declined substantially thereafter and remained extremely low until the early 1980s deposit insurance was regarded as an important factor in stabilizing the US banking industry. However, the 1980s banking crisis has made economists very sceptical of deposit insurance. See Spong and Sullivan (1999).

bank's ability to adapt to changing market conditions and to diversify risk is reduced. Deposit insurance and the countermeasures to the inherent moral hazard can thus make the whole system more vulnerable to unanticipated shocks.[67]

Under the traditional regulation approach, failures, even of large banks, should only be prevented if systemic risk or contagion is to be expected. As expressed by Hoenig (1996, p. 8), regulators should be guided by a clear dictum: "While preventing runs on solvent institutions is desirable, preventing runs on insolvent institutions is not." In other words, regulators have to encourage customers to reallocate funds to healthy institutions rather than bail out a troubled bank. However, in practice large failing banks have rarely been left to go under. Even if contagion is unlikely regulators are susceptible to step in and bail out. This almost-for-sure rescue induces the adverse incentive for financial institutions to grow internally or externally to reach the "too-big-to-fail" size class as soon as possible.[68] Furthermore, it is not always clear who is going to bail out: central banks or the Ministries of Finance. This might cause agency problems with and between regulators.

3.5.2 Asymmetric information

In supervising banks through periodic examination regulators face a principal-agent conflict of the same nature as between banks and borrowers or banks and depositors. In particular, asymmetric information puts regulators at a disadvantage. For timely and proper countermeasures regulators require sufficiently accurate information on a bank's current situation and its prospects. Ideally, regulators should have the same information on a bank's on- and off-balance sheet activities as the bank itself. Moreover, the regulator needs to apply the same techniques employed by the bank to evaluate its risk profile. Only then asymmetric information could be overcome. In actuality, this is hardly ever the case. Therefore, it is natural that regulators are always almost one step behind the banks. Regulatory intervention then often comes belatedly. Another problem associated with monitoring and supervision is regulatory capture and regulatory forbearance. In a system in which banks, non-financial firms and public agencies have close relationships regulators may become entrenched and hesitant to take action.[69]

[67] So far, this section has taken it for granted that deposit insurance can't work similar to private insurance, where risk premia are paid in advance, and that necessarily the tax payers bear the burden. But in fact, premia are paid in advance by the financial institutions themselves - at least in some countries (but for sure not in all). However, it is true that the argument can be continued even in the 'premia paid in advance' case and in fact the banks might charge their clients, 'the depositors to be protected', for the premia they have to pay.

[68] Haubrich (1999) shows that with risk aversion a deposit insurer will be worse off with larger banks.

[69] See e.g. Furman and Stiglitz (1998), Llewellyn (2000).

3.5.3 Restricting competition

Regulators face a trade-off between efficiency and market power. If banking is indeed subject to substantial economies of scale and scope, as frequently claimed, entry restrictions may avoid inefficient market fragmentation but allow for market power and collusive behaviour of the incumbent banks.[70] Regulation in many countries was for a long time aimed at controlling and limiting entry to the industry and softening competition among incumbents (e.g. through interest rate ceilings, limiting activities) to keep charter values (banks' net worth) high. The underlying rationale was that high charter values provide the buffer against failure and systemic instability. Globalization and liberalisation rendered these anti-competitive regulatory practices unacceptable and led to their abolishment in many countries.[71] The next chapter elaborates further on the trade-off between stability and competition.

3.6 Empirical evidence

To investigate the influence of banking regulation on financial stability a strand of the literature has analysed historical periods in US banking and elsewhere in which banking regulation was less strict or absent. The evidence on the free banking era does not support the argument that free-entry banking induces instability.[72] With EMU and globalizing markets a legitimate concern of policymakers is that a local banking crisis may spread like wildfire. Moreover, due to the development of financial conglomerates, securities and insurance businesses could play a role for contagion. However, "universal" contagion has not been a typical feature of the major historical banking crises.[73] Rather "flights to quality", with depositors reallocating funds from weak institutions to stronger ones, have been observed, indicating that depositors are better able to tell sound from unsound banks than policymakers commonly are willing to believe. Market discipline seems to be playing an effective role in reigning in bank managers. Recent empirical

[70] See Winton (1997) for a theoretical analysis of the conditions under which regulators may wish to impose temporary entry restrictions, along with partial insurance. Winton shows that regulators face a trade-off between market fragmentation and market power. Entry restrictions reduce fragmentation but facilitate collusive behavior of the incumbents, while government insurance for investors reduces incumbency advantages and collusion but may cause excessive fragmentation.

[71] See OECD (1998b).

[72] See on the US free banking era Rockoff (1974), Rolnick and Weber (1983, 1984) and on other countries, e.g. White (1984), Economopoulos (1988), and Dowd (1992). See Aharony and Swary (1983), Bordo (1986), Calomiris and Gorton (1991), Saunders and Wilson (1996), Calomiris and Mason (1997) for later periods with banking crises.

[73] See Benston, Eisenbeis, Horvitz, Kane, and Kaufman (1986, ch. 2), Kaufman (1994).

evidence is also in support of this view.[74] Another reason not to underestimate today's average depositor's willingness and ability to assess banks is that commercial as well as non-profit information processing agencies (rating agencies, data gatherers, disseminators) have grown in numbers and have made the financial sector much more transparent. This is, however, more true for the Anglo-Saxon system where disclosure requirements are much stricter than for e.g. the secretive Continental European financial sector. There is not much (if any) evidence in the contagion literature, which identifies increased competition as the source of instability or crisis. Also the recent banking crises in Asia and Scandinavia can hardly be blamed on increased competition but rather on serious institutional weaknesses and ineffective governance of powerful financial institutions in the respective countries.[75]

There is some evidence for US banks in the 1980s that increased market power reduced default risk.[76] Deposit insurance seems to increase risk taking and bank risk by shielding off banks from capital market discipline.[77] With the deregulation of national financial markets and liberalisation of capital flows the potential for portfolio diversification has increased, especially for US banks. Portfolio diversification further depends on the development of financial markets and the availability of instruments for risk management. New empirical evidence suggests that the removal of barriers limiting the affiliation of banks with non-bank financial firms allows banks to diversify their portfolios into new activities that raise rates of return at little or no increase in risk.[78] One recent study finds that diversification of banks into non-bank securities and insurance lowers a bank's overall risk but raises systemic risk exposure which outweighs the benefits from bank-specific risk reduction, synergies and demand effects.[79]

[74] See e.g. Avery, Belton and Goldberg (1988), Park (1995), Martinez Peria and Schmukler (1998). Avery et al. and Park provide empirical evidence that banks are monitored and disciplined through large wholesale depositors. Looking at Argentina, Chile and Mexico where deposit insurance has notoriously been imperfect Martinez-Peria and Schmukler (1999) find evidence that also small depositors monitor banks and punish bad performance effectively. See Flannery (1998) for a survey of the empirical evidence on the role of market discipline.

[75] See Furman and Stiglitz (1998) and Llewellyn (2000) for discussions of the multiple factors underlying recent crises.

[76] See Keeley (1990).

[77] See e.g. Grossman (1992), Carr, Mathewson and Quigley (1995), Demirgüç-Kunt and Detragiache (1999), Billett, Garfinkel, O'Neal (1998). See Akhigbe and Whyte (2001) for contrary evidence.

[78] See Reichert and Wall (2000).

[79] See Allen and Jagtiani (2000). A bank's overall risk is defined as the standard deviation of the bank's daily stock market returns. Bank-specific risk is the portion of a bank's stock price volatility that is unique to the bank and reflects its loan, investment, deposit, and capital structure decisions. The difference between total and bank-specific risk is called systemic or systematic risk. See de Bandt and Hartmann (2000) for a survey on systemic risk.

Some other studies have investigated the impact of the regulatory regime on banking efficiency. For the US, deregulation has positively affected allocative efficiency.[80] Cross-country evidence suggests that tight regulation of the banking sector causes not only inefficiency but raises the likelihood of banking crises. Interestingly, banking crises are more likely in countries that restrict or forbid equity holdings of banks in non-financial firms.[81] Banking crises occur more frequently in countries with explicit deposit insurance schemes but ineffective systems of prudential regulation or inexperience in supervision. This finding indicates that banks take higher risks if depositors are insured comprehensively and the system of regulation and supervision is less developed.[82]

But how do we know if banks take excessive risks? Consider Table 3.4 that shows the average return on equity (ROE) of the banking sector over the period 1989-1997 across 11 EMU countries, Japan, the UK, and the US. The banking sector's average ROE is highest in the UK (34%), US (26%) and Luxembourg (23%) and lowest in Japan (12%) and Finland (-9%). The negative ROE in Finland (-9%) can be attributed to the Scandinavian banking crisis. The ROE for the remaining countries lies between 16 and 20%. Research by CSFB (1999) has shown that the long-term real return for investing in the equity market is 10 to 12%. Then, an inflation rate of 2% on average over 1989-1987 implies a long-term nominal return of 12 to 14%. This in turn implies that the ROE of banks should also be close to 12 to 14% except when the banking sector is constantly taking higher risks then other companies quoted on the stock market. If banks take more risks, shareholders will demand higher returns on equity to be compensated for these higher risks.

If banks are constantly taking higher risks because of bailout expectations, there is need for regulation since without such regulation, banks' managers would attach a too low weight to stability. But, regulation here is not firmly grounded on a market failure in the banking sector. Such regulations should be kept to a minimum since the banking sectors' relatively high return on equity might be the result of favourable business cycle circumstances. Or, returns may be higher because of improvements in the banking environment such as growth of the relevant

[80] Evanoff (1998) finds for large US banks during the period 1972 to 1987 that tighter regulation lead to statistically significant but relatively minor allocative inefficiencies: "Allocative inefficiency was a factor in 1972-79, but was nearly nonexistent in the later period (1984-87, considered to be the deregulated environment). Banks apparently responded to the deregulated environment by altering their production process to fully exploit scale economies, and reaped significant returns from technological change. We conclude that the heavy regulation of the earlier period had a significant adverse effect on banking efficiency."

[81] See Barth, Caprio and Levine (1998, 2000). They conclude from the evidence based on a new and unique World Bank data set of more than 60 countries that "it does indeed matter what a bank is permitted to do. The imposition of tight restrictions on some activities of banks appears not to be beneficial but, worse yet, downright harmful in some important ways."

[82] See Demirgüç-Kunt and Detragiache (1999) who have used the same World Bank data as Barth, Caprio and Levine (1998, 2000).

market. In the long run, a much higher ROE in the banking sector would attract new capital, either by the capital of new market entrants (lack of competition could be another explanation for high ROEs of banks), or by investment of incumbents, lowering the ROE to normal levels.

Table 3.4 Banks' average returns on equity in EMU member states[a], Japan, UK and US (in percentages), 1989-1997

Austria	Belgium	Finland	France	Germany	Italy	Luxembourg	Netherlands	Portugal	Spain	Japan	UK	US
19	20	–9	16	19	20	23	20	19	17	12	34	26

[a] Except for Ireland because of data availability
Return on equity is net income divided by capital and reserves
Source: Own calculations based on OECD (1999).

3.7 Concluding remarks

The main motivation for regulation of the banking sector is financial instability, i.e. an adverse impact on the real economy from dysfunction in the financial system or the risk thereof. Instability originates in market failures associated with information asymmetries, agency conflicts, indivisibilities and externalities. Because the social costs of financial instability may far exceed the private costs, regulation can be justified. The types of regulation are manifold. Some types of regulation introduce their own problems or inefficiencies and may conflict with other public objectives. In particular, regulation and financial stability may be closely related to competition issues in the banking sector, as we discussed in chapter 2. The next chapter elaborates more on where stability and competition meet and whether there is a potential trade-off.

4 Trends and the trade-off between competition and stability

Policies to prevent financial instability may have adverse consequences for competition among banks. At the same time, unbridled competition in banking may give rise to the threat of instability. Hence, there can exist a trade-off between competition and stability. An important question is how to identify the presence of such a trade-off in concrete cases like specific markets or particular types of regulation. This chapter develops a framework that enables us to do so. In particular, it suggests a four-step procedure to explore the impact of competition on stability. It also considers the role of public policy to find an optimal balance between the goals of an efficient banking system with appropriate market forces, and a stable financial system.

The concrete appearances of the trade-off between competition and stability are conditional on the environment in which banks operate. Trends can change this environment and, therefore, the trade-off. To understand how recent developments in the financial sector affect competition, stability, and their interaction, this chapter starts with summarizing a number of trends in the financial sector.

This chapter does not provide an in-depth analysis of concrete appearances of the trade-off between competition and stability. Indeed, we employ brief examples to clarify our analytical framework. Part II of the study discusses in more detail three illustrations of the trade-off. These illustrations also elaborate a bit further on the concrete policy issues related to banking.

4.1 Trends in the financial sector

Headlines usually point at it: banking is in turmoil. Indeed, the environment in which European banks operate has been subject to substantial change. For one part, this is due to the changing institutional environment such as the recently established Monetary Union and developments in regulation and supervision of banks. For another part, changes originate from technological development such as the Internet and Information and Communication technologies and developments on the demand side, resulting in disintermediation. Below, we elaborate on these exogenous trends in more detail.

The changes in the banks' environment have also induced behavioural responses by banks. Indeed, during the last decade we observe a boost in mergers and acquisitions among banks and other financial institutes and increasing internationalisation and diversification. In the second part of this section, we discuss these changes in the financial landscape.

4.1.1 Exogenous changes in the banks' environment

We first discuss three trends that are more or less exogenous to banks. These are, respectively, institutional changes, technological developments and changes in the demand for financial products.

Institutional changes

Historically, European credit institutions have been subject to multiple regulatory constraints. In the early 1980's government intervention included a variety of prohibitions affecting listing in the stock exchanges, diversification in non-banking financial services and foreign bank entry. Several restrictions applied also to branching and interest rates. At the same time, capital controls were widely used as an instrument of monetary policy. In this environment, three major dimensions defined the relevant market: national borders (segmentation, regional markets), market players (e.g., banks versus saving banks; private vs. co-operative or state-owned banks) and products (e.g., commercial versus investment banks). Hence, prior to the single market program, we find a heterogeneous group of fragmented and regulated financial markets. On the one hand, this system of "bank clubs" opened the door for anti-competitive practices. On the other hand, it had a positive effect on charter values and, consequently, reduced the probability of financial failure. To a certain extent, stability and solvency were at a premium with respect to efficiency and lower prices for customers.[83]

These stylised facts underlie the reforms launched by the European Commission and the national governments in the late 1980's and early 1990's. This so-called "competitive deregulation" process was mainly driven by the First (77/780) and the Second (89/646) Banking Directives in combination with the Own Funds (89/299 and 91/633) and Solvency Ratio (89/647 and 94/7) Directives. Most of the prevailing legal restrictions were abolished in accordance with the principle of mutual recognition and the single banking licence. In practice credit institutions that established in one European country no longer needed national authorisation to supply the same financial services in other member states. The European market integration also meant the removal of controls on capital flows.

At the end of the 1980's, the Basle Committee on Banking Supervision developed the first capital adequacy requirements called the 1988 Basle Accord. The implementation of the Second Banking Directive into the national law of all the EU states around 1992-1994 represents a break point in the banking sector (Gual, 1999). A single passport, mutual recognition and host-country control are the main principles to be developed by the renewed legal framework. This was accompanied in the monetary field by the call of the Maastricht Treaty for the creation of the European Central Bank. Since 1996, the Banking Directive also brought *market risks* into

[83] Some indirect evidence on collusive behaviour and regulatory capture can be found in Dermine (1990) and Neven and Roller (1999). The concept of "charter value" and its relationship with (de)regulation are a matter of discussion in Marcus (1984); see also Davis (1995).

the calculation of capital requirements, in addition to credit risks. Furthermore, banks were allowed to use their own *Value at Risk* (VaR) models to cover market risks (Santos, 2000, p. 18). In mid-1999, the Basle Committee proposed to amend Basle's original framework for setting capital charges for credit risk. The 1999 proposals intend to *refine the capital charges* by making them more dependent on the risk profile of a bank. The proposals also develop capital charges for *interest rate risk* in the banking book and *operational risk*, and, under certain conditions, endorse the banks' internal *credit risk models*. Finally, the proposals intend to strengthen the *disciplining effect of financial markets* by requiring more information disclosure about the creditworthiness of banks.[84]

Now that EMU has been established between 12 EU member states, this will no doubt have additional important implications on the financial services industry. Indeed, a recent report by the ECB (1999) affirms "that the EMU is likely to act in the medium and long term as a catalyst to reinforce already prevailing trends in the EU banking systems".

Technological changes

During the last decade, banks have invested hugely in new technologies such as computers and Automated Teller Machines (ATMs). In the EU, for example, the number of ATMs per 1000 capita has increased from 0.10 in 1985 to 0.44 in 1997 (ECB 1999). Since the mid-1990's, business-to-consumer and business-to-business transactions are often managed using a Personal Computer (PC), the World Wide Web and a browser (*Netscape, Explorer*). Internet banking has thus become a target for all the major banks. There is a wide consensus among industry observers that the future of the retail (universal) banking rides more and more on remote and Internet banking. Moreover, on-line financial services can be obtained by electronic means other than PCs. Namely, the Wireless Application Protocol (WAP) of the mobile phones and the interactive TV (Maude, Sahay and Sands 2000). Many European households will soon be surfing the Net with these devices. In fact, some banks (e.g., *HSBC* and *MeritaNordBanken*) and financial companies (e.g., *Fraser Securities, Fidelity* and *Fimatex*) are already using the WAP platform to provide complex transactions such as trading stocks or bill-payment services. Other financial institutions have opted for holding shares in digital and cable TV projects that have recently been launched all around Europe.[85]

On-line intermediation is typically cheaper because remote access reduces the costs of physical and human assets. Recent estimates for the US suggest that the average costs of on-line channels are up to 100 times lower than those of the traditional branch-based ones (see table 4.1). Besides the lower cost of electronic transactions (Belaisch et al., 2001), savings arise from the economies of gathering information (e.g., advertising; matching other B2C transactions),

[84] See www.bis.org for the most recent information.

[85] Among others, HSBC, *Abbey National* and *Halifax* in *Open* (UK); *Abbey National and Halifax in NTL* (UK); *Crédit Agricole* in TPS (France); *BBVA* and *La Caixa* in *Via Digital* and *Canal Satélite Digital* (Spain).

standardisation of processes (e.g., customers data sets) and cross-selling of non-banking products (e.g., insurance outlets).

Table 4.1 Cost of alternative distribution channels

Channel	Estimate cost per transaction ($)
Branch	1.07
Telephone	0.54
ATM	0.27
Internet	0.01

Source: *Booz-Allen and Hamilton*.

Distribution aside, many other aspects could be affected by new technologies.[86] From a technical point of view, efficiency gains are likely to be obtained because of the information-intensive nature of the industry. From a competition viewpoint, the need for compatibility and interoperability that characterise banking business makes such investments absolutely essential [87]. Moreover, it is argued that they will pay off by raising productivity and reducing the costs of outsourcing (Fixler and Zieschang, 1999; Rhoads and Ascarelli, 1998). On the other hand, margins are expected to narrow. More easily tradable services and the reduction of entry barriers and switching costs are indicators commonly associated with increasing competition. The reduction in switching costs will be reinforced if the proposal for a harmonised European account number structure (called International Bank Account Number) will be implemented in 2002, as was suggested by the European Committee for Banking Standards.

All these phenomena make up a currently growing trend in the sector. ICT have attracted the attention of many market players, but financial markets, banking and insurance are leading the game (OECD, 2000a). However, the penetration of these technologies is still relatively low in many developed countries. For example, by the end of 1999 Internet and mobile phone penetration per thousand people was around 30% in France, Germany and Spain. Small industrial firms show similar figures (OECD, 2000a). Therefore, there is a wide scope in banking for further increases in so-called "e-commerce" and "m-commerce".
Some caveats apply to this positive picture, however. First, some technical problems are to be solved, including security in transactions.[88] Second, there is a high degree of uncertainty around

[86] "For example, the cost of customer service telephone reception can drop from 7% to 1% of the cost of a bank's office management, if a voice response unit can be used. Also, products can be better handled, services can be expanded, consumer purchasing behaviour can be analysed to increase efficiencies in the marketing process. In addition, the entire demand flow can be automated and reduce personnel costs", (OECD, 2000 pp. 56).

[87] Some of the recent trends mentioned above (e.g., diversification, internationalisation and globalisation) cannot but emphasise this feature.

[88] A related issue is that many customers may still prefer a face-to-face treatment in many financial services.

some lines of on-line business. Success is not guaranteed and failures may indeed appear.[89] Incidentally, this will affect credit and market risks. Thirdly, attention has to be paid to the "digital divide" that may arise between those who have access to the technology and those that does not. The "knowledge society" is not uniformly distributed among countries, sectors and economic agents. Banks' managers run the risk of offering products not catering to customers' preferences. Finally, cost reduction is only one side of the coin. Many "dot.com" firms are start-ups in need to build up a reputation and a well-known brand name. This usually demands both lots of economic resources and a long time. Moreover, the likelihood of failure tends to be very high in these young firms.[90]

In spite of these caveats, the adoption of the new technologies in banking is advancing rapidly and more is to be expected in the near future. Today TV interactive companies in Europe are mostly TV-programmes broadcasters, still underdeveloped as an electronic channel through which financial institutions provide services. Similarly, more powerful platforms for the Net-enabled mobile phones are just around the corner (the "third generation"). There is thus a long road ahead in which competition among the first movers will presumably be high in the short to medium term. In addition, markets and products that used to be shielded from international competition will be open to new entrants. On the demand side, higher price transparency means that customers can more easily compare offers and switch to the more attractive one.

Disintermediation

Innovations account for many of the changes spurring "disintermediation", a buzzword describing the removal or circumvention of banks as middlemen in the savers-borrowers chain.[91] The creation of money market mutual funds and the securitization of assets through non-bank financial institutions have raised the importance of capital markets in credit intermediation. Disappointed with the low interest paid on both checkable and time deposits, depositors have taken their money out of banks to invest in higher yielding assets, such as stocks or money market funds. In addition to the higher yields, money market funds offer their shareholders (or depositors) also typical banking services, such as check writing facilities. Through medium-term note facilities and junk bonds corporations have gained direct access to

[89] The mortgage market is an illustrative example (see Baghai and Cobert, 2000).

[90] Geroski (1995).

[91] Based on an empirical investigation of French, German and UK banks Schmidt, Hackethal and Tyrell (1998) disagree that there is a general trend of "disintermediation" in these leading EU countries. Rather they find what they call a "lengthening" of intermediation chains, with nonbank financial intermediaries becoming increasingly important in gathering capital from the non-financial sectors.

external finance. As a consequence of these changes, new markets for intermediating risks (on- and off-balance sheet derivatives) have emerged.[92]

Schmidt et al. (1998) use French, German and British data over 1981-1996 and show that the French banking system indeed shows traces of disintermediation and securitisation, while in Germany and the UK there is evidence for securitisation. In fact, banks in all these countries tend to specialise in lending operations and to abandon the collection of savings, which are gradually becoming a concern of the non-banking credit institutions.

4.1.2 Behavioural changes by the banking market

Regulatory adjustments and technological developments have provoked behavioural responses in the banking sector around the world. For the sake of the exposition it is useful to describe these responses separately, although some are closely related to each other so that interactions among them may certainly exist.

Internationalisation

In contrast with the frequent references to *internationalisation* in the headlines of the financial press, it appears that the European banking sector is predominantly a national-based business. According to White (1998), cross-border offices within Europe represented less than 0.3% of the total bank offices in 1998. Moreover, the ECB (1999a) reports that in 1997 the domestic market share of the foreign branches and subsidiaries (as a percentage of total domestic assets) was below 11% in 13 of the EU countries. However, statistics for the whole sector hide important exceptions to this pattern both at the national (e.g., Ireland, Luxembourg and the UK) and the company level (e.g., investment banks). Therefore, the impulse provided by the above mentioned regulatory changes may have been insufficient in some areas but the growing tendency towards a global market is unquestionable. Hence, internationalisation may be an inevitably important trend for the coming decade.

Consolidation

Mergers and acquisitions in banking seem to be a common trend all around the world. Available data show that the amount of resources involved is remarkably huge (Berger et al. 1999) while the expansion of commercial banks is illustrative of how European banks look for scale and scope. Some global statistics illustrate these movements towards consolidation. Groeneveld (1999) shows that the total number of banks per 10.000 inhabitants in the EU fell from 0.41 in 1985 to 0.39 in 1990 and 0.29 in 1995. Walter and Smith (2000) report that, during the 1990's,

[92] These newly established markets help banks reduce risk by "unbundling the total risk of an asset into its component parts and then transferring combinations of those components to those who are most willing and able to bear risks" (Hoenig, 1996, p. 6). This "risk intermediation" allows both financial institutions and nonfinancial corporations to manage portfolio risk more actively.

mergers and acquisitions in the banking sector have been high compared to other sectors: the value of the (large) deals affecting European "Depository Institutions" during 1985-1991 represent around 7% of the total corporate transactions. For the 1985-1999 period, this figure has raised to 11 %.

According to figures by Walter and Smith (2000), merger and acquisition activity in Europe increased steadily in the 1985-1992 period and reached its peak in 1989-1990. Later it displays a soft decline until 1994-1995 and since then a new increase, with a second peak in 1998-1999. Most of these transactions are still between national banks but increasing competition, internationalisation and the forthcoming Euro and the EMU may have induced an increasing cross-sectoral and cross-border activity[93] (ECB, 1999a; Berger et al., 2000b). Although there exist close relationships between banks and non-financial companies, the current trend in Europe shows an important number of M&As *inside* the financial sector, i.e. between banks and non-bank providers of financial services (White 1998). [94]

The ECB (1999, pp. 21) suggests that more and more "banks are looking for new business opportunities abroad". Indeed, the volume of cross-border transactions increased spectacularly in 1998-1999. Hence, there is an increasing trend in the number of branches and subsidiaries in foreign countries (as a percentage of total domestic assets).

Diversification

Banks have not just idly stood by and watched but reacted to these changes by adopting pro-active strategies. As continental European banks frequently operate as universal banks, a quite natural and therefore unsurprising response has been to include institutional investors in banking groups to establish uniform corporate strategies. More recently, we have been observing initiatives of banks and insurance companies to team up in financial conglomerates or strategic alliances. These strategies help consolidate banks' liabilities side. On the assets side, banks still benefit from their advantage in the financing of households and small and medium-sized enterprises. They have added services particularly designed for large corporations or investors, such as backup lines, underwriting facilities and treasury management. Further, they are moving into active trading, securitisation and e-commerce.[95]

This trend is supported by the evidence. Banks' income can generally be split in net interest income obtained from the financial intermediation and the income earned from alternative services (i.e., non-interest income and off-balance sheet activities). Hurst et al. (1999) reveal that the share of the non-interest income in total income has been continuously increasing in Europe

[93] This combination has probably contributed to the rise of the so-called "megamergers", i.e. M&As between institutions with assets more than $1 billion each.

[94] A particularly successful association is the so-called "Bancassurance". In the last decade organisations combining banking and insurance services constituted around 10% of the M&As in Europe (Lown et al., 2000).

[95] See Wenninger (2000) on e-commerce activities of US banks.

since the mid-1980's. Net interest margins (Net Interest Income / Total Assets) have followed a smooth downward trend in Europe. Income generated by sources other than financial intermediation are rather stable at around 8% of total assets in euroland.

4.2 An analytical framework for identifying trade-offs

Intensified competition and financial stability do not always conflict. For instance, if intensified competition yields more information to market players, it may improve the confidence of the public in banks, thus reducing the threat of instability. In other occasions, however, the goals of competition and financial stability will not coincide. In these cases, there is a trade-off. This section contains a four-step procedure to identify possible trade-offs between competition and stability in the banking sector. This procedure forms the analytical framework for the analysis in part II of this study, where we analyse three illustrations of the trade-off. In principle, the framework can be applied to other markets or cases as well.

Step 1: What causes instability?
To identify a potential trade-off, it is necessary to first understand what causes instability. This boils down to translating insights from chapter 3 to concrete markets or cases. The fundamental reason for instability lies in the presence of market failures, such as asymmetric information or externalities (contagion). The market failure in itself is the reason why there *could be* instability. However, it does not imply there *is* a threat to stability, even in absence of any regulation. Indeed, instability may be triggered by sudden shocks. These involve not only macroeconomic shocks, but also refer to competitive shocks or institutional shocks. In fact, all potential changes in the environment of banks that are non-gradual can be viewed as shocks that may trigger instability. So step 1 specifies the market failures relevant in a specific case and identifies the possible shocks that trigger instability.

Step 2: What is the impact of increased competition on stability?
Once we know the potential cause of instability in a particular case, the next step is to get an understanding of how increased competition influences stability. There are two ways in which intensified competition can endanger stability. First, increased competition may change market failures. In particular, competition may either intensify or reduce existing market failures (see the following two boxes). Second, given the existing market failures, intensified competition can induce a shock by itself. To illustrate, a sudden drop in entry barriers possibly leads to declining risk premiums, increasing indebtedness, increased herd behaviour, a general increase in market uncertainty and, finally, declining capitalization. Thus, a competitive shock can threaten financial stability.

Competition intensifies market failure

One strand of the literature argues that problem of incomplete markets and asymmetric information are difficult for a competitive banking system to overcome. This may justify a more concentrated banking system because the negative effects of more market power are outweighed by the positive effects of lower informational problems and more complete markets.

Let us first focus on relationship lending where financial institutions channel funds to borrowers which cannot tap the capital markets directly. Increased competition impairs relationship lending by aggravating adverse selection and moral hazard problems. In particular, interbank rivalry gives lower-quality borrowers more opportunities to get a loan. If their loan application is rejected at one bank they can go to another. More low-quality borrowers make the adverse selection problem more virulent. When borrowers can switch to other capital providers at a later stage, the moral hazard problem may become more severe. Informational asymmetries are particularly pronounced with respect to financing start-ups, small firms without a track record and firms with knowledge-specific projects (R&D) (see Audretsch and Weigand, 1999; Haid and Weigand, 2001).

A bank has an incentive to invest in information-intensive but potentially profitable borrowers, if it can develop a longer-term lending relationship with the borrower. In repeated interactions with the borrower, the lending bank can gain inside information on the borrower and reduce informational asymmetries (Fama, 1985). If the bank is able to extract surplus through subsequent lending or fee-generating businesses in later periods, it can offer lower rates to a borrower initially or keep rates low when the borrower faces temporary credit problems. However, as soon as the borrower's venture has turned profitable, he becomes attractive for other banks or funders. Rival banks will have a cost advantage over the first-stage financier, since they do not have to recoup the initial investment in information gathering and funding the unprofitable initial stage. The borrower has an incentive to switch to lower-cost sources of finance instead of prolonging the business relationship with the initial bank. Ex-post competition in the credit market may thus ration lending ex ante. Less intensive competition and market power could safeguard the intertemporal sharing of surpluses and decrease credit rationing (Petersen and Rajan, 1994, 1995). Market power reduces the free-rider problem and enhances the incentives of the lender to monitor borrowers and develop longer-term relationships (Besanko and Thakor, 1993; von Thadden, 1995). The welfare implications are ambiguous, however (Caminal and Matutes, 1997a).

Theoretical models show that in a more concentrated banking system, banks limit their risk exposure because relationship banking generates informational rents and bank profits tend to be higher (Besanko and Thakor, 1993; Boot and Thakor, 1993; Allen and Gale, 2000c). Also reduced competition for deposits curbs the incentive for excessive risk taking (Matutes and Vives, 2000). Therefore, imperfect competition may be good for financial stability. However, other theoretical contributions support the opposite conclusion as they show that competition lowers the probability of failure (Caminal and Matutes, 1997b; Koskela and Stenbacka, 2000) and mitigates macroeconomic shocks (Smith, 1998).

Competition forces banks to shape up incentive schemes to eliminate managerial slack and X-inefficiency (Hart, 1983; Hermalin,1992; Schmidt, 1997; Stennek, 2000; Kulpmann,2000). However, the welfare gain through enhanced X-efficiency may be offset by a less efficient risk allocation (Stennek, 2000). Further, there is an incentive problem for monitors, since they have to share the gains from monitoring with the investors while bearing the full monitoring costs. This problem can be overcome by diversification when ownership is concentrated (Cerasi and Daltung, 2000). Therefore, there may be a stabilizing effect of conglomeration if financial conglomerates indeed operate with large portfolios of non-correlated, debt-financed projects. However, if all players follow the same diversification strategy and hold similar portfolios, contagion remains a threat.

Competition reduces market failure

There is another way to solve the free-rider problem, which does not depend on the exercise of market power in the credit market (as discussed in the previous box). Allowing lenders to hold equity positions in the borrower gives them a property right on the upside potential and future gains. In some countries (e.g. Germany), banks are allowed to hold equity interests in non-financial firms, whereas in others (e.g. United States) such holdings are restricted or forbidden.

It is not clear that the borrower can run away from his first-stage financier so easily, since he faces a hold-up problem. Solving the initial information problem does impose on the bank costs, which may be hard to recoup under intense competition. However, the investment in information creates an important benefit: the outcome of monitoring is private information and not verifiable to rival banks, which would lend to the borrower as soon as he becomes a good risk. The first-stage financier has an informational first-mover advantage. The specific knowledge on the borrower's solvency gives the lending bank a strong position and a competitive edge over these rival banks. If there is no or incomplete information sharing among banks on accepted or rejected loan applicants a rival bank has to do its own costly information acquisition. Less informed rivals have to worry about the "winner's curse" when they start to compete with the incumbent bank by offering a more attractive loan contract to the borrower (Riordan, 1993; Shaffer, 1998). The rival bank may just then get the business, and "adversely" select a new client, when the better informed incumbent bank is willing to terminate the lending relationship because the borrower's solvency has deteriorated. The first-mover advantage and the "winner's curse" may allow the incumbent bank to hold the borrower up and extract a surplus from the relationship by charging him a higher loan rate.

Exchange of information among creditors on the track record of their borrowers is obligatory and institutionalized in many countries so the severity of the information-based hold-up problem is mitigated. Information sharing has been shown to have positive welfare implications as it reduces adverse selection effects (Pagano and Japelli, 1993), curbs the information-based monopoly power of banks and disciplines borrowers (Padilla and Pagano, 1997, 2000).

Rather than reducing relationship lending increased interbank competition may induce banks to make more relationship loans because investing in relationships can be profit-maximizing for banks under competition pressure to differentiate themselves from competitors (Boot and Thakor, 2000). Put differently, competition forces banks to become more client-driven and tailor their services more to the needs of customers.

To sum up, informational problems play an important role in the financial sector and complicate the assessment of structure-conduct-performance links. As discussed with respect to relationship lending there are costs and benefits of increased interbank competition. Welfare implications are not clear-cut. It is an empirical question then whether banks under competition are indeed less able to subsidize new or small borrowers at the expense of established good-risk borrowers.

As regards relationship lending, US evidence indicates credit rationing of smaller borrowers in more concentrated markets and by large or consolidating banks.[a] Credit rationing is mitigated or absent when smaller borrowers can switch to other suppliers of funds.[b] With respect to loan rates charged to smaller firms, the evidence is mixed.[c] For European banking there is evidence that the terms of credit contracts deteriorate with the duration of the lending relationship (Degryse and Cayseele, 2000). This suggests that borrowers face hold-up problems, maybe because concentrated European banking markets make it more difficult to switch to other sources of funding.

[a] See Berger, et al. (1995), Berger and Udell (1996), Peek and Rosengren (1998), Berger, et al. (1998). For conflicting evidence see Jayaratne and Wolken (1999). Boot (2000) provides a survey on relationship banking.

[b] See Berger, et al.(1998), Goldberg and White (1998), Berger, et al. (1999), DeYoung, Goldberg and White (1999).

[c] Hannan (1991) finds that concentration raises loan rates for small firms, whereas Petersen and Rajan (1994, 1995) report more credit and lower loan rates for small firms in more concentrated markets.

Step 3: How do trends influence competition, stability and their interaction?

Given the channels through which competition affects stability, either via market failures or shocks, we can take the third step in the analytical framework. Here, we explore the impact of trends. In particular, we distinguish three direct effects of trends on stability. First, trends may affect market failures. To illustrate, internationalization implies that banks are more closely connected to foreign players. This may intensify external effects since a bank failure in one country will more easily spread to other countries. Second, trends can make shocks more likely, more frequent, or make their impact heavier. For example, information and communication technology can make markets more transparent and reduce information asymmetry between banks and their clients. This may reduce the probability of bank runs since the public is better informed about the position of their bank. Finally, a trends can be a shock in itself if it is a sudden event. For instance, think of an innovation that, through a quick adoption, leads to a non-gradual increase in competition and therefore to a shock. The next Box gives some examples on how trends affect financial stability.

Apart from direct effects, trends may also exert indirect effects on stability through their impact on competition. The next box shows how some of the trends in the past have increased competitive forces in banking. As discussed in step 2, this may have implications for stability through the effect of competition on either market failures or shocks.

Trends can also change the link between competition and stability. Indeed, competition may have different implications for stability if banks operate in a different technological, institutional or economic environment. Apart from having a different impact on competition, trends can also make competition more or less desirable. For instance, new technologies can introduce new economies of scale so that the optimal bank size increases. In that case, trends change the optimal trade-off between competition and stability.

Step 4: What is the role of policy to maintain the balance between competition and stability?

Once we have determined how trends affect competition, stability, and their interaction, we are able to look at policy, including regulation and supervision. We first assess whether intensified competition is desirable in light of the trends and whether policy should play a role to further intensify competition. Subsequently, we assess the impact of more intense competition on financial stability. If there is an interaction between competition and stability, we consider how policy can keep instability in check. Is it better to limit competitive forces? Or is it more desirable to modify regulation or supervision? Indeed, regulation can modify the link between competition and stability, but it may also generate anti-competitive and anti-stability effects in itself. The question regarding the optimal policy response can be answered for specific cases by analyzing the underlying causes of instability (step 1) and the channels through which competition affects stability (step 2). In this way, we hope to identify the optimal policy

responses to deal with the threat of instability in the future, policies that do not impinge upon the desirable degree of competition in the sense of an efficient structure of the banking sector.

Trends and financial stability

McCauley and White (1997) argue that bond markets in EMU may gain in strength, depth and liquidity, to the disadvantage of banks that supply traditional intermediated credit. This can impose the risk of ongoing excess capacity in the European banking industry (ECB, 1999ab; 2000abc). Indeed, entry barriers seem to decline faster than exit barriers. Internet banking could intensify the problem of excess banking capacity in many countries. Banks could respond to increased competition by excessive risk-taking, international expansion of their activities, cost reduction, etc. Uncertainty may also pose a problem until the ECB has established a track record. The lack of a clear lender of last resort in the EMU is another uncertainty banks will be facing. Finally, poor international co-ordination of regulation poses a major concern of bankers. Gaps and duplications in regulation may be the result (CSFI, 2000, p. 1).

The growing internationalisation of banking means that banking problems may easily spread across national borders. In financial conglomerates also securities or insurance business could play a role in these linkages. Allen and Jagtiani (2000) find that diversification of banks into securities and insurance business lowers a bank's overall risk but raises systemic risk exposure. Finally, cross-shareholdings among banks or between banks and other financial intermediaries might prove a source for connection.

The wave of mergers and acquisitions is creating bigger banks (usually conglomerates). Bigger banks are more likely to receive public support because of the systemic consequences of their failure.[a] The moral hazard is that such banks may be tempted to take on higher risks, raising the potential for large social losses in case of failure. The government may find these losses too large, and thus may be more inclined to rescue bigger banks rather than smaller ones (an exit barrier). Moreover, a moral hazard problem might occur not only with regard to the bigger banks themselves, but also with regard to other market participants. Market participants may consider systemically significant banks as "too-big-to-fail" from the perspective of the settlement system. Market participants might mistakenly believe that settlements in the books of these institutions have the same quality as settlements in the books of the central bank (G10 Report on Financial Sector Consolidation, 2001). Bigger banks may also entail more complex organisations with associated larger operational risks.

[a] But notice that also the collapse of a small bank may result in a huge financial crisis whenever a situation of financial fragility pre-exists in the economy. So, the financial starting position of banks matters too.

Trends and competition

Deregulation, globalization, and the ICT revolution have been changing the structure of the financial sector over the last two decades.[a] Banks' traditional assets are shrinking, since integrating capital markets and a host of financial innovations provide larger firms with lower-cost alternatives to bank borrowing. Increased competition through deregulation and the ICT revolution affects banks' liabilities. The growing importance of institutional investors, such as investment funds, insurance companies and pension funds, combined with savers now striving to earn an appropriate rate of return even on safest investments (deposits), traditional banks' golden and easy times of collecting savings seem to be over.

The European Commission (1997, pp. 3) concluded in its assessment of the 1985-1995 period that "[c]ompetition intensified in all EU banking and credit markets in the post-single market period and this has been reflected by a decrease in financial services prices in various market segments across countries". Some caveats apply to this assessment, however. First, these effects had an impact primarily on investment banks and large corporate borrowers, being both related to (wholesale) services that may have some contestability properties and/or possibilities of securitisation. The retail sector, in contrast, was affected less. Therefore, small depositors and SME's have not enjoyed much of the benefits of competition. Second, for disintermediation, the supply of services from non-banking organisations - investment funds, insurance companies and pension funds -has grown mostly in the 1990's (Schmidt et al., 1998). Indeed, the so-called "rise of the institutional investors" is a relatively recent phenomenon in most of the EU countries (Baums et al., 1994). Although significant achievements are apparent in certain areas and products, the single and integrated market was far from being achieved in the banking sector (Dermine, 1990; Gual and Neven, 1993; Molyneaux et al., 1994; and Neven and Röller, 1999). Indeed, the impact of deregulation from the early 1990s has been modest in terms of reaching the "law of one price" in Europe while its effects on competition were unevenly distributed among countries and market players.

[a] See Edwards and Mishkin (1995), Miller (1998), Mishkin (1999c) for a general discussion. See Gual and Neven (1993), OECD (1998a,b) and Central Banking Publications (1999) on country-specific changes in regulation, ECB (1999b, 2000a) on technological changes and their impact on the banking system (e.g. the cost of tallying transactions and keeping track of positions has decreased to almost nothing), and IMF (1999) on globalizing financial markets.

4.3 Conclusions

The previous chapters have dealt with either competition or stability in the banking sector. This chapter elaborates on where these two policy objectives meet. In particular, competition and stability may indeed be separate issues that do not have much to do with each other. However, in some cases competition among banks may affect financial stability. Similarly, banking regulation to reduce the threat of instability may seriously hamper competition. This chapter provides an analytical framework that can be used to identify cases in which more competition among banks will indeed threaten financial stability. Furthermore, we discuss a number of trends in the banking sector that may affect competition, financial stability or the trade-off between competition and stability. The analytical framework can be used to address policy questions related to the trade-off between competition and stability in the banking sector. How

this can be applied will be discussed in part II of the study where we give three illustrations of the interaction between competition, stability and public policy.

Part II: Illustrations of the trade-off between competition and stability in banking

5 Competition and Stability in Dutch Retail Banking

Virtually all consumers use financial services. A well-functioning market for retail banking services is indispensable for economic welfare. But how competitive is the Dutch retail segment? There are only a few players (on most submarkets), high sunk costs (mainly investment in reputation), switching costs (think of number portability) and (for a number of products) low transparency. Although hard evidence of weak competition cannot be provided (lack of data), there are a number of indicators that make intensified competition desirable. Regulatory and technological changes are likely to spur competition in the near future, but may well affect financial stability as well. What is the trade-off between competition and stability in Dutch retail banking and, if necessary, what can policy makers do to minimize the adverse effects of more competition?

5.1 Stability in retail banking

Instability in retail banking is not fundamentally different from instability in general. Hence this section can be a short one, mainly referring to the discussion in chapter 3. Instability on the retail market deserves special attention in the case of shocks on the market for real estate, possibly triggered by mortgage competition, and excessive risk taking on the credit market. History has shown several crises in which real estate turmoil and excessive lending played a significant role. For instance, at the end of the 1970s, demand for real estate in the Netherlands was greatly stimulated by low (sometimes even negative) real interest rates and extended mortgage guarantees and generous tax rules by the Dutch government. Overly optimistic economic expectations made many households and banks accept large and risky mortgages. But the subsequent recession and increasing interest rates caused great financial distress, plunging housing prices and deteriorating the collateral of banks' mortgage loans.[96]

Other countries experienced similar problems. Following deregulation, US saving banks in the 1980s were strongly encouraged to expand real estate lending. Strong competition in the market for savings deposits, together with generous deposit insurance schemes, led to a significant deterioration of both the interest spread and the quality of the debt portfolio. Higher interest rates then caused real estate prices to collapse and, ultimately, triggered the savings and loan crisis. In that same era, crises in Japan and the United Kingdom by and large followed similar patterns.

A more recent example concerns the Scandinavian banking crisis. During the first half of the 1990s, nearly all the major Nordic banks got into serious problems as a result of large loan losses. Previous to that period, lending increased rapidly because of deregulation and

[96] It did not lead to a banking crisis, because mortgage banks were taken over by insurance companies and banks.

liberalization, favorable tax regimes, economic prosperity, and increases in asset prices, causing huge increases in collateral values. When the asset price bubble finally burst, it was the loss of international confidence that ultimately triggered the crisis (a large part of the Nordic banks' funding originated from abroad). However, many analysts regard the excessive lending growth in the late 1980s, associated with reckless lending terms, as the principal reason for this problem to occur.

In terms of stability conditions, the retail market is also special in the sense that retail depositors lack time, skills and information to properly assess the solvency of their banks. The inherent risk is that a significant deterioration of a bank's solvency may go unnoticed for such a long time that retail depositors can only react when it is already too late. Therefore regulators have a task to protect households by deposit guarantees.

In the future, the European Commission and The Basle Committee want to facilitate monitoring of the solvency of banks by introducing the so-called fair value accounting. This methodology would fully comply with the rules set out by the International Accounting Standards Committee. It implies that all financial assets (and some of the financial liabilities) will be valued at their real value, rather than their historic one. As such, the introduction of fair value accounting may better enable retail depositors to monitor the behaviour of their banks and allow depositors to react in time if solvency would reach dangerous levels. However, opponents claim that fair value accounting will actually increase instability. This accounting method will lead to large fluctuations in the value of assets and profitability that will ultimately undermine confidence in the banking industry. The large fluctuations, which previously went unnoticed by the public, could easily be wrongly interpreted as financial shocks and thus create unnecessary panic amongst retail depositors.

Other trends are likely to diminish the impact of shocks. For instance, the rapid developments in information and communication technologies may create new economies of scope for retail banks. Due to increased opportunities for transport, storage and processing of data, banks become more able to effectively use their (client-specific) information and offer their clients tailor-made services based on their revealed preferences. Furthermore, these developments will allow banks to collect large amounts of external data and apply more advanced statistical methods and techniques in managing their risk portfolios. Further advancement in credit-scoring systems, designed to overcome the chronic problems of information asymmetries in the industry, will be the most significant development in this regard.

These developments will positively affect stability. Provided that the risks in different markets are not perfectly correlated, exploiting new economies of scope would make banks less sensitive to exogenous shocks. Although diversified banks may be hit by shocks more often, the overall risk will still decrease. Naturally, improvements in risk management systems only reinforce this development.

5.2 What are the relevant retail markets?

The following step (step 2, see section 4.2) is to assess the impact of increased competition on stability. To make that step we first need to analyse relevant markets (this section) and competition issues (next section).

Retail banking concerns payment services, credit lending, and savings and investments services offered to private clients. These services are consumed by both small and medium-sized enterprises (SME's) as well as households. For most of the analysis this chapter concentrates on households, who are most vulnerable to asymmetries in information. However, on the credit market special attention is paid to SME's. Because of the non-standardisation of products on this market, SME's are particularly vulnerable to intransparency.

Five large players capture the bulk of the Dutch retail banking market, i.e., ABN AMRO, Rabobank, ING (including the Postbank), Fortis and SNS. They are active on all the various relevant markets within retail banking, albeit in various degrees.

The following product categories can be distinguished within the market for retail banking:

- Payment services: current accounts and credit cards
- Credit loans: consumer credits, mortgage finance, SME credit
- Savings and investments: savings accounts and investment funds

Complexity arises from the fact that in some cases this functional dimension is the relevant market to consider (current accounts for SME's and households can be in the same market), while for other situations the consumer type determines the focus (credit for SME's being a different market from household credit). Finally, also the distribution outlet can be the critical factor (customers possessing a PC with modem or not). The relevant geographical market for household services is (almost always) local.

While acknowledging various important links between product and customer groups, we usually think of a relevant market as comprising of one product in one local market to one type of customer (typically households). So when we talk about 'competition' we mean competition on a particular relevant market. When we talk about 'stability', though, the relevant frame is a bank or a system rather than a relevant market. To further narrow down the scope, we will ignore interesting but rather specific discussions on Chipper (debit cards) and Interpay (payment settlement) in this study.

5.3 What are the competition issues in Dutch retail banking?

This section determines for three main product groups (i) what the competition issues are and (ii) what the impact of trends on competition is.

Payment services

Although banks usually offer very low real interest rates on current accounts, still this service is often referred to as a loss making activity. As a result, more and more consumers are directly charged for tranactions costs. Most banks consider current accounts essential, as they form the core of the client relationship. Apart from providing liquidity for banks, current accounts allow for cross-selling other, profitable financial products. For instance, banks could offer favourable terms on one product when it is bought in conjunction with others, or require clients to buy a collection of products when they really want only one of them. If current account services are indeed only profitable in combination with other financial services, any player on this market will have to offer a broad range of products and will hence have to enter at a large scale. Such integrated entry is of course much more complicated than entering only a single market, and therefore constitutes an important entry barrier in the market for payment services. We conclude that it is not likely to consider current account as a loss-leading sub-market, if one takes account of the full economic value of the service.

Another entry barrier is the high switching cost for account holders. Currently, switching suppliers necessarily implies a new account number. Obviously, this results in a lot of paperwork, as all the client's financial relations will have to be informed. It is therefore very hard for new banks to attract customers from the existing client base of incumbent banks. Naturally, these high switching costs also hinder competition between incumbent banks.

The lack of reputation and a well-known brand name, perceived indicators of quality, provide additional problems for greenfield entrants. This holds for any market, of course. In a sector that thanks its very existence on confidence, reputation is the single crucial asset of a bank. Building up a brand name requires substantial expenditures in advertisements and public relations that cannot be recovered in case of exiting the market. These sunk costs hence constitute another entry barrier in the market for payment services. Partly, the necessity of having a good reputation may stem from unfamiliarity with deposit guarantees. If consumers are unaware that, up to a certain limit, their deposits are warranted, they will be reluctant to transfer money to new and unknown banks.

The market for payment services further suffers from a lack of transparency. In the current situation, consumers can hardly know the true costs of their current account services. For instance, how much time is there between the moment that a bank receives a certain payment to a client and the moment this money enters the client's account? This lack of transparency hinders competition as well, since households cannot easily compare payment services of different suppliers.

More of technical nature is the market frictions related to international payments. Compared to domestic retail payments, fees are substantially higher and execution times much longer for cross-border payments. It is already hard to understand why the transfer of money (even if it is done electronically by the clients themselves) takes days to effectuate in a national context.

Internationally, there exist more explanations. Part of the explanation can be found in the sluggishness of banks in standardising their customer interfaces and automating their internal systems and procedures for international retail payments. These high fees impede competition from foreign financial institutions as well.

Payments by credit cards are an alternative for cross-border retail payments in particular. The market for credit cards differs from the market for current accounts in that the former is fully dominated by international players. In other respects, the market for credit cards more or less resembles the current account market in terms of competitive conditions. Especially the need to enter at a large scale and the high sunk costs needed to obtain a well-known brand name constitute high entry barriers in the market for credit cards. In addition, this market is characterised by substantial network externalities.

In short, high sunk costs, low transparency, and high switching and transaction costs currently characterise the Dutch market for payment services. And given the high entry barriers, it is not surprising to see that the Dutch market for payment services is highly concentrated (see also box below). ABN Amro, Rabobank, and ING together already capture more than 80 percent of the market, and besides Fortis and SNS, no other banks are active in the Dutch market for payment services.

So far, we described market structure and product characteristics. These characteristics indicate that there are reasons to be wary of competition in the retail market. It does not prove that there is weak competition in the Dutch retail market. Are there indicators that can point at this (or the opposite) direction? The box below provides some insights but no conclusive evidence of weak competition. However, the evidence presented in these studies points in the same direction.

How do trends influence competition? A number of technological and institutional changes are likely to alter the competitive conditions in the near future. First, sunk costs may decrease through the emergence of remote banking, as banks will no longer need an extensive branch network to offer their payment services. The emergence of remote banking will also make it much easier to open an account at another bank.

Second, transparency might improve as well. The Dutch Council of Financial Supervisors, for instance, is currently working on directives on the type of information that financial institutions must supply to the public. For payment services, the information could, e.g., consist of the execution time that banks need to complete a transaction.

Evidence on levels of competition in Dutch retail banking

Apart from circumstantial evidence provided by market structure and product characteristics , is there any empiricial evidence on the level of competition in the Ducth retail banking? We have found six sources. Some of these sources are broader than just the retail market (but include the retail market):

1. Punt and Van Rooij (1999): Among a set of eight major European countries, the Netherlands show the highest market concentration in commercial banking. The Herfindahl index equals 0.16 for the Dutch banks, compared to an average of 0.04. The collective market share of the five largest Dutch banks is equal to 79 percent, more than twice as high as the 36 percent average value. (Data source: BankScope Period: 1992-1997).
2. Bikker (1999b): Using the sum of input price-elasticities as an indicator of competition, Bikker shows that the Netherlands exhibits the lowest level of competition within the European Union and the highest level of market concentration (again C5, which equals 84 percent in 1995).Data source: Fitch-IBCA Period: 1992-1996.
3. Sander and Kleimeier (2001) argue that: "...concentration is especially high in smaller countries such as Finland, the Netherlands, or Belgium where the two largest groups account for more than half of the market.".
4. Dietzenbacher et al. (2000) find evidence for the hypothesis that cross-shareholding adversely affects competition in the Dutch financial sector. Compared to no-shareholding, cross-shareholding increases price cost margins by 2 to 8 percent.
5. Toolsema (2001b) has used a structural estimation approach to assess the (average) degree of market power in the market for consumer credits. She finds no evidence of market power. Leaving estimation issues aside, this result should not be generalised to the whole Dutch banking sector, since the market for consumer credit is only a small submarket. As multiproduct firms, banks can cross-subsidise low-return or loss-making activities through income from more profitable submarkets. To assess the degree of market power in Dutch banking, a fuller set of markets has therefore to be considered in future work.
6. Cruickshank (2000): In an extensive review of the UK banking sector, the Cruickshank report concluded that in all submarkets considered (money transmission, services to personal customers and services to SMEs), competition is not effective. Given the resemblance of the UK and Dutch banking sector, competition problems may well be present in Dutch retail banking as well.
7. Expert opinions / estimates in Boot et al. (2000). Market share largest four in (for NL):

Payment services households	93 %
Consumer credits	90 %
Mortgage finance	79 %
Payment services and credit/mortages loans SMEs	97 %

A few translated quotes from Boot et al. (2000):
“Big Dutch Banks are fully aware of multimarket contacts. Interviews generated quotes such as 'If our bank steals away one percentage point of market share in one market, we expect an instant retaliation in another segment.' This awareness weakens competition.” pp. 64
“A recent study on the quality of information yielded clearcut results: the information quality differed wildly, was usually incomprehensible, and customer awareness of their rights, the rules, laws and supervision was very low.”p58
“There has not been any recent entry in this ‘untouchable’market for three reasons: reputation, high swithing costs and loss-leading strategies. High switching costs make clients vulnarable for any-competitive actions.”p74

Third, the Dutch Ministry of Economic Affairs is planning to investigate the effects of account number portability. Introducing portability will greatly reduce switching costs and thus improve competition in the market for payment services. The feasibility of this option is illustrated by recent attempts by ECBS (European Committee for Banking Standards) and IPI (International Payment Instruction). The ECBS has published a standard on a harmonised European account number structure called IBAN (International Bank Account Number). The aim is to have IBAN in general use in Europe by the beginning of 2002. Similarly for IPI that will be attached to the invoices that companies involved in international trade will receive in the near future. Number portability is often critized (mainly by the sector itself). Allegedly it is expensive, and consumers do not want to switch. These arguments fall short: the costs are a one-off investment, and the fact that consumers do not want to switch can never be used to maintain switching costs. Maybe they do want to switch if switching costs are lower and price competition is fiercer.

Fourth, the European Central Bank has recently undertaken action aimed at removing the obstacles that are held responsible for the inefficiency of cross-border retail payments. Finally, new payment facilities can increase the number of substitutes for ordinary retail payments.

Credit loans

Compared to payment services, the Dutch market for credit loans involves many more active players. Besides the larger banks, a number of chain stores, specialised institutions (e.g., De Hypotheker, Frisia and DSB) and credit card providers alternatively supply consumer credits and mortgages. But despite the presence of these alternative suppliers, the large banks still capture the bulk of the market, in particular Postbank en Rabobank. Apparently, small and unknown suppliers suffer from a legitimacy problem, creating a competitive advantage for the large and established banks in providing consumer credits.

Since differences in conditions of consumer credits are rather easy to compare, transparency is fairly high in this market. Besides the interest rate, only the premium for the usually required life insurance might be an issue. Transparency is much more of a problem in the much larger market for mortgage finance, though. This is largely due to the high levels of product differentiation and the considerable complexity of real estate finance. Several types of mortgage loans exist, where each type is a complicated mixture of conditions regarding duration, interest schemes, risk and life insurance. As most consumers take out or negotiate a mortgage loan only once or twice in their lives, and given the size and complexity of these loans, personal advice is considered to be highly important in this market. Yet, also the market for financial intermediaries is intransparent (see, e.g., De Laat et al., 2000).

To some extent, the need for personal advice hinders alternative distribution channels, such as the internet. On the other hand, more transparency might reduce the need for advice. If banks are required to provide information that would reduce the complexity of mortgages and

that would allow for fair comparisons between various mortgage loans, the internet might well become a serious alternative distribution channel.

The Bank of Scotland has already undertaken the first step in this direction. It has recently entered the Dutch mortgage market and started offering mortgage loans through the internet without charging any commission. As legal entry barriers are rather low, competition in this market is already relatively strong. Entry through the internet would spur competition even further.

Entry barriers are much higher in the market for credit loans to small and medium sized enterprises (SME's). Compared to lending to households, lending to SME's is a lot more complicated. The number of relevant parameters to assess the credit risk, as well as the uncertainty regarding the levels of these parameters, are much higher. Hence, in order to estimate the risk profile properly, bank managers will have to have detailed knowledge about the firms applying for loans. Since this knowledge about banks' clients can only be built up over time, entering banks are strongly disadvantaged here. Furthermore, as this market is mainly local, new suppliers will have to locate at close physical distance to their clients.

None of the trends is likely to substantially change this situation in the future. The geographical dimension will not be increased through alternative distribution channels. Banks are not likely to offer credits to SME's via the internet, as the information they will need to assess risk is to a large extent tacit. Credit scoring models are therefore difficult to apply. Only by personal contact banks will obtain sufficient information to base their decisions on. Number portability will not really help either, as a large part of the relevant information for granting current account credits cannot be transferred due to its tacit and/or private nature.

Savings and investments

The market for savings and investments is also characterised by a very high degree of product differentiation. Apart from the standard saving accounts, a wide array of savings and investments products are available for households' financial surpluses. Besides price competition, banks compete mainly on the terms and conditions underlying their products. Although this leads to many product innovations, it does not contribute to the transparency of this market. The lack of reputation and a well-known brand name are again important entry barriers. In terms of market structure, the Dutch market for savings and investments bears a close resemblance to the market for credit loans. The number of players is fairly high (think of DSB, OHRA, Spaarbeleg) , yet the universal banks still dominate the market.

Especially in this segment the various trends can be expected to have a large impact on competitive conditions. The larger availability of financial information through the internet significantly reduces search costs. In fact, a number of websites have been developed with the aim of accommodating direct comparisons between different providers. As such, these developments positively contribute to the transparency of the market for retail banking. Further,

the emergence of remote banking will increase the mobility of deposits, as transferring money from one savings account or investment fund to another will take much less time and paperwork than before.

Multi-market contact

Since the large banks are active in all segments of the retail market, competition may also be adversely affected by multi-market contact. According to the linked oligopoly theory, the incentives for a bank to behave aggressively towards its competitors in any single market are lower when these competitors have the opportunity to retaliate in multiple common lines of business. More precisely, if the expected effect of profit-increasing aggressive action in one market is less than the expected effect of profit-decreasing rival retaliation in other markets, banks will act less aggressively as they would have in absence of multi-market contact. Clearly, the conditions for multi-market contacts are met in the Dutch retail banking market.

Conclusion

To summarize, high sunk costs, low transparency, high switching costs and multi-market contact constitute the most important factors limiting competition in the Dutch market for retail banking. Not only do these factors raise entry barriers for particularly *de novo* entrants, they also hamper competition between existing banks.

Various trends are likely to substantially increase transparency and decrease switching, transaction and sunk costs in most markets considered, with a noticeable exception of the market for credit to SME's. Most of the trends therefore seem to directly stimulate competition in retail banking. For instance, by means of increased transparency, consumers become more aware of price and quality differences. Further, the larger availability of financial information improves consumers' financial literacy and thus reduces the asymmetric information problem. Combined with lower switching costs, these developments may very well increase demand elasticity and customer churn.

Competition is further spurred by the emergence of new distribution channels, such as the internet. These new distribution channels increase the relevant geographical market, as physical proximity between a bank and its clients is no longer required. As the relevant geographical market increases, the number of banks directly competing with each other naturally increases as well. Through remote banking, foreign banks may well start competing with domestic retail banks. Further, as entrants no longer need an extensive branch network to offer their retail services, one important entry barrier (i.e., the necessity to enter at a large scale) will disappear as well.

5.4 Effects of more competition on stability

The previous section showed the potential for intensified competition in various relevant markets. Step two of the four-step procedure (see section 4.1) asks the question: How does increased competition affect stability?

Competition and market failures underlying instability

Increased competition can lead to instability for four reasons:

- Indivisibilities/excess capacity: optimal scale can be distorted by competitive forces, leading to excess capacity and increased risk taking
- Credit risks: fierce competition can imply that firms, in particular entrants, take excessive credit risks in order to obtain clientele
- Entrants with risky profile: entrants with risky profiles can offer higher rates, but endanger stability
- Asset bubbles: increased competition in mortgage fees can lead to an asset bubble. A burst of the bubble destabilises the economy

More competition may stem from two sources. First, new players could enter the market for retail banking. These new players can be *de novo* entrants, or financial institutes that have been active in other geographical or product markets. Second, more competition could arise because of greater rivalry between incumbent banks. The most important difference between the two is that in the former, the whole market must be divided over a larger number of competitors. Hence, at least one incumbent will lose market share. Naturally, in case of stronger competition between incumbent banks, market shares do not necessarily change.

Generally, more competition will lead to lower profits. The most direct way in which this happens is through a smaller spread between deposit and loan rates. However, if more competition originates from successful entrants, production volumes of incumbent banks may go down as well. Consequently, a part of the incumbents' capacity becomes redundant. Furthermore, in case of indivisibilities (in the production technology) these decreasing volumes also lead to higher average fixed costs, suppressing profits even more. Indivisibilities in the transformation function of retail banks would, in case of market share erosion, adversely affect the banks' risk profiles as well.

Especially in the short run, the combination of falling profits and excess capacity could make banks lower their safety standards. In attempting to retain profitability and capacity utilisation, bank managers may start to issue credit and mortgages loans under much less stringent conditions (for corporate governance see chapter 6) . Stronger competition, in particular when it stems from successful entrants, may therefore stimulate imprudent behaviour and lead to excessive lending (see Davis, 1995).

Besides creating more incentives for imprudent behaviour, more competition may also affect the market failures that provide the scope for excessive risk taking in the first place. Regarding the externalities of bank defaults, competition will not change anything as long as the banks at issue are still large. But the smaller the banks, the smaller the difference between private and social cost of a bank default and the less the "too big to fail" argument for moral hazard applies. Hence, in this context and in contrast to the previous paragraph, more competition from successful entrants would lead to less scope for excessive risk taking.

With regard to the other market failures that create the opportunities for imprudent behaviour to occur, no positive or negative effect of competition can be expected. The level of asymmetric information will not be affected, and, as long as deposit guarantees remain, moral hazard and adverse selection by households will not change, regardless of the intensity of competition.

In conclusion, by stimulating the incentives for excessive risk taking, sharp decreases in profitability in combination with rapid increases in excess capacity probably provide the largest adverse impact of competition on stability. The scope for imprudent behaviour will, at least in the short run, not be diminished by more competition.

Competition and shocks

In what ways can more competition lead to a higher number, impact and propagation of exogenous shocks? To start with the frequency of shocks, there is no reason to believe that more competition in retail banking would increase the number of truly exogenous shocks, However, the impact of exogenous shocks can certainly be affected by stronger competition. For instance, due to competition banks may have become more willing to grant loans to households for financing their risky investments in securities. A sudden collapse in asset prices would then immediately hit the solvency of banks. Lower capital reserves due to lower profits constitute another example of how competition could affect the impact of a shock on the solvability of banks. High levels of retained profits would make a bank more resistant to exogenous shocks and as such prevent the bank from collapsing. More competition, coming from either entrants or incumbents, might easily erode these financial buffers and thus make banks more sensitive to exogenous shocks.

Next, we discuss the impact of competition on the propagation of shocks. Shocks spread out through the financial system through failures to settle in the payments system, through panic runs following the revelation of one or more institutions' problems, or through falling prices, liquidity problems, or markets failing to clear when large volumes of securities are offered for sale simultaneously (Berger, DeYoung, Genay and Udell, 2000). Obviously, the larger the institutes involved, the stronger these mechanisms apply. The effect of increased competition then again depends on its impact on the average size of the retail banks. Therefore, more

competition stemming from entrants diminishes the propagation of shocks, whereas more competition between incumbents will have no effect in this context.

Summing up, the largest threat of stronger competition in relation to exogenous shocks lies in the stronger impact that shocks might have on the solvency of retail banks.
Finally, in assessing the impact of increased competition on stability, we should naturally take into account that a sudden and sharp increase in competition might be a shock in itself as well. As mentioned before, especially when successful entrants cause such a sharp increase in competition, profits may quickly erode and capacity may rapidly become redundant as incumbents lose market share. And it is this particular combination of events that may give rise to excessive lending and to a larger impact of exogenous shocks.

5.5 Three hypothetical examples

To illustrate, we elaborate three hypothetical examples, one in payment services, one on the mortgage market, and one in SME's credit provision. With these examples, we aim to indicate how competition may increase, how this can affect stability, and what policymakers could do. The examples are not forecasts of what will happen, but, rather, possible scenarios of what might happen.

Example 1: Payment services
The market for retail payment services is highly concentrated and embodies many features of a tight oligopoly. Suppose now that a newly raised retail bank, fully exploiting the technological opportunities of the internet, starts an aggressive advertising campaign and, in order to quickly penetrate the market, offers attractive interest rates on current accounts and low interest rates on current account credit loans. In addition, the regulating authorities try to stimulate competition by introducing account number portability and by forcing banks to provide more clarity about their conditions.

Being aware of the unfavourable conditions of their current banks, knowing that their current account deposits are insured anyway, and encouraged by account number portability, households massively transfer their funds from the established banks to this unknown newcomer. Its credit customer base skyrockets as well, and includes a number of households that received no credit facilities on their current accounts at the established banks.

As the entrant is able to take away customers from the incumbents, excess capacity arises. In order to retain market share and to utilise idle capacity, the existing banks start to accept lower interest spreads as well. Further, they lower their prudential standards too, which significantly deteriorates their debt portfolio. All together, the retail-banking sector becomes highly sensitive to shocks.

In this example, the trigger could be the default of the entrant. It had been able to get a large market share, but only at such high costs that eventually it went bankrupt. As the incumbents' financial buffers have been eroded, the failure of the entrant rapidly propagated through the industry (e.g., by bank runs), and the crisis has become a fact. All these changing environments, identities of firms and prices also reduce consumer confidence in the banking system as a whole.

Suppose we would like to enhance competition in the payment services. How to avoid this type of crisis? One way to deal with excess capacity is to allow banks to merge with other banks, as mergers and acquisitions generally make it easier to coordinate the reduction of the industry's capacity. Another market based means to pre-empt a crisis is through corporate control. Especially when banks exhibit excessive risk taking in credits, effective corporate governance is of utmost importance (see also chapter 6).

But effective prudential supervision by regulators constitutes a natural instrument to prevent such a crisis as well. In this example, both the entrant and the incumbent engaged in risky activities by relaxing their current account credit limits. Stimulating competition through relaxing prudential regulation, and thereby attracting bad entrants, may have strong adverse effects by encouraging such reckless behaviour. Notice that de novo entry has a higher potential for instability than increased competition between incumbents. Notice also that it is advisable to phase out institutional changes, such that they will not create a competitive shock.

Example 2: Mortgage loans

Suppose that a foreign bank starts to offer mortgage loans directly to households via the internet. Because of a much higher cost efficiency, it can offer interest rates and provision fees that are significantly lower than those of the established banks. Think of the Bank of Scotland, but much bigger and much more aggressive. Due to increased transparency and reduced complexity (both stimulated by government regulations), consumers are well aware of the favourable conditions of the entrant. Therefore, as in the previous example, the entrant is able to obtain a significant market share.

Incumbents, again faced with excess capacity, cannot compete on interest rates (due to their higher costs). Instead, they enlarge the size of the loans they are willing to grant up to risky levels (given the households' income levels and the liquidation value of the collateral). As more and more consumers take larger mortgage loans, real estate prices take off so rapidly that a speculative bubble emerges. As the historical examples of section 5.1 have shown, such a situation can easily lead to a crisis, e.g., through a sudden increase in interest rates.

Strict prudential regulation may again have avoided instability here. Although in this case the entrant behaves orderly, it is the incumbents that relax their safety standards to hazardous levels. Hence, by keeping prudential regulation strict, the regulating authorities help to avoid instability. Furthermore, in this way they would also urge the incumbent banks to reduce their

X-inefficiencies by leaving them no other choice than to reorganise their business models. Ultimately, the market for mortgage loans may then have become more competitive without having adversely affected stability conditions. In particular a strict control on misleading information and advertisement is called for. Currently there is hardly any supervision on misleading information on mortgages. Possibly the new 'financiële bijsluiter' (an instrument that protects consumers on complex financial products) that the regulators are about to launch, can help here. Although the principle aim of the 'financiële bijsluiter' is to protect consumers, a side contribution can be that it enables higher competition without jeopardising stability. Transparency cuts both ways here: it decreases consumer search costs and also makes the life of regulators easier.

Example 3: Credit loans to SME's

A well functioning market for credit loans to SME's is indispensable for dynamic efficiency of the economy. In many markets, innovative SME's are the engine of economic growth. Good functioning of the SME credit market implies, among other things, that banks filter out the good and bad loans. If the market functions in a suboptimal way, banks can afford to only provide loans to firms with an excellent risk profile. This implies that other firms encounter difficulties in obtaining credits, although it is socially beneficial if they obtain the credits. Venture capitalists are active in some submarkets (e.g., in ICT) but for a lot of SME's these funds are inaccessible. Suppose that the market is not functioning well, that SME's have limited choice, i.e., only their current bank is eligible, as other banks have no access to the firms' track records. How can we increase competition and will such an increase in competition endanger stability?

First of all, assume that the regulators introduce account number portability. Because most firms take all their financial services from one bank, number portability will extend the choice set of credit institutions for SME's as well. Secondly, suppose the regulators transfer the property rights of firms' track records to the SME's. Developments in ICT help here: more and more firms use remote banking, with which they automatically build up a database containing all their past financial transactions, sharply reducing the screening costs.

But credit risk assessments can only partly be based on codifiable information. Tacit knowledge remains crucial for accurate risk estimates. Further refinements in credit-scoring models applied at consumer lending can therefore hardly be used in the market for credit loans to SME's. Furthermore, this market is characterised by the importance of personalised contacts (relationship lending) and a reluctance of SME's to change their longstanding relationships with banks. From the box on “competition reduces market failure” in section 4.2, we conclude that interbank competition can help solving this problem.

So our starting position is one where incumbents only cater the good risk SME's, leaving a welfare gain to be realized by filling the medium risk niche. ICT and number portability reduce

screening and switching costs there. So let us suppose that banks that are specialized in e.g. start-ups enter this SME niche. There are two stories now. Story one is the good story: the niche is filled by the entrants, and welfare improves, since entry is not associated with instability. Story two involves instability. Competition for the niche is fierce, credit providers do not want or are not able to sharply distinguish between medium and bad risks, leading to an increase in bankruptcies.

This hypothetical example shows that increases in competition in the market for credit loans to SME's should be carefully introduced. New SME's inherently suffer from information problems that can only be partially solved by technological or regulatory change. More competition can be particularly effective if indeed there are substantial medium risk niches There is some evidence for that in the Netherlands. In an extensive survey, De Haan et al (1994) concluded: "Indeed a significant number of firms in the survey attribute their preference for internal funding to credit rationing and/or the expensiveness of external finance". The increasing activities of venture capitalists are another indication that this is indeed the case. If, on the other hand, only bad risks are left, if competition for medium risk becomes very fierce, or if it is simply too costly to distinguish between medium and bad risks, the costs of competition (in the form of instability) can outweigh the benefits.

5.6 Conclusion

Structural market characteristics and empiricial evidence clearly point out that the benefits of competition in Dutch retail markets are not fully exploited. Trends point towards more competition in most retail submarkets. Can increased competition go hand in hand with stability or is special regulation required?

Three hypothetical examples showed some of the dangers of too intense competition in the markets for deposits, mortgage and SME credits. The main threat in the deposit market comes from de novo entry, with two dangers: excess capacity of incumbents and excessive risk taking by entrants. The mortgage danger lies with the possibility of an expanding market leading to an asset bubble. In the market for SME's fierce competition can lead to bad loans provision.

What can policy do to avoid these dangers while still keeping the benefits of increased competition? In all circumstances increased competition stresses the importance of prudential regulation. In addition to that we come to two general lessons:

Lesson 1 Corporate governance and *de novo* entry

Intensified competition, in particular from *de novo* entrants, stresses the importance of corporate governance. In a competitive environment, bad corporate governance puts too much weight on prudential regulation to maintain stability. When new firms enter the market for deposits, mortgages or SME credits, the main threat is that they take excessive risks or

incumbents take excessive risk as a response to entry. Good corporate governance prevents managers to pursue goals that are not in the long-term interest of the firm.

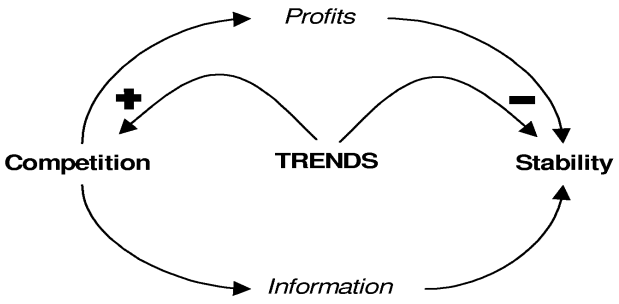
Lesson 2 Intensified competition between incumbents

Most instability dangers are associated with entry. Intensified competition between incumbents does not suffer from most dangers and should therefore be encouraged, e.g. by enforcing number portability, increasing transparency and limiting cross-shareholdings between competing firms.

6 Corporate governance and banking

Internationalisation as well as technological *and* financial innovations have intensified competition in banking recently, forcing banks to revise strategies and adapt organisational structures. Competition puts banks under pressure by reducing profits and thus net worth which buffers against shocks. To make up for lost business and shrinking profits managers may embark on riskier strategies, especially if their remuneration is performance-based. With competition the risk of bank failure is raised directly via reduced profits and indirectly via excessive risk taking. Systemic stability may be at risk if bank failures become contagious and propagate. However, the implied trade-off between competition and stability is not straightforward. Rather than destabilise the system, increasing competition can bolster stability. As convincingly argued by von Hayek (1945, 1968), competition is an efficient and effective procedure of discovery. In particular, competition reveals, condenses and utilises dispersed or latent information, thus overcoming divided knowledge.[97] As the potential for market failure in banking very much results from informational problems, competition fosters stability by exposing inefficient and badly performing banks. Competition provides investors with benchmarks of efficiency and productivity against which the management and performance of individual banks can be checked. Figure 6.1 illustrates the two-channel impact of an increase in competition on systemic stability.

Figure 6.1 The competition-stability relationship



A core interest of corporate governance is to design incentives and control mechanisms such that adverse incentives, as, for example, managers taking excessive risks and thus putting the firm at stake, are eliminated or avoided. Some scholars have argued that competition itself is the best governance mechanism because it weeds out inefficient market players with ineffective

[97] See Makowski and Ostroy (2001) for discussion.

control structures. In the following, we discuss how the governance of banks may influence the relationship between competition and stability.

6.1 What is corporate governance?

Shareholders v. stakeholders as residual claimants

In a narrow definition, corporate governance refers to the formal system of mechanisms that make a firm's managers accountable to the firm's owners and force management to pay out a dividend as a reward for the owners' capital investment. This narrow view is known as the "shareholder model".[98] It attributes to the firm's owners the residual control right, and thus the obligation to supervise managers. The firm's core objective in this corporate governance approach is the maximization of shareholder value.[99] A firm creates value and generates wealth not only for the shareholders, but for everybody who has invested in it, as, for instance, its employees who provide their human capital. In a broader definition, corporate governance then describes the whole network of formal and informal relations between management, shareholders and stakeholders (e.g. employees, creditors, suppliers, public authorities, communities) in which the corporation is embedded. The literature refers to this broader view as the "stakeholder model". Corporate governance is "the design of institutions that induce or force management to internalise the welfare of stakeholders." (Tirole, 2001, p. 4) In this view, not only the providers of equity capital, but all parties with a financial or non-financial stake in the firm, have residual control rights and should supervise managers. The core objective of this approach is then that managers, who themselves are stakeholders, seek to maximize stakeholder value. The choice of corporate governance mechanisms, as reflected in ownership arrangements and managerial incentive schemes, is not a once-and-for-all decision but an organic process. As emphasised by Mayer (2000), corporate governance is "much more than just the efficient running of firms in the interests of its investors; it is the determinant of what the firm is and does." [italics added] In this definition corporate governance reflects the firm's purpose and goals. As those change over time in response to changes in the market environment, so governance structures have to be adapted.[100]

Market-based v. network-oriented financial systems

The normative question of which of the above models of corporate governance is more appropriate to solve agency conflicts and improve corporate performance is being actively

[98] See e.g. Short (1994), Shleifer and Vishny (1997), Allen and Gale (2000c, ch. 2 and 3), Tirole (2001) for surveys and references.

[99] See Rappaport (1986).

[100] See Rajan and Zingales (2000) for a similar view.

debated.[101] The answer to the positive question of how these models reflect real-word corporate governance arrangements is closely related to the overall design of the financial system. Two systems of corporate finance are traditionally distinguished in the literature: the market-based Anglo-Saxon system and the network- or bank-oriented system which is characteristic for Continental Europe and Japan.[102] To avoid any misunderstanding: This distinction does not mean that one system has elements which the other one does not have. Rather of interest is the difference in emphasis put on elements which both systems share.

The Anglo-Saxon system relies very much on the market mechanism to channel funds into its most productive uses. Therefore, financial markets for equity and debt are highly developed (capitalized), liquid and innovative. Stock-based corporations are very frequent in Anglo-Saxon countries. Active markets for corporate control exist which allow for takeovers through outsiders, putting pressure on firm managers to perform.[103] By contrast, in Continental Europe financial markets are still underdeveloped. Hostile takeovers are of rare occurrence, not the least because intricate spider web-like ownership arrangements (cross-shareholdings and pyramidal arrangements) among banks, insurance companies and non-financial firms often effectively thwart incipient desires of potential raiders.[104] It comes as no surprise that the shareholder model of corporate governance has been identified as representative of Anglo-Saxon corporations, whereas the stakeholder model seems a more appropriate description of Continental European corporations.

Solving conflicts of interest

Ownership arrangements (ownership structures, board representation, location of control rights) and incentive-compatible remuneration of managers are important mechanisms of corporate governance to cope with informational problems and mitigate principal-agent conflicts which lead to economically inefficient market outcomes. A main concern of the corporate governance debate is that public companies with widely dispersed shareholdings and short-term oriented (myopic) owners may be prone to sub-optimal monitoring by shareholders. The incentive to monitor managers and take action in case of underperformance is low for a shareholder who only holds a tiny fraction of a firm's equity. Monitoring and effort costs usually exceed the shareholder's individual benefit from tightening governance. Moreover, other shareholders can free-ride on individual effort, that is, they benefit without sharing in the incurred costs. This free-rider problem makes it unattractive for small shareholders to exercise and enforce voting rights. Managers may then enjoy substantial residual control rights and

[101] See Rajan and Zingales (2000), Hellwig (2000), Tirole (2001) for more discussion.

[102] See Allen and Gale (2000c, ch. 2 and 3) for a most recent overview of the financial systems in the USA, UK, Germany, Japan, and France.

[103] See Manne (1965), Jensen and Ruback (1983) and Jensen (1988) on the market for corporate control.

[104] We will provide two examples of such "spider-web" designs below.

pursue their own interests undisturbed by shareholders (Berle and Means, 1932).[105] Although wide dispersion of voting capital makes the formation of shareholder coalitions difficult, well-functioning and highly liquid stock markets may allow individual investors or investor groups to buy up shares and establish voting blocks which in control contests may seriously challenge incumbent management. However, the free-rider problem also impairs this disciplining effect of a takeover threat, particularly since incumbent managers have a host of anti-takeover strategies at hand to defend their positions.[106] Therefore, effective corporate governance through shareholder initiative can only be expected if the free-rider problem is solved.

Concentrated ownership, i.e. the presence of large shareholders, has been suggested in the corporate governance debate to remedy the free-rider problem and restrict managerial discretion and managerial entrenchment.[107] A large shareholder has concentrated her investment, thus carrying more risk by forgoing opportunities for portfolio diversification. Having more at stake, a large shareholder has a stronger incentive to monitor management and push managers to maximise the return on her investment than any minority shareholder. As a large shareholder commands cumulative voting power, she can hardly be ignored by the management. Empirical evidence suggests that even the largest commercial banks, which are typically listed and traded on stock exchanges and have thousands of shareholders holding negligibly small stakes, are controlled by small groups of relatively large shareholders, often through cross-shareholdings.[108]

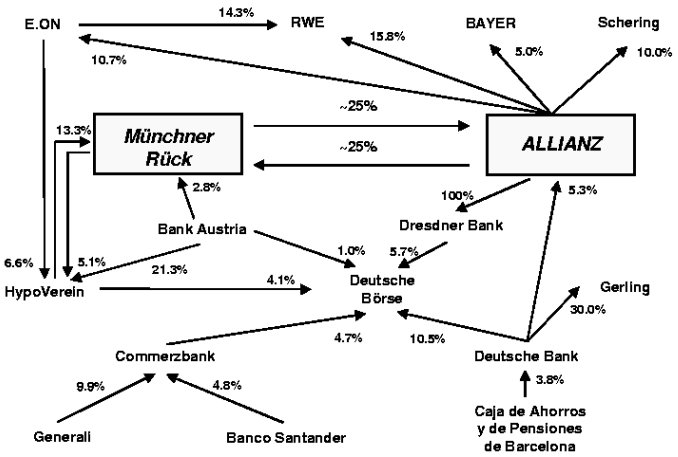
[105] Expansion and diversification are frequently listed as managerial objectives which may conflict with shareholders' or debtholders' best interests (Kaplan and Weisbach, 1992).

[106] See Grossman and Hart (1980) on the free-rider problem with regard to hostile takeovers. See Stulz (1988), Shleifer and Vishny (1988), Jensen (1988), Fluck (1999) on anti-takeover defenses and entrenchment strategies.

[107] See e.g. Cubbin and Leech (1983), Shleifer und Vishny (1986, 1997), Huddart (1993), Admati et al. (1994), Strickland et al. (1996), Loderer and Martin (1997), Maug (1998), Pagano and Röell (1998), Bolton and von Thadden (1998a,b), Becht (1999), Boehmer (2000), Lehmann and Weigand (2000), DeYoung, Spong and Sullivan (2001).

[108] See Dermine (1990), Charkham (1994), Edwards and Fisher (1994), Walter and Smith (2000). For example, by the end of 1999 Deutsche Bank, Europe's largest commercial bank, had 538.548 shareholders and 614.3 million of shares, of which 55% belonged to other institutional investors and companies, 22% by insurance companies, 12% to employed persons and pensioners, and 11% to other private persons. Until recently, about 15% of Deutsche Bank's equity was held directly or indirectly by Allianz, one of the largest European insurance companies. At the same time, Alllianz held a 22.5% share in Dresdner Bank, one of Deutsche Bank's competitors. Both banks in turn had a 10% share in Allianz.

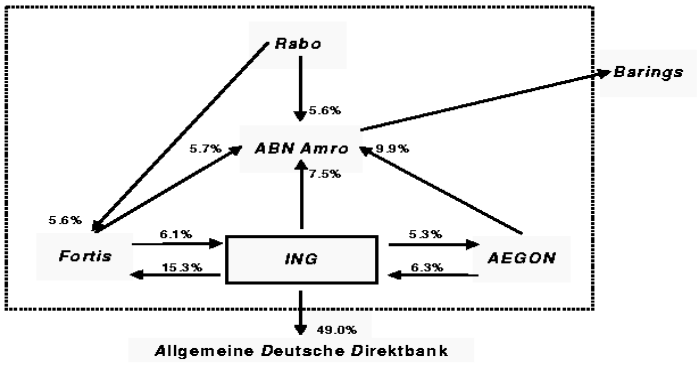
Figure 6.2 Bed fellows in Germany



Source: own research based on Commerzbank, Wer gehört zu wem, 2001

Especially in network-oriented financial systems, we find more complex ownership arrangements, such as cross-shareholdings (two or more firms have direct mutual equity participations) and owner cascades ("pyramids", two or more firms are indirectly connected through equity participations in third firms), which may solve free-rider and hold-up problems without having to hold a large direct equity stake. In Europe, cross-shareholdings and pyramidal structures are very frequent. In some countries, such as the Netherlands or Germany, they are even allowed among competing (financial) firms and between financial and non-financial firms. Figure 6.2 shows the case of Germany where Allianz, the largest European insurance company, and Münchner Rück, the world's largest reinsurance company, are linked through cross-shareholdings. Further, they are linked directly or indirectly to major German banks as well as foreign banks (e.g., Bank Austria). Allianz also holds significant minority blocks in the electricity giants, E.ON and RWE as well as in two pharmaceuticals, Bayer and Schering. The top four German banks (Deutsche, Dresdner, HypoVerein, Commerzbank) hold substantial blocks in the company (Deutsche Börse AG) that runs the German stock exchanges. Deutsche Bank is also an influential minority shareholder in the Gerling insurance group. Figure 6.3 exemplifies shareholding arrangements in the Dutch financial sector.

Figure 6.3 Bed fellows in the Dutch financial sector



In 2000, the bankassurance giant ING had cross-shareholdings with AEGON and Fortis. Moreover, ING held a significant direct voting stake in ABN AMRO. Also AEGON, Fortis and Rabo held direct stakes in ABN AMRO. Together these financial institutes controlled about 29% of ABN AMRO's voting capital. Since very recently, ownership structures have started to change, first at the national level, and now increasingly across borders. Figure 6.3 also shows two "cross-border" shareholdings. ABN Amro bought the US investment division of Barings from ING in 2000. ING holds is the largest shareholder of ADD (Allgemeine Deutsche Direktbank), a German direct bank. As reported in the press lately, ING is intending to expand its share in ADD.

Recent research by Goldman Sachs (2000, p. 21) reveals that leading European banks are linking up among each other and with insurance companies. The big European insurance companies, Allianz, AXA, Fortis and Generali, have established direct or indirect financial interests in major banks across the EU. As previous studies imply, such cross-border ownership arrangements were not very common in the 1980's and early 1990's.[109] This relatively recent phenomenon seems to have been triggered by the substantial changes in the market environment, including deregulation, technological and financial developments. There are some candidate explanations for the observed ownership structures of European banks and insurance companies. First, and importantly, banks and insurance companies need to invest the funds they attract and diversify their portfolios so equity participations in other financial and non-financial are necessary and natural ways to diversify risks. However, until the opposite can be proven to hold, it is not clear that it needs the current degree of "bed-fellowship" for stability reasons.

[109] See e.g. Gual and Neven (1993); Berger, Demsetz and Strahan (1998).

Ownership arrangements to overcome agency problems may not always be beneficial. As pointed out by Shleifer and Vishny (1997), controlling shareholders can extract surplus for themselves to the detriment of minority shareholders and stakeholders. The costs of such wealth expropriation and redistribution can be large, including the intangible costs of reducing the motivation of managers. Managers do need discretion to be able to use their superior skills profitably but they face a hold-up problem. They commit their specific skills to the firm but cannot appropriate the value enhancing effect of their actions if they do not share in the firm's profit. Rather a dissatisfied or impatient large shareholder can have them dismissed. Dismissal reduces career prospects on the market for managers. Dominant owners who keep managers on a short leash by excessive supervision and a constant threat of intervention stifle managerial initiative and entrepreneurial risk-taking (Burkhart, Gromb and Panunzi, 1997).[110] Therefore, the corporate governance literature has been discussing the design of "incentive compatible" remuneration schemes, such as bonuses, profit sharing or stock options as alternative or complementary mechanisms to resolve principal-agent conflicts.[111]

6.2 Is governing banks different?

Banks have received a lot of attention in the corporate governance literature as direct or indirect governors of non-financial firms (through routine monitoring, equity participations and supervisory board activities). Comparably little interest has been shown in how banks themselves are governed. One reason is that the principle points made on corporate governance do also hold for banks. However, four important qualifications are in order.

6.2.1 Externalities

Given the overriding importance of banks for the functioning of the financial system, ineffective governance of banks can have far more serious outside consequences than failure to correct mismanagement at non-financial firms. In the latter case, if the management of a very large firm messes up and is not caught doing so because of weak supervision, this is bad for shareholders' wealth and may cost jobs but it will hardly create far-reaching effects outside the firm or the industry. By contrast, with banks repercussions can be more severe because of

[110] Given the theoretical pros and cons of ownership concentration it is open to empirical testing which ownership structures and governance mechanisms allow for better corporate performance if they do have significance at all. Short (1994) surveys the empirical literature. Almost all of the evidence refers to Anglo-Saxon firms. The impact of ownership concentration and other governance indicators on corporate performance and finance is ambiguous. More recent research is discussed in Lehmann and Weigand (2000). They also provide empirical evidence for Germany which is characterized by high ownership concentration and significant stakeholder influences. They find a negative impact of ownership concentration on corporate performance.

[111] See e.g. Milgrom and Roberts (1992, Part V) and Prendergast (1999) for introductions and surveys. See also Tirole (1999).

contagion effects, particularly when banks are linked through ownership arrangements directly, e.g. via cross-shareholdings, or indirectly, through equity participations in the same third firms.

6.2.2 Managerial compensation and risk taking

In banking, performance-based, incentive-compatible remuneration schemes may backfire because they provide not only senior managers but, perhaps more importantly, risk traders or loan officers with an incentive to take on higher risks to increase the volume of business. There is also a principal-agent conflict between top-level and rank-and-file management which needs to be addressed. Anecdotal evidence, as from the notorious Baring breakdown, supports the existence of such adverse incentives.

Bank monitoring is not the outcome of an unproblematic black box process but has to be achieved by the bank's work force, most prominently by its loan officers. Monitoring of projects and borrowers by loan officers as well as monitoring of loan officers by higher-level bank managers is limited by the physical and cognitive capacities of the respective controller. Monitioring additional projects or people thus obeys the law of diminishing returns so that overload costs increase when the control span is extended. Increasing size to exploit scale and scope may give rise to X-inefficiency because the internal organisation becomes more complex. Here an important field for future research lays open in so far as corporate governance mechanisms in banking have to be scrutinised in more detail.

If managers are also owners, this could be good for stability because they would be more cautious in taking on more risk. There are some empirical studies on the link between managerial ownership and risk taking for US banks. The evidence is conflicting. Managerial ownership has been found both to increase and decrease risk taking.[112] As new research shows, the intensity of banking regulation plays an important role for the direction of this relationship.[113] In the late 1980s, when US banking was relatively less regulated, banks with higher equity holdings by bank managers (insider ownership) had higher total and bank-specific risk. After regulation was tightened in the early 1990s, the relationship became inverse. However, systemic risk, which is important to assess the potential for financial fragility, was not affected by the level of insider ownership in both periods.

[112] See Saunders, Stock and Travlos (1990) for a positive relationship, Chen, Steiner and Whyte (1998) for a negative relationship. The evidence in Gorton and Rosen (1995) suggest a nonlinear, inverted U-relationship.
[113] See Anderson and Fraser (2000).

6.2.3 Capital structure

The specificity and riskiness of the banking business (borrow short, lend long) implies that stakeholder interests are much more important than for non-financial firms. Commercial banks' dominant source of financing assets is "debt" (liabilities) in the form of deposits. Depositors are thus the main stakeholders. From the management's and shareholders' perspective, debt has the advantage that creditors do not have participation or intervention rights - except in the case of bankruptcy. The disadvantage lies in the compulsion to service debt on a regular basis which exerts a disciplining effect on managers. Banks are of necessity highly leveraged. Compared to non-financial firms bank equity tends to be very small relative to total capital. This discrepancy gives rise to adverse incentives for both bank managers and bank owners. At a low deposit rate, depositors as capital providers prefer a comparably low risk, while the bank as the borrower has an incentive to embark on riskier projects because they promise higher returns. This moral hazard behaviour is also in the interest of shareholders who stand to gain, especially when the liability of owners is limited, as is the case with stock-based and actively traded commercial banks. The limitation of liability increases the value of equity relative to the value of debt. At a given gearing and firm value the risk of bankruptcy increases with the variability of earnings. Debtholders participate in the bank's downside risk but not in its upside potential. By contrast, shareholders share in the upside gain of high-risk strategies, while limited liability shifts the downside risk on to the debtholders. Equityholders thus prefer riskier investment projects which raise their expected payoffs at the cost of the debtholders' expected payoffs (cf. Jensen and Meckling, 1976, pp. 335). The loss in equity value if the high-risk strategy fails will be overcompensated by the gain in equity value resulting from risk-shifting. This is the well-known risk-shifting or asset substitution problem (Jensen and Meckling, 1976; Harris and Raviv, 1991). This advantage is reduced to the extent that capital providers anticipate the adverse incentives of bank managers and bank owners and charge a higher risk premium. With a safety net for deposits in place, the taxpayer will finally have to carry the financial burden if things go wrong. Therefore, neither a bank's shareholders nor its depositors can be expected to have a strong incentive to exert effective corporate governance.

6.2.4 The public as residual claimant and banking supervision

Given the importance of the financial system, solving the free-rider and collective action problems of corporate governance in banking is a public good. Therefore, the residual claimant of banks, and thus their ultimate controller, is the public. To some extent, banking supervision can be seen as an instrument to provide this public good. Put differently, the public as a stakeholder of banks has delegated its governance task to a legally empowered institution. Although it is not yet the primary goal of banking supervision, supervisors may detect corporate governance conflicts in banks. The most recent literature on banking supervision and regulation

has touched on this governance dimension of banking and on the role supervision can play to improve on it (see Prowse, 1997; BCBS, 1999a; Llewellyn, 2000).

6.3 Corporate governance and the trade-off between stability and competition

How does corporate governance relate to the relationship between competition and stability? There are three issues here. Firstly, corporate governance deals with the information problem, and thus directly affects stability. Secondly, corporate governance can influence the intensity of competition in the product market. Finally, ownership arrangements can shield owners and managers from the disciplining role of the market for corporate control and prevent efficient restructuring of inefficient banks through private investors. We will discuss these effects in turn.

6.3.1 Corporate governance and stability

Well-designed corporate governance mechanisms add to securing systemic stability by reducing agency costs and thus enhancing the performance (profitability, investment) of individual banks. Concentrated ownership and cross-shareholdings may provide more effective governance because larger shareholders have a stronger incentive to protect their investments. They have the power to be informed insiders, that is, force managers to provide the relevant information, rather than remain uninformed outsiders.[114] In this way, managerial misbehaviour (e.g. excessive risk taking, diversion of funds) may be reduced to the benefit of bank-specific and systemic stability, provided this misbehaviour is not also beneficial to the shareholder. As argued above, excessive risk taking by managers may actually benefit shareholders and depositors because with deposit insurance in place, risk of failure can be shifted to the public. Ownership and institutional arrangements that amplify adverse incentives (here: moral hazard) to the detriment of the public (or, the taxpayer) are clearly not fostering systemic stability. Further, contagion effects may spread more easily if institutions are not only linked by market transactions but through ownership arrangements.

6.3.2 Corporate governance and product market competition

A strand of the corporate governance literature argues that intensive competition in product markets makes the mode of corporate governance less important (e.g. Demsetz, 1983; Hart, 1983; Hermalin, 1992; Schmidt, 1997; Allen and Gale, 2000d). Competition forces firms to adopt cost minimising production technologies and efficient governance and organisational

[114] See Mayer (1992) for the insider-outsider distinction. Shareholders' willingness to control and intervene may not only depend on the size of the stake held but on who they are. Put differently, the identity of owners can be a crucial determinant of shareholder activism. An insider may exert more effective control at any given level of blockholdings than an outsider. Families, allied industrial firms, banks, and holdings are in general argued to be insiders, while institutional investors such as pension funds are viewed as outsiders.

structures. More efficient banks will steal business from slack banks, driving the least efficient banks from the market. As long as entry is facilitated, this selection effect of competition eliminates inefficient structures and generates effective governance through market forces. In the banking sector, the threat of entry may not suffice because profitable entry is not so easy. Sheltered from entry, inefficient incumbents may survive, at least in the shorter run. Further, this line of reasoning takes a one-way direction, from competition to corporate governance. As we will discuss subsequently, corporate governance mechanisms can be used strategically to reduce the intensity of competition.

By linking managerial remuneration to the firm's revenues and/or profits owners can internalise the welfare of managers' and thus mitigate adverse managerial incentives resulting from principal-agent conflicts. At the same time, they can influence the firm's market position by influencing managerial behaviour through the appropriate choice of remuneration schemes (Fershtman und Judd, 1987). Ownership structure determines the optimal design of managerial remuneration. In firms with widely dispersed ownership managerial compensation will be based more on revenue maximisation, while concentrated ownership implies a stronger emphasis on profit maximisation. When firms with significantly different ownership structures, such as manager-led vs. owner-led firms, engage in quantity competition, this leads to greater quantities and a lower price compared to the standard Cournot outcome (Fershtman and Judd, 1987). Competition is more intensive because manager-led firms seek to expand sales to gain market share. However, manager compensation schemes can also facilitate tacit collusion. In concentrated industries options for managers to switch jobs may be fewer and differences in managerial compensation across firms smaller. This gives owners an opportunity to collude on product market outcomes by simply offering quite similar remuneration schemes. No direct or tacit agreements on prices or quantities would be necessary (Shy, 1996, ch. 15.3).

Ownership arrangements that include actual or potential product market competitors soften incentives to compete vigorously. The disciplining and efficiency enhancing effect of product market competition is impaired. Cross-shareholdings among direct competitors increase the incentive for complacent behaviour and soft competition in product markets. It has been shown theoretically that oligopolists with equity interests in competitors produce less output, charge higher prices, and have higher price-cost margins than oligopolists without such silent financial interests (Dietzenbacher, Smid and Volkerink, 2000). There is empirical evidence for Dutch banks in support of these theoretical results (Dietzenbacher et al., 2000).

In principle, disciplining effects can also come from potential and actual newcomers. However, there are barriers to entry, in particular because reputation plays a prominent role in banking. Entry will thus be costly, even for internet-based banking. Further, incumbent banks can strategically deter entry. For example, in oligopolistic markets a high gearing may credibly signal to potential entrants that incumbents are willing to respond aggressively to any attempt of stealing business (Brander and Lewis, 1986). Hence, incumbents can take advantage of a high

gearing to reduce quantities and raise prices. High gearing is a striking feature in banking. A comparably low share of equity in total capital may signal a bank's willingness to wage a price war on entrants. Such a threat may be particularly credible under full deposit insurance, since, due to risk shifting, neither managers nor shareholders or depositors stand to lose if things go wrong.

6.3.3 Ownership arrangements and the market for corporate control

Competition in the product market reveals inefficient players. If they do not want to be driven from the market, they have to become efficient by restructuring their organization and activities. If incumbent management or owners are not capable of doing so, outsiders who recognize the firm's potential can take the firm over by buying up the control rights in the market for corporate control (Manne, 1965). Ideally, the existence of an active and liquid market for corporate control exerts a disciplining effect on managers. The imminent threat of hostile takeovers is thought to force managers to perform in the shareholders or stakeholders best interests. In practice, imperfect competition in the product markets, free-rider problems and anti-takeover defenses hamper this disciplining and efficiency-enhancing effect. In Continental Europe, concentrated ownership, cross-holdings and pyramidal structures have shielded financial firms and non-financial firms alike from hostile takeover attempts. In this respect, incumbent bank managers may be entrenched and remote from being effectively and efficiently controlled through capital markets. This may have been in the governments' interest in order to avoid foreign takeovers. Therefore, in many EU countries public or semi-public bail-outs of failing banks dominated for a long time rather than leaving it to market forces. Most consolidating M&A's in the European banking industry in the 1980s and 1990s were domestic, involving primarily small-sized banks. Inter-industry deals were of inferior importance compared to bank-to-bank activities (see Gual and Neven, 1993; Berger, DeYoung, Genay and Udell). The empirical evidence implies that shareholder-value maximization has rarely been the motivation for consolidation (Berger, Demsetz and Strahan, 1998; Berger, DeYoung and Udell, 2000). Up to now, the threat of being taken over has not been a real one for European banks.

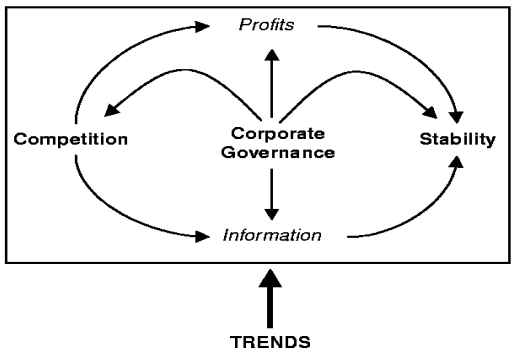
With the increasing integration of financial markets European markets for corporate control rights continue to gain liquidity and importance, probably substantially so. If it becomes easier for investors to buy up, expand or sell off equity blocks, we can expect more friendly and hostile takeovers of banks and other financial services providers in the future. The leading players in the financial sector are already responding to the changing environment by building up cross-border nets of holdings among banks, insurance companies and also non-financial firms. This may lead to large financial conglomerates which, again, are opaque to external investors and sufficiently immune to takeovers.

Summary and assessment

Corporate governance mechanisms such as ownership concentration, cross-shareholdings and remuneration schemes can affect the trade-off between competition and systemic stability positively or negatively. Figure 6.4 summarises the potential effects of corporate governance mechanisms on the competition-stability relationship. The discussed corporate governance mechanisms reduce informational asymmetries, at least between managers and owners. This should improve bank performance and thus stability. If the alignment of interests within the bank is ascertained by outsiders (external investors, depositors) as genuinely positive, the bank's reputation is enhanced, improving investors' confidence in the bank to the benefit of stability. Competition among banks with separation of ownership and control (that is, in general, low ownership concentration) will reduce industry profits, thus making the industry more susceptible to shocks and giving rise to instabilities.

Inducing managers to maximise revenues and expand market share may threaten systemic stability if it leads to cut-throat competition. By contrast, concentrated ownership in combination with market concentration implies greater profits, which bolster banks' net worth, but raises prices and lowers quantities, which is to the detriment of consumers. Increased profits may be good for stability but reduced competition allows for slack and inefficiency. Further, market concentration increases the probability of similar compensation schemes, facilitating tacit collusion to the disadvantage of bank customers. Given the importance of reputation and the peculiarities of banks' capital structure, entry may be expensive so that

Figure 6.4 Corporate governance and the competition-stability relationship



incumbents are not pressured to minimise costs. Cross-shareholdings among competitors reduce product market competition to the detriment of consumers. Again, as profits are raised, the point of securing stability can be made. Competition in the product market combined with an effective market for corporate control contributes to controlling banks and disciplining managers. Concentrated ownership and cross-holdings make it harder for outside investors to gain a controlling influence on target banks. Bank manager are thus shielded from hostile bids to some extent. As the functioning of the market for corporate control is not free of problems, it is not obvious whether such takeovers are good or bad for stability. Clearly, in the ideal case a badly performing bank is taken over by a "good" bank to the benefit of systemic stability. Even though, a takeover may not be wanted from a competition policy point of view if it enhances the market power of the acquirer.

6.4 Policy implications

In assessing the Asian crisis, the Basle Committee (BCBS, 1999ab) has identified inadequate corporate governance in the banks as an important contributory factor. As our above discussion has pointed out, corporate governance in banking cannot be kept distinct from how banking markets work. Rather corporate governance mechanisms impact on the intensity of product market competition, the workings of the market for corporate control and the extent of bank-specific and systemic stability. However, these effects can go in different directions so that the total effect remains ambiguous. It also depends on the institutional and regulatory arrangements in place, such as deposit insurance, capital requirements or permitted forms of ownership. For example, without deposit insurance, stakeholders must be more careful who they give their money to. They have a stronger incentive to look for sound and well-governed banks. As the costs and difficulties of implementing prudential supervision for larger globalising and diversifying institutions increase, a reasonable policy measure may therefore be "to sever the link between the institutions and the safety nets ... by not allowing these institutions to offer deposits backed by government guarantees." (Hoenig, 1996) These institutions would then have to guarantee the safety of deposits in other ways, for instance, by collateralisation. Further, requiring banks to hold adequate amounts of equity capital to safeguard against risks reduces the scope for risk shifting and makes both managers and shareholders more accountable and responsible. A flexible, risk-oriented approach regarding capital requirements has just been suggested by the Basle Committee. Given that the public is the ultimate claimant of banks, banking supervision should be directed more at forcing banks to implement "good" corporate governance. As spelled out by the Basle Committee (1999a) and Llewellyn (2000), this includes transparent ownership and management structures, with clear lines of accountability and responsibility, independent non-executive directors on the banks'

boards, and monitored risk analysis, among others. A first step to make ownership structures more transparent is to simply not allow cross-shareholding arrangements among direct or indirect competitors. As our analysis has shown, such ownership arrangements serve primarily as shields against takeovers, reduce product market competition and do not unequivocally overcompensate the negative effect on competition by significantly improving systemic stability.

7 The Euro repo markets

This chapter illustrates the trade-off between competition and stability in Euro repo markets. The amount of liquidity extended between banks through repo markets, the fact that the larger banks are able to trigger systemic crises, and the potentially high contagion risks associated with interbank markets (see section 3.3.2) explain our interest with these markets. Although the economies of scale and scope in Euro repo markets linked to information technology, learning and collateral management give larger banks a head start to smaller banks, the degree of competition in Euro repo markets is still high. But, in the future a limited number of suppliers of liquidity could lead to certain negative externalities such as excessive prices for users of liquidity or unjustified barriers to entry for new suppliers of liquidity. Furthermore, a highly concentrated market structure combined with a low degree of competition could stack the odds against repos protecting banks and markets from systemic risks and contagion.

Thus far, there is little economic literature on Euro repo markets. This chapter aims to fill this gap by exploring how competition for liquidity through repos can increase efficiency in this market, without endangering stability in the banking sector. Moreover, we also analyse the implications of increased internationalisation for Euro repo markets.

7.1 Euro repo markets

What is a repo?

A repo is a sale of securities for cash with a simultaneous commitment to repurchase the securities on a future date (Corrigan et al., 1999, p. 11).[115] Essentially, a repo is a loan that is backed by securities. The securities used as collateral are mostly central government bonds (over 91% according to ISMA, 2001, p. 17). There are two different types of collateral: general and special. With general collateral, lenders of cash do not mind which security they receive out of a basket, while with special collateral, lenders of cash want a specific security.

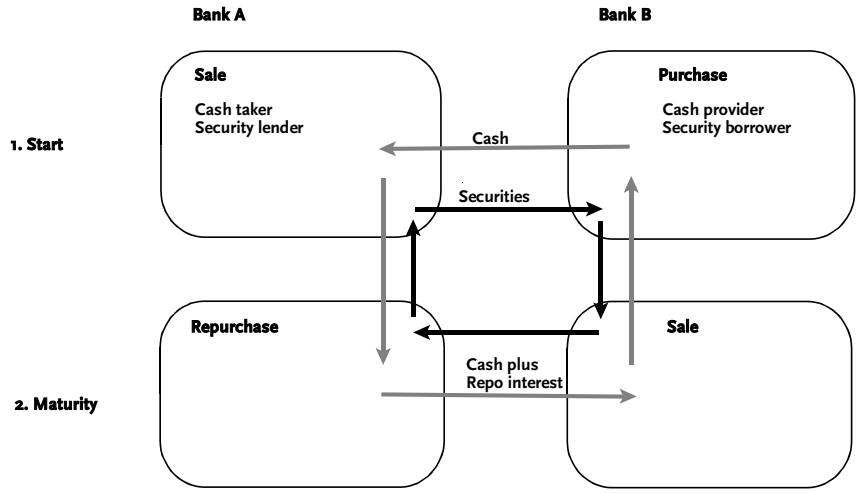
To clarify, Figure 7.1 gives a schematic overview of a repo agreement. At the start of the repo, Bank A borrows cash from Bank B and lends securities to Bank B for a period that can range from one day (overnight repo) to up to one year (term repo).[116] Bank B is referred to as the buyer, while Bank A is referred to as the seller. The sellers' side of the transaction is called a repo, while the buyers' side is called a reverse repo. At maturity of the repo, Bank A pays back the cash to Bank B and Bank B sends back the securities to Bank A. Bank A also pays back a return for the

[115] In this study the term repo is used generally to cover three forms of transactions: classic repos, sell/buy-back and securities lending. Each of these transactions differ in legal structure but the economics of each transaction are similar (see Corrigan et al., 1999, pp. 11-18).

[116] In some markets (e.g. in France), repo goes out to two years (although there is not much activity at this horizon).

use of the cash based on the repo interest rate. The maturity of the repo is either fixed at the outset of the agreement, or extended on a day-to-day basis (open repo).

Figure 7.1 A repo agreement



The buyer of securities obtains full legal ownership of the securities for the duration of the agreement. However, both the risk and return associated with the securities accrue to the seller, even though the buyer owns the securities for the duration of the agreement. This is because of the commitment of the seller to repurchase the securities for the same amount of cash as received at the start of the repo. Thus, if the value of the securities falls during the repo, the seller incurs a loss since she has to repurchase at the original price. If the seller were to default on her obligation to repay the cash, the buyer is entitled to sell the securities. Conversely, the seller can use the cash to replace her securities if the buyer fails to return the original collateral. If a shortfall of collateral occurs, the buyer has the right to ask the seller for top-up collateral (margin). Conversely, if a collateral surplus occurs, the buyer is obliged to return the surplus to the seller. These so-called *marking-to-market* calculations ensure that collateral is priced at current market prices.

The price of a repo transaction is expressed as an interest rate. Participants that enter the market to borrow money against securities will *pay* the general collateral (GC) repo rate.[117] For participants that enter the market to borrow securities, the price of the transaction is more complicated. As the providers of funds (they post cash as collateral to obtain securities) they *receive* an interest rate. If this rate drops below the prevailing GC repo rate, the repo rate is said

[117] Note that sell/buy-backs are traditionally quoted in terms of a forward price, rather than a repo rate.

to be *special* (Keane, 1996). Repo rates become special when participants need specific securities and consequently accept a lower return on their funds to obtain them. Note that the price paid by these participants will fluctuate with the availability of securities they are seeking. As the desired securities become scarcer, the spread between the general and special repo rates widens.[118]

The economic importance of the repo market

The repo product is not well known to the public. Probably, that is why its economic importance is often insufficiently appreciated. Its importance stems from the following (Corrigan et al., 1999):

- Repos are widely used by market participants (mainly banks) to obtain funding to cover temporary liquidity shortages. Repos enable market participants to economise on liquidity costs by lending out excess liquidity at close to other money market interest rates[119] and at low risks. In sum, repos enable the smooth functioning of the payment system.
- The repo market is closely linked to the unsecured deposit, the derivatives and securities markets. This makes repo *the* key instrument in the process of improving the depth and liquidity of Europe's financial markets. Repos (reverse repos) often substitute for attracting (placing) retail deposits and unsecured credit. Repos and reverse repos are used to hedge against or speculate on future interest rate changes, or simply to arbitrage away interest rate differentials. Reverse repos are a source of demand for equities and bonds (often to cover short positions), and thereby increase liquidity in capital markets. Market participants use reverse repos to obtain special securities for delivery in maturing futures contracts. Repos enable the funding of margin in derivatives contracts. One of the main functions of repo is to provide leverage gearing.[120]
- The ECB has chosen repos as its key instrument to implement monetary policy in the Euro area. The national central banks (NCBs), which act as agent for the European Central Bank (ECB), conduct reverse repos known as main refinancing operations (MRO's) with commercial banks to inject liquidity into the financial system. The securities received as collateral protect the Eurosystem (the ECB and the NCBs of the EMU member states) against financial losses (ECB, 2001b, p. 49).[121] The repo rate allows the ECB to signal its policy intentions and it is a source of information on market participants' short-term interest rate expectations. Repos are also part of

[118] The spread between general and special repo rates is known as a measure for "specialness" (Keane, 1996).

[119] The Euro repo market is a segment of the Euro interbank money market. It constitutes together with the unsecured deposit market, short-term derivatives markets (forward interest rate agreements and interest rate futures, foreign currency and interest rate swaps), and the short-term securities markets (treasury bills, bank certificates of deposit, commercial paper) the Euro interbank money market (ECB, 2000a, p. 40).

[120] This is essential, given the low margins on many trades.

[121] Article 18.1 of the Statute of the ESCB allows it to transact in financial markets by buying and selling underlying assets outright or under repurchase agreements and requires all credit operations to be based on adequate collateral (ECB, 2000d, p. 38).

M3, the monetary aggregate that underlies the first pillar of the ECB's monetary policy strategy (Eijffinger and de Haan, 2000, p. 62).

The size of the repo market

There is a chronic lack of (reliable) data on repo markets.[122] Estimates vary, but the total value of Eurozone repo contracts (excluding repos with central banks) outstanding at close of business on June 13, 2001 was approximately EUR 1.9 trillion (EUR 1.863.000.000.000 to be precise) of which 49.6% were repos and 50.4% were reverse repos (ISMA, 2001, p. 6).[123] [124] The total is a gross figure. This means that it has not been adjusted for double counting, that is, it does not take account of the fact that contracts between pairs of banks have been reported by both banks and therefore counted twice. In order to adjust for double-counting it would have been necessary to know specifically to what extent repos are interbank. The interbank figure would then be reduced by anything up to 50%. However, banks had difficulty in splitting up their business into interbank and customer. In the US, repo activity is even more widespread, average trading volume for 2000 was about $2.5 trillion a day (Source: Federal Reserve Bank of New York, on www.bondmarkets.com from the Bond Market Association). The US repo market has grown into the largest financial market in the world, surpassing stocks, bonds, and even foreign exchange. Unlike the US repo market, the repo markets in Europe have been slow to develop. There are still 15 separate national repo markets in the EU. Table 7.1 reports recent data on repo market amounts outstanding in individual countries.

[122] The chronic lack of data on repo activity can be traced back to the over-the-counter (OTC) nature of the repo market. Repo trades are often not centrally recorded because they are traded at decentralised telephone markets. Also, the secrecy of central banking with which the repo business is closely associated, the different reporting arrangements and definitions, and the technical complexity of repo transactions make it is hard to get an accurate picture of trading volume (CEPS, 2000). The European Repo Council has issued questionnaires to improve upon this situation.

[123] The exposure of banks in EMU to the interbank money market is far greater than the exposure of banks in the US, the UK and Japan. Interbank assets (liabilities) of banks in EMU are on average 23% (25.5%) of year-end balance sheet totals over the period 1996-97 as compared to only 3% (1%) in the US over the same period (own calculations with the help of OECD, 1999). The low exposure of US banks to the interbank money market according to above OECD figures as compared to the CGFS figures in Table 7.1 is due to the high exposure of nonbanks to the US interbank money market. The size of the repo market as a share of the interbank money market was early 1999 estimated to range from about 16% in Germany and 21% in France to 96% in Italy (CEPS, 2000).

[124] Some 47% has been negotiated directly with the other counterparty, 46% through voice brokers and 8% through inter-dealer Automatic Trading Systems.

Table 7.1 Repo market amounts outstanding in selected countries (US dollars)[a]

	US	France	UK	Japan	Italy	Germany	Belgium	Sweden
2000	2636.8	240.0	206.0	197.2	137.8	119.6	90.9	42.2

[a] In billions; amounts outstanding at the end of the year.
Source: CGFS (2001, p. 7).

The unsecured deposit market

For our understanding of the repo market, it is worthwhile to make an aside on the unsecured deposit market. Participants in the unsecured deposit market exchange liquidity without the guarantee of collateral. Liquidity is mostly concentrated on shorter maturates, with the bulk on overnight transactions. Since the elimination of currency risk in 1999, the unsecured deposit market has become the most highly integrated segment of the Euro interbank money market. Across the Euro area an uniform price reference for unsecured overnight liquidity (EONIA, Euro Overnight Indexed Average) and unsecured liquidity up to one year (EURIBOR, Euro Interbank Offered Rate) has emerged, which contrasts with the variety of prices for secured liquidity (more on this in section 7.3).

In the unsecured deposit market the size and rating of the participant is most relevant (reputation effect). A certain pattern of size-related specialisation (tiering) seems to have developed, according to which large banks are usually active on the Euro area-wide money market in cross-border deals, thereby enhancing market integration and ensuring homogenous conditions for the funding of smaller banks (ECB, 2000a). Ciampolini and Rohde (2000, p. 5) find that a few large banks per country do regularly enter cross-border transactions, and do so with the large banks of other countries, while transaction amounts are often high. Smaller banks do not customarily trade cross-border, limiting themselves to dealing with the larger banks of their own country. At the time of the introduction of the Euro, large banks were generally not sufficiently aware of the credit quality of the smaller banks in other countries. The two-tier structure of the unsecured deposit market puts the largest banks in a position of advantage.[125] On days when liquidity imbalances and interest rate differentials across countries happen to be particularly sharp, the largest banks "arbitrage" liquidity in and out from their own country, borrowing domestically and lending abroad at higher rates (or the other way around). Under more "normal" conditions, large banks have the possibility to choose whether they want to finance their short position for the day (or to place excess liquidity for the day) within their own country or cross-border. In other words, while performing an important liquidity redistribution function, the largest banks do make a profit out of it. This study will show that the move away from the unsecured market in favour of the secured market could mean a significant reduction

[125] Of course, this two-tier structure disappears when the larger 1st tier banks take over the smaller 2nd tier banks (the consolidation trend in the banking sector in Europe).

in systemic risk. However, the costs of participation in the repo market need to be reduced first before new participants will enter and can contribute towards the creation of a more competitive market structure.

7.2 Competition in Euro repo markets

Despite the repo markets' size and economic importance, information about basic market structure characteristics is surprisingly limited. Competition for liquidity through repos increases for two main reasons, namely the rising number and diversity of participants in the use of collateral and the increasing homogeneity of repos raises the willingness to use repos.

7.2.1 A greater diversity of participants

Use of collateral implies either more favourable financing conditions (price effect) and/or broader or deeper access to markets (quantity effect). Traditionally, trade in the unsecured money market is among market participants with high credit ratings, and for them the use of collateral is not necessary. However, in the secured money market also the rating of the securities used as collateral (collateralisation effect) matters. Lower-rated participants typically have to post collateral when dealing with high-rated counterparties, particularly if trades are on a cross-border basis (CGFS, 2001, p. 7). Also high-rated participants often want to post collateral if the benefits of the use of collateral (lower funding costs and capital requirements[126]) outweigh the costs of using collateral.

The price effect is observable. Euro GC repo (collateralised funding) rates are generally slightly lower than the Euro Libor[127] (uncollateralised funding) rates.[128] [129]Still, during calm or non-crisis periods there is little differentiation in the price and both rates tend to move together.

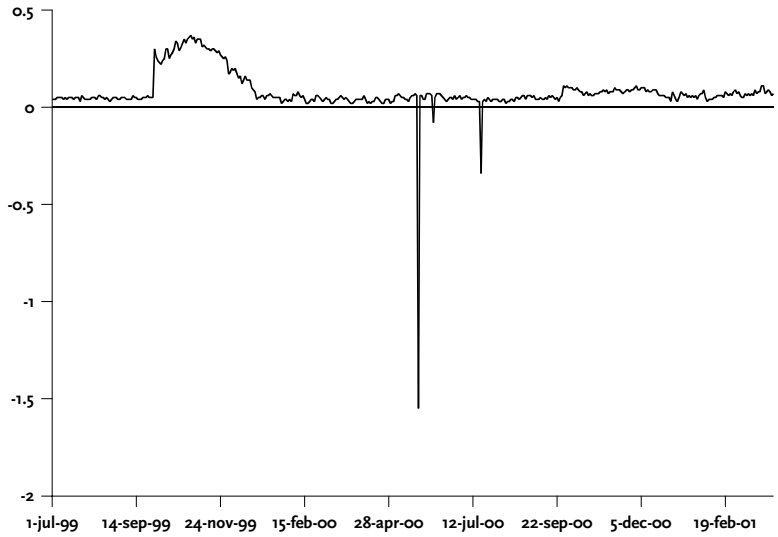
[126] For most repos capital requirements are low. No regulatory capital is required for repos against securities issued by OECD central governments.

[127] Euro Libor is the rate of interest at which banks borrow Euro funds from other banks in the London interbank market.

[128] Both rates are an arithmetic average of middle two quartiles contributed by a panel of 12 financial institutions.

[129] Between overnight and one week, Euro repo rates sometimes exceed deposit rates due to demand from users of repo who do not have access to deposits.

Figure 7.2 Spread: 3-month Euro Libor minus Euro GC repo rates (in percentage points)



Source: British Bankers' Association.

Figure 7.2 also shows that the spread between uncollateralised and collateralised funding sources can fluctuate dramatically during periods of market tensions.[130] [131] For instance, during the year 2000 (Y2K) period Euro Libor rates far exceeded Euro GC repo rates.[132] Observe also the three downward spikes. The downward spike on 25 May 2000 was probably due to the risk of not having enough general collateral for the bids submitted. GC repo rates rose sharply. This risk arose from excessive overbidding in fixed rate tenders. On 8 June 2000 the ECB raised its main interest rate by 50 basis points. However, the downward spike of 19 July 2000 is hard to explain from official ECB publications. Again, GC repo rates rose sharply. But overbidding cannot be the reason since by then the ECB had switched to variable rate tenders.[133] Also there was no ECB interest rate change.

The extent to which access broadens and deepens with collateral is very difficult to measure. Theoretically, the supply of good (at least AA-rated) collateral would allow participants of lower credit standing to enter the market for (cross-border) liquidity that would be limited to that

[130] It would be interesting to examine to what extent this spread depends on the level of the Euro GC repo rate.

[131] This spread is also a useful stress indicator.

[132] See Hartmann, Manna and Manzanares (2001) for a high-frequency study of the Y2K period in the unsecured deposit market.

[133] As from 28 June 2000 the main refinancing operations are conducted as variable rate tenders, using the multiple rate auction procedure (ECB, Press Release of 16 June 2000).

participant without collateral.[134] Why? First, collateral reduces the possible loss in the event of counterparty default (the credit risk mitigation effect). At the start of a repo transaction (assuming zero initial margin[135]), the buyer (the party borrowing securities) has a by collateral mitigated credit risk vis-à-vis the seller (the party lending securities) (see de Haas and Keijser, 2001, p. 4). The credit risk is effectively reduced by the liquidation value of the collateral, even if the liquidation value turns out less than expected (CGFS, 2001, p. 18). As a consequence of price movements in underlying securities (market risks) one of both parties will get additional credit risks. When collateral increases in value the seller has a credit exposure since the value of collateral becomes higher than the amount of cash provided. In contrast, if the value of the securities decreases, the buyer will find part of her credit risk not mitigated by collateral, thereby effectively creating a credit exposure. The fluctuations in credit risks in repos are as it were directly derived from the market risks of underlying securities.

Second, collateral reduces the likelihood of default. The giving of collateral should give the seller an incentive to incur a lower level of risk than would otherwise be the case (the incentive effect).[136] The more collateral, the more the seller has to lose in the event of failure. More collateral indeed leads to this incentive effect, which is largely due the fact that moral hazard is reduced. However, Stiglitz and Weiss (1981) show that asking for more collateral can also lead to adverse selection, where only the least risk-averse participants (bad credit risks) are willing to give collateral. The ultimate positive or negative effect of asking for collateral is the sum of reduced moral hazard (positive) and increased adverse selection (negative).

Third, collateral enables participants to signal their creditworthiness and so overcome problems of asymmetric information which would otherwise result in their access to credit being rationed (the signalling effect). In periods of stress, the unsecured market seems more prone to credit rationing and to an abrupt retreat of lenders than the secured market. The credit risk protection provided by collateral and the right to call for margin moderates the tendency of lenders to leave the repo market in times of stress. During calm and non-crises periods, however, the secured and unsecured markets are more each other's complement and the expansion of the repo markets seems to be more related to the need to reduce regulatory capital than to the need to mitigate credit risk or to overcome problems of asymmetric information. Many collateralised positions qualify for a lower capital requirement than uncollateralised

[134] One of the cardinal principles of the repo market is that repo should not be done with any counterparty with whom there is no credit line for unsecured business. This is because of the drawbacks to having to use collateral and because credit lines depend on probability of default, not probably loss.

[135] An initial margin is a risk control measure implying that the collateral required for a repo is equal to the cash provided to the counterparty plus the value of the initial margin (overcollateralisation). Thus, an initial margin of 10% (a margin ratio of 1.1) implies that 100% cash is provided against 110% collateral.

[136] See Coco (2000) on the use of collateral as an incentive device.

positions under current and prospective capital standards.[137] In sum, the price and quantity effect of collateral *potentially* increase the number and diversity of repo market participants.[138]

7.2.2 A greater willingness to use repos

Notwithstanding the potential increase in the number and diversity of repo market participants, the actual number and diversity of repo market participants is limited. The main dealers and end-users in the Euro repo markets are banks. The Eurosystem is also an important, although in most countries not dominant, participant in Euro repo markets. The Eurosystem's counterparties consists of eligible credit institutions (mostly commercial banks). The Euro repo markets are also highly concentrated. In Germany 85% of transactions takes place between banks, while in France three major banks account for 32% of daily turnover in government securities repos (CGFS, 2001, p. 33). ISMA (2001, p. 7) reports that the top ten banks in the survey accounted for 64% of the total reported business. The top twenty banks accounted for 88% and the top thirty banks accounted for 97%.

Though, the above analysis can be misleading. It shows a high degree of concentration, but this should not be confused with market power (see section 2.2). A better measure of the concentration of market share, which is often used in competition analysis, is the Herfindahl Index.[139] The Herfindahl Index for the survey was 0.05, which is low, showing a healthy degree of competition.

Why are the Euro repo markets so concentrated? First, the high degree of concentration reflects in general the trend towards consolidation in the financial sector. Second, the large standard contract size of repos is beyond the reach of many smaller firms. Many corporations and financial institutions are unaware of the advantages that repos can offer. Third, repo markets may be even more concentrated than other markets because of inherent barriers to

[137] See de Haas and Keijser (2001) for an excellent discussion of the regulatory treatment of collateral in the "new" Basle Capital Accord (Basle 2). A wider range of collateral would be allowed by the new Accord and banks would be able to choose between a comprehensive and simple approach for the treatment of collateral. The deadline for Basle 2 has been postponed until January 2005. The European Repo Council and the The Bond Market Association have send a letter to the Basle 2 group expressing the worries of the industry about Basle 2's undervaluing of repo markets for the global liquidity.

[138] Note also that there are low legal barriers to entry for new firms into the repo markets in the EU (Corrigan et al., 1999, p. 7). Credit institutions (since January 1, 1993) and investment firms (since January 1, 1996) authorised by a competent authority in another EU country can conduct repo business without requiring further authorisation for that business in any other EU country. This regime is contained in the First and Second Banking Co-ordination Directives and the Investment Services Directive, respectively.

[139] The Herfindahl Index is the sum of the squares of the market shares divided by the square of the sum of market shares. The higher the index, the lower the degree of competition. If the index is higher, the more a single participant has a dominant market share and/or the more insignificant the market shares of all other participants. A market in which several participants have very large market shares can therefore have a relatively low index.

entry or scale effects linked to information technology, learning and collateral management. According to the ECB (2000a, p. 42) these entry barriers or scale effects are due to:[140]

a. the diverging prices of underlying bonds and their differing degrees of liquidity
b. the lack of harmonisation of the legal documentation used for repo agreements
c. practical difficulties in the cross-border management and settlement of collateral
d. different tax treatment of bonds; and
e. an uneven availability of collateral across the Euro area.[141]

If the repo product in EMU could be made sufficiently homogenous, this would reduce the unit costs of each transaction. Small banks, corporations and institutional investors would enter the market and thereby increase competition for liquidity. What do we mean by homogeneity? By homogeneity we do *not* mean that the variety of GC repo prices due to differences in credit[142] and liquidity risks of underlying collateral should be eliminated. Table 7.2 shows that in the GC segment, repo rates differ for collateral issued in different jurisdictions (see also Bank of England, 1999, p. 30). DEM is slightly more expensive than NLG, which is more expensive than ITL, which is more expensive than BF. A bond is more expensive in repo if its repo rate is lower. Notice also that the spread between DEM and BF increases with maturity (from 2 basis points for overnight liquidity to 7 basis points for 6 months liquidity).

The credit risk mitigation effect seems to make repo transactions to be preferred to unsecured transactions for longer maturities. Most repos are for terms longer than one day, which is in sharp contrast to unsecured transactions (Santillán, Bayle and Thygesen, 2000, p. 16). The bulk of contracts (62%) has maturity of less than one month remaining to maturity but there was significant business out to one year (ISMA, 2001, p. 20). Some 14% of contracts have one day remaining to maturity, 30% have between two and seven days, 18% have between eight days and one month, 11% have more than one month and up to three months, 7% have over three months and up to six months and 11% have over six months and up to twelve months.

[140] Such differences may even form barriers that slow down the spread of market disturbances.

[141] The availability of collateral across the Euro area depends to a large extent on the supply of collateral that is related to payments imbalances of sectors (mainly governments) in different member states of EMU. These payments imbalances penetrate the Euro area repo market if they are financed by the issuance of securities.

[142] Note that credit risk premiums on EMU government bonds have probably increased as a result member country's loss of monetary sovereignty. Creating inflation is not an option anymore to payoff public debt.

Table 7.2 GC repo rate offers on 11 June 2001 of a big Dutch bank

	DEM	NLG	ITL	BF
S/N	4.48	4.49	4.50	4.50
1 WK	4.48	4.48	4.49	4.50
2 WK	4.47	4.47	4.48	4.50
1 MTH	4.44	4.45	4.46	4.47
2 MTH	4.36	4.36	4.37	4.41
3 MTH	4.32	4.33	4.34	4.37
6 MTH	4.20	4.21	4.22	4.27

Notes: S/N = spot/next, WK= week, MTH =month
DEM general collateral repo rate, with German government bonds as underlying collateral
NLG general collateral repo rate, with Dutch government bonds as underlying collateral
ITL general collateral repo rate, with Italian government bonds as underlying collateral
BF general collateral repo rate, with Belgian government bonds as underlying collateral

The fact that the Euro repo markets have to be secured on securities from a variety of nationalities with a range of political attachments implies that market separation of repo markets in the Euro area will continue. Of course, this is good since differences in risks should be priced. Large and differing public debt service obligations of EMU member states, these states' differing tax and expenditure mix[143] and differing debt management prevent full uniformity of price. Full uniformity of price cannot be the goal since full elimination of GC repo rate differences in EMU would require all repos to be secured on debt of a single issuer.

Then, what do we mean by homogeneity? Repo market participants seeking to reduce credit risks through the use of collateral face legal uncertainty regarding the right of the collateral taker to re-use (liquidate, transfer, pledge or hypothecate) the securities. In addition, institutional, operational and technological barriers due to the jurisdictional location where securities are held and the location where counterparties reside hamper the cross-border transfer of securities. GC repo rates differences are determined by concentrated holdings of collateral with domestic banks (French collateral securities with French banks) and the difficulty in Europe of collateral being stuck in domestic markets. According to the ISMA (2001) European repo market survey of June 2001 53% of outstanding repo contracts were with domestic counterparties and 42% were cross-border. Splitting the latter figure down, just under 25% were with counterparties in eurozone countries and (both eurozone to eurozone and eurozone to non-eurozone transactions) and almost 18% were with counterparties outside the eurozone (both eurozone to non-eurozone and non-eurozone to non-eurozone transactions). The remaining 5% were negotiated anonymously through automatic trading systems (ATSs) and settled with a central clearing counterparty which means that it is not possible to categorise them as either domestic or cross-border.

[143] That is, where in the budget are resources found to pay for high debt service obligations.

7.3 Instability in Euro repo markets

In order to answer the question how increased competition in Euro repo markets affects (in)stability; this section provides a description of the systemic and contagion risks associated with repo transactions.[144] Systemic risk means that the failure of an institution or crash of a market leads to many *simultaneous* failures or crashes. Contagion means that the failure of an institution or crash of a market leads to one or more *sequential* failures or crashes (see section 3.1). There are two layers in the analysis of instability. The first layer is the fundamental reasons or market failures for why there *could be* instability. But that does not imply that there is instability since there must be a trigger. The second layer is what *triggers* instability and how instability *manifests* itself.

Repos have the unique characteristic in that they can either protect banks and markets from or contribute to systemic risk and contagion. Both circumstances stem from the repo market's linkages with other financial markets. In situations of careless risk management the probability of shocks affecting the system is much greater because of leverage etc. (see below). However, the mere use of collateral can reduce propagation, as it serves to minimise any potential loss (the credit risk mitigation, incentive and signalling effects in section 7.2.1). Moreover, repos act as source of liquidity in other financial markets in contrast to the unsecured money market, which is more sensitive to counterparty default.

Leverage

Repos facilitate the leverage (the ratio of risk exposure to capital) of long positions through their role in funding additional calls for margin in derivatives markets. There exists also an inherent multiplier effect in repo markets since the securities received in reverse repos may be freely used in other repos, eventually increasing the leverage ratio and the various risks discussed hereafter.

Credit risks

The exposure to credit risk on a repo is a function of the creditworthiness of both the counterparty and the collateral. If one counterparty fails, the other can rely on the securities or cash to cover losses and if the issuer of the collateral defaults, the buyer can rely on the seller to replace the collateral. A simultaneous default of both the counterparty and the issuer of the collateral is highly unlikely if the correlation between counterparty and issuer default is low.[145] Still, the use of collateral does not fully eliminate credit risks. Unless initial margins and haircuts are very large relative to the volatility of the position being collateralised, unsecured

[144] Alan Greenspan (1998) argues that excessive short-term interbank funding, especially cross-border is the "Achilles' heel of the international financial system that is subject to wide variations in financial confidence".
[145] Arnold and Lemmen (2001) have examined this issue.

credit risk can emerge in the period between an increase in credit exposure (due to volatility in the value of collateral) and the time when top-up collateral is posted.[146]

Legal risks

Legal risks arise if there is uncertainty about the terms of the agreement. The collateral taker assumes not only credit and liquidity risks but also the legal risks embedded in the asset taken as collateral.

Liquidity risks

It remains doubtful whether the provision of collateral actually reduces the probability of default occurring very much. It may even increase the probability of default, by imposing liquidity risks on the provider of collateral (either cash or securities). The combination of marking-to-market and initial margins and haircuts[147] can lead to sudden demands for top-up collateral. In particular, margin calls following a *market-wide* drop in collateral values could lead to liquidity pressure for all market participants and a scramble for margin. Margin calls by the Eurosystem could further exacerbate declines in market liquidity. Even holding diversified collateral portfolios will offer little comfort in such stress situations. Consequently, what started as a liquidity crisis could easily go over into a solvency crisis. In addition, repos have the disadvantage that banks' other claimholders (e.g. unsecured and retail deposit holders) may fear that there are not enough liquid assets to cover their claims since liquid assets are tied up in margins (CGFS, 2001), aggravating the bank run problem.

Monitoring gap

Collateral may introduce a "monitoring gap" with cash lenders having less incentives to monitor believing that collateral is a substitute for monitoring borrowers' creditworthiness (CGFS, 2001, p. 29). Collateral may evoke an appearance of safety. Following the debacle of hedge fund LTCM which had built up an enormous leverage through repos, the Basle Committee has written several reports[148] which among others say that banks had put too much faith in collateral when embarking on hedge funds. Particularly in markets where counterparties are not well known in advance, monitoring with due diligence the volatility of collateral values and frequency with which positions are marking-to-market remains very important because even fully collateralised positions are not without risk.

[146] Such exposures typically last for one day, although in some cases intra-day margin calls can be made.

[147] A haircut is a risk control measure applied to underlying collateral implying that the market value of the assets supplied as collateral is reduced by a certain percentage (haircut). For example, a haircut of 2% implies that counterparties receive cash representing only 98% of the value of the securities supplied as collateral.

[148] These reports entitled "Bank's Interactions with HLIs" and "Sound Practices for Banks' Interactions with Highly Leveraged Institutions" can be found on www.bis.org.

Large banks

If a few very large banks dominate the Euro repo markets it is unlikely that they are price takers. Banks with large positions or market power may at least temporary be able to manipulate prices (bid-ask spreads). Glosten and Milgrom (1985) show that once market participants come to believe that the playing field is not level, they start demanding premiums for selling or discounts for buying as compensation for the perceived risk of being exploited. This leads to bid-ask spreads widening and the costs of trading going up. The subsequent fall in trading volume lowers liquidity and further widens bid-ask spreads. In the extreme, this vicious circle continues until all participants that are being exploited have left the market.

Settlement risks

The European clearing and settlement infrastructure is very fragmented with up to 30 different systems across the EU (Terol and Russo, 2000), hampering the cross-border transfer of securities. The majority of (cross-border) trades are still cleared and settled by domestic systems. Settlement risk related to different timing of settlement of the cash and securities leg in repos can create net debtor or creditor positions (Banking Federation of the European Union, 1999). It is conceivable that net debtor positions exceed bank's capital, rendering it technically insolvent.

Jurisdiction

A risk of jurisdiction is that no distinction is made with regard to the quality of securities in their eligibility for the Eurosystem's open market operations. This means, in other words, that government securities or other Tier 1 assets similar in all other respects but specific to the financial system of say Italy and Germany are considered to have the same credit risk attached for the purpose of Eurosystem open market operations (the official repo market). But GC repo rates are different in private repo markets for underlying government securities as seen in Table 7.2 reflecting among others different credit risks.[149] This makes it attractive for banks to deliver relatively cheap ("bad") paper in NCB open market operations and preserve the more expensive ("good") paper for the private market since there is no corresponding increase in haircuts for

[149] Differences in credit risks of government bonds are also reflected in Standard and Poor's sovereign ratings since the start of EMU: Austria, AAA, Belgium AA+, Finland AA, France AAA, Germany AAA, Ireland AA+, Italy AA, Luxembourg AAA, Netherlands AAA, Portugal AAA and Spain AA).

credit risks (Gresham's law).[150] [151] This "bad" or "cheapest-to-deliver" collateral is usually the weakest eligible government paper with a relatively low credit rating attached.[152] Over time, the soundness of the Eurosystem balance sheet would deteriorate, with possible serious repercussions for the functioning of the interbank money market and the credibility of the Euro. Table 7.3 shows that Belgium and Italian securities are relatively more supplied to the Eurosystem (via the Correspondent Central Banking Model (CCBM) and Securities Settlement System (SSS) links) than would be warranted by their share in the total Euro area government bond market in 1999 and 2000.[153] Notice that this "bad collateral driving out good collateral" phenomenon is stronger in 1999 than in 2000. In contrast, the share of German[154] and French securities is less than their share in the total Euro area government bond market.

Besides due to relative GC repo rate differences, part of this low share for German and French securities is due to the fact that German and French government bonds dominate the market for "special" repos following the success of the Eurex and Matif futures contracts linked to these bonds. Italian government bonds are often used in the "general collateral" segment of the market, because of their high liquidity and the low probability that they become "special" (Ciampolini and Rhode, 2000, p. 16). The Eurosystem's holdings of securities issued in Luxembourg are remarkably high, which is probably due to a combination of low liquidity[155] ("bad" paper) and easy access for banks located in Luxembourg.

[150] Risk control measures are applied to the securities underlying Eurosystem monetary policy operations in order to protect the Eurosystem against the risk of financial loss if underlying assets have to be realised owing to the default of a counterparty. Currently, there are two kinds of risk control measures at the disposal of the Eurosystem: initial margins and haircuts (ECB, 2000d). Initial margins imply that counterparties need to provide underlying securities with a value at least equal to the credit provided by the Eurosystem plus the value of the initial margin. Two different initial margins are applied, taking into account the exposure time for the Eurosystem: a margin of 1% for intraday and overnight transactions; and a margin of 2% for transactions with an original maturity of more than one business day. In addition, the Eurosystem applies specific risk control measures known as haircuts according to the market risks of underlying securities offered by its counterparty. A haircut is a certain percentage deducted from the market value of the underlying securities. These haircuts for Tier 1 and Tier 2 assets are differentiated according to the residual maturity (because the longer the term to maturity, the higher the market risks), but not according to credit quality (see ECB, 2000d, pp. 43-45).

[151] Wiseman (2000) discusses this phenomenon for the UK Sterling money market.

[152] Note that commercial banks are free to choose what eligible collateral to supply to the Eurosystem.

[153] Note that this argument does not apply to Finland and Spain which also have the lowest rating.

[154] Although, only two-third of German collateral securities are government bonds, the rest are Pfandbriefe.

[155] The Eurosystem´s haircuts also do not take liquidity risks of underlying collateral securities into account. Liquidity risk is not the same as market risk.

Table 7.3 Distribution of collateral by country of issue

In %	Distribution of collateral held through CCBM by country of issue, in % of total Euro area issues held through CCBM, December 1999[a]	Distribution of collateral held through CCBM and SSS links by country of issue, in % of total Euro area issues held through CCBM and SSS links, December 1999[a]	Distribution of collateral held through CCBM and SSS links by country of issue, in % of total Euro area issues held through CCBM and SSS links, December 2000[a]	Share of national government bond market in total Euro area government bond market, based on amounts outstanding, end 1999[b]	Share of national government bond market in total Euro area government bond market, based on amounts outstanding, end 2000[b]
Austria	1.9	2.0	1.7	2.9	2.9
Belgium	17.5	16.9	11.7	6.1	6.1
Finland	0.7	0.9	0.6	1.3	1.3
France	2.4	2.8	3.4	17.9	18.1
Germany	17.1	23.0	21.3	27.4	27.4
Ireland	0.0	0.0	0.0	1.0	0.9
Italy	46.0	40.4	34.2	28.7	28.7
Luxembourg	6.7	5.9	18.0	0.0	0.0
Netherlands	3.0	3.1	2.5	5.3	5.0
Portugal	1.2	1.2	1.7	1.3	1.4
Spain	4.5	3.9	5.0	8.1	8.2

Note: Greece is not included in the table because it joined the EMU from 2001 onwards.
[a] Source: ECB, www.ecb.int, shares adjusted for non-Euro area participants.
[b] Source: Eurostat (2001), Money, Finance and the Euro: Statistics Monthly, 2.

The fact that the Eurosystem could become heavily exposed to the paper of just one or two heavily indebted governments entails a worrying, so far largely, unnoticed risk of EMU. Assuming reasonable illustrative magnitudes for the Eurosystem's balance sheet and reasonable magnitudes of sectoral payments imbalances and financing, it would not take many years for the Eurosystem's asset holding to be dominated by claims against the Italian government (or other persistent deficit sectors).[156] At some point, assuming no prior limits to Eurosystem accumulation of national paper, the[157] NCBs in the Eurosystem must become concerned about

[156] Future research intends to investigate the orders of magnitude of deficits and debt flows to illustrate the potential size and speed of debt accumulation in the NCBs balance sheets (see Tables 2.1 and 2.2 in ECB Monthly Bulletin and Kenen 1995, chapter 3 for a first analysis).

[157] NCBs may apply limits or require additional guarantees to their acceptance of Tier 2 assets. However, whether such risk control measures also hold for Tier 1 assets is unclear. There is no mention of such measures for Tier 1 assets in the general documentation (see ECB, 2000d, p. 45-46). Tier 1 assets involve a two-name guarantee (counterparty and collateral) while Tier 2 assets involve a three-name guarantee (counterparty, collateral, and the central bank which has included the asset in its Tier 2 list).

their exposure to weak-performing sectors[158], and would presumably press the ECB to limit new acquisitions of those sectors' paper. At that point the Eurosystem's growing exposure could scarcely be concealed from the markets, however hard the ECB and NCBs would attempt to maintain secrecy. Without guarantees from the System collectively, creditor NCBs would surely be unwilling to have a substantial portion of their assets backed by or tied up in suspect paper.[159] Of course, when banks learn that the Eurosystem hesitates to provide liquidity against the collateral of a particular country, this collateral will be dumped immediately.
Although in theory banks should submit the worst collateral to the Eurosystem, in practice this probably doesn't always happen because such banks would loose their reputation. Also keep in mind that the Eurosystem takes only a percentage of any banking firm's funding so the firm will be left funding the balance in the private market. Or the spread on borrowing lower quality paper primarily to supply to the ECB wouldn't be enough to justify the use of balance sheet for many banks that are balance sheet sensitive.

7.4 The trade-off between competition and stability

Now we are ready to assess the possible impact of increased competition on (in)stability. Increased competition may have both positive and negative effects on (in)stability:

7.4.1 Competition increases trading volume

On the one hand, the increase in repo trading volume increases systemic and contagion problems related to the repo markets' role in facilitating leverage or its role in causing liquidity pressures. The large contract size hampers access of smaller players. In narrower markets large banks face the difficulty of moving the market during large trades (Davis and Steil, 2001, p. 157). On the other hand, systemic and contagion risks may actually decrease because of better resources for risk management at larger banks, better market liquidity and a substitution of unsecured by secured borrowing and lending.

[158] Given the mechanisms of the Eurosystem, persistent payments imbalances between, say, Italy and Germany - meaning a persistent flow of Euro deposits from commercial banks in Italy to banks in Germany - would lead to a persistent draw down of the Banca d'Italia's correspondent account at the Bundesbank and eventually an accumulation of financial claims on Italy by Germany. Thus the claims of the ESCB as a whole on the Italian banking system, and indirectly but implicitly, the Bundesbank's equivalent claims on the Banca d'Italia would be secured by the collateral accumulated by the Banca d'Italia in its operations with the commercial banks in Italy.
[159] Compare this with the Buiter and Sibert (1997, p. 6), Garber (1998b, p. 8) and Dooley (1998, p. 23) in the context of a speculative attack on the euro. Speculators will have no chance to profit by attacking the locked exchange rates of the system in the face of unlimited inter central bank credit.

7.4.2 Competition increases the number of counterparties

The increased number of counterparties may reduce systemic risks for two reasons. First, the increased number of counterparties lowers the concentration in domestic repo markets. Second, the increased number of counterparties enables the diversification across more counterparties, reducing liquidity risks since the possible sources of funding increase (Padoa-Schioppa, 1999).

7.4.3 Competition broadens the diversity of counterparties

The broader range of counterparties may increase systemic risks. If lower-rated participants enter the market (notwithstanding good quality collateral), this increases the probability that a bank is lending to a bad credit risk. The possibility of lending to a bad credit risk may increase substantially the information collection and monitoring burden of banks currently participating (Saunders, 1987, p. 200). The higher burden may necessitate an increase in the minimum efficient scale of banks.

7.4.4 Competition increases the range of securities posted as collateral

Repo participants are expected to deal in a wider range of securities than before. Increased competition may heighten the problems related to the jurisdiction where the securities have been issued, the location where they are held, and the risks embedded in the securities. But repos also enable diversification across a wider range of securities and increase liquidity in securities markets.

7.5 The impact of internationalisation on the trade-off

Internationalisation has been the main trend affecting the repo market, also by choice due to the arrival of the Euro.[160] A survey conducted by the ECB Money Market Contact Group and summarised by Ciampolini and Rhode (2000) reports that cross-border repo transactions have increased substantially since the start of EMU in the majority of countries except in Spain. Also the number of counterparties in private cross-border repo transactions has increased significantly in the Benelux, increased slightly in France, Germany, Italy and the UK, and decreased significantly in Spain. However, the number of counterparties in Eurosystem's MROs has decreased (Santillán, Bayle and Thygesen, 2000, p. 13). De Vidts (2000) reports that more small and medium sized banks entered the cross-border repo market. Although, these new entrants do not necessarily have to be riskier (and also because collateral has mixed effects), the possibility of lending to a bad credit risk may increase barriers to entry, and could result in a further consolidation in the banking industry. Larger banks are better able to carry the increased

[160] Another trend (particularly in the US) is the shrinking supply of Treasury securities due to government budget surpluses. This could increase liquidity constraints and heighten risks (see Schinasi, Kramer and Smith, 2001 for more on the implications of the shrinking supply of Treasury securities for repo markets).

information collection and monitoring costs that is needed to trade with newcomers. The ECB (2000a, p. 42) reports that the size of standard repo deals has increased from EUR 50 million to EUR 100 million. The larger contract size increases the moral hazard effect, but decreases the adverse selection effect. The larger contract size hampers entry of smaller firms since they are less able to handle the large contract sizes. But a shock may have a heavier impact if banks are large and risk management is not adequate. There are few signs of a reduced role that the country of origin plays in securities used as collateral. German, Italian and Spanish banks still have a strong preference (over 90%) for conducting repo transactions on their own domestic securities (mostly government bonds). This makes these banks particularly vulnerable to a drop in collateral value of their own (national) securities. Instead, UK based banks tend to carry out domestic and cross-border trades using the securities of all countries. Still, UK banks' activity is mostly concentrated on the securities with the largest outstanding volumes: German (28%) and Italian (46%) government bonds.

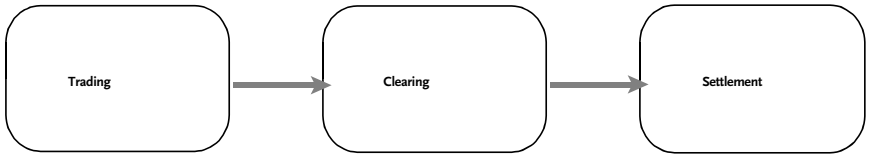
7.6 Policy to influence the trade-off

How can regulators and supervisors increase and deal with competition without endangering stability, recognising that internationalisation of the repo market impacts on this trade-off? Policymakers may try to find a balance between, on the one hand, the objective of minimising systemic risks and contagion in repo markets, and on the other, the objective of minimising the regulatory and supervisory costs for participants to facilitate competitive repo markets. Some possible safeguards and remedies are:

- Clearing and settlement of repo trades is of major importance for the further development of the Euro repo markets.[161] The Eurosystem has an interest in a clearing and settlement of repo trades, because shocks propagate through clearing and settlement systems, for example by causing liquidity problems at banks (see Section 3.3). Clearing covers the activities related to collecting the trade, matching it and transmitting it for settlement. Settlement refers to the final discharge of the obligation to deliver securities or to pay them. The chain of connection is thus from trading to clearing to settlement (see figure 7.3). Settlement of the cash leg in cross-border repo trades forms no problem since cash moves more and more on a real time basis (via Target). However, geographical borders have hampered the movement of securities.

[161] The Giovannini Group has recently issued a questionnaire to examine among others the potential obstacles to cross-border clearing and settlement (http://Europa.eu.int/comm/economy_finance/ giovannini/index_en.htm).

Figure 7.3 The trading, clearing and settlement chain



Bilateral netting is a first step to reduce costs of clearing and settlement. Bilateral netting allows two counterparties' positions to be offset. Only the net amount of securities would be cleared, leaving smaller positions to be settled at the end of the day (Santillán, Bayle and Thygesen, 2000, p. 55). This reduces credit exposures, clearing fees, fails, economic and regulatory capital and back-office costs. The next step would be to net through central clearing counterparties (CCCs) also known as clearinghouses. A CCC provides two additional advantages: anonymity in trading and multilateral netting. CCC places itself between two repo counterparties taking over counterparties' credit risks, custody of the collateral and marking-to-market. A CCC thus homogenises the credit standing of the counterparties and thereby erodes the competitive advantage of the better rated. The amount of collateral is reduced given the greater scope for exposure netting and the ability to offset margin requirements for closely correlated positions. A CCC would also be able to monitor the overall risk position of its members (Terol and Russo, 2000, p. 12). A merger or alliance between London Clearing House, Euronext and Eurex repo would maximise the scope for the netting of repos.

- The various repo markets in EMU work under different legal provisions affecting the re-use of collateral securities. This is no longer appropriate. Legal uncertainty must be out of the way to further develop collateral use. CEPS (2000, p. 35) writes: "The most important element to strengthen legal certainty in the repo market is that a repurchase agreement should be recognised legally as an outright transfer, rather than a securities interest." Doing so ensures that the owner of collateral will have the legal rights to title, that is, ownership of the collateral (Morton and Potok, 1999). This is important in situations that require the prompt liquidation of a bankrupt party's positions to prevent that the insolvency of one party triggers the insolvency of

other parties. Holders of securities collateral should be immune from attack by the insolvency-officer of an insolvent collateral provider. The European Commission (2001) has just proposed a new Directive to create a uniform minimum regime for the provision of securities and cash as collateral in the EU to complement the Settlement Finality Directive (Turing, 1999). The European Commission (2001, p. 6) writes: "The functioning of markets will be improved because the opportunities for conducting cross-border business will increase, creating a more competitive European financial market. This is particularly the case for small and medium sized financial entities if they receive collateral in which they have confidence. Stability will be enhanced because proper use of collateral will reduce the risk that a failure of one participant will cause other participants to be unable to meet their own obligations. The proposed Directive, in particular the provisions allowing the re-use of pledged securities, will moreover enhance the liquidity in the market, thus reducing volatility and enabling investors to buy or sell securities more easily at a fair price." This Directive should be adopted by the EU member states in 2003. Once implemented in national regulation, it is legally binding.[162] Of course, the other way to achieve legal certainty is self-regulation by market participants. Repo trades should be enforced on standard legal documentation. The European Repo Council is working on a legal comparison between the European Master Agreement and the TBMA/ISMA Global Master Repurchase Agreement (GMRA).

- The role of the Eurosystem is vital for the further development of the repo market. Top-up collateral should be required upon deterioration of the credit quality of collateral held by the Eurosystem. Haircuts should not only take market risks but also credit risks of underlying collateral into account. This would solve the problem of bad collateral driving out good collateral. But, distinguishing on credit risk of securities supplied in the liquidity operations of the Eurosystem might be politically unfeasible.[163] The Eurosystem has probably realised the political sensitivities that this measure would entail, and has set the haircuts for market risks higher to include also any credit risk inherent within market risk of underlying securities. For example, the haircuts are at least twice as large than comparable haircuts for market risks applied by the Bank of England (2000). In addition, the application of very strict limits on the supply of

[162] The CEPR (2000, p. vii) writes: "Governments still have a strong sense of national identity and the unwillingness to create a level playing field reflects in part the political dimension, since these obstacles serve to protect domestic institutions and markets from outside competition. At the EMU level however a vacuum exists because the ECB does not have a legal mandate to pressure national governments for harmonisation."

[163] Garber (1998b, p. 14, footnote 7) writes: "The ECB will have the power to impose a differential haircut on discount operations involving securities of individual countries or even to terminate accepting them as collateral for overdrafts for discounting. Such differential action against an individual state's securities is inherently a political decision that cannot suddenly be imposed, and the anticipation of its possible imposition can of itself trigger an attack. Also, terminating the use of a given country's securities as collateral for overdrafts would cut off its national payment system from the other member states of the Union, thereby causing a float of the country's euro."

securities is probably politically unfeasible as well.[164] A solution would be for the Eurosystem to mimic the pricing of collateral in the market. The procedure could be similar to that of the Federal Reserve Bank of New York (FRB of New York).[165] In the morning the FRB of New York phones up a few of its primary dealers for their repo rates to determine the most recent spread between best and worst collateral (based on the various collateral classes i.e. Treasuries, Agency debt and Mortgage Backed Securities). Subsequently, the FRB of New York applies the official repo rate for the best collateral and the worst repo rate for all other collateral. This changes the incentives in the market. Market participants start searching for the best collateral to supply to the Eurosystem.

7.7 Conclusion

This chapter illustrates the trade-off between competition and stability in Euro repo markets. The mere size of the Euro repo markets and its potential growth imply that small efficiency improvements may yield substantial welfare gains. Increased competition in terms of higher trading volumes, more players, a greater diversity of counterparties, and broader range of securities will potentially increase this efficiency in the Euro repo markets. In this connection, policy can merely act as catalyst for change. For instance, cross-border growth of repos depends on reducing the costs of each transaction. In order to lower costs, there is a pressing need to standardise market practices and to consolidate the various systems for clearing and settlement into one system. Lower costs would encourage entrance of new participants and increase the willingness to use repos. Repo markets would become more stable and would less likely be a source of shocks. Increased competition, however, may also lead to systemic and contagion risks. This holds especially in an environment with legal uncertainty and careless risk management. Hence, promoting competition for liquidity through cross-border repos without having sufficient regard to these risks may be problematic. The dangers of systemic risk and contagion seem to be most serious in the first years of EMU. Indeed, once a more mature repo market structure has emerged, the problems are likely to be less severe. The proposed Directive by the European Commission may form a viable backstop to these risks. Deepening the repo markets by ignoring out national idiosynchrasies in the treatment of collateral would be a good thing. The trend of internationalisation could lead to bad collateral driving out good collateral. The haircuts set by the Eurosystem should not only take market risks but also credit risks of underlying collateral into account. The Eurosystem should try to mimic the pricing of collateral in the market.

[164] Kenen (1995, p. 72) recommends that "[...] the ECB may wish to adopt broad guidelines aiming at some sort of balance in the composition of total ESCB assets. It may want to avoid the appearance of preferential treatment."
[165] The FRB of New York conducts open market operations on behalf of the Federal Reserve System.

8 Concluding remarks

A number of sub-markets in the Dutch banking sector are characterised by a tight oligopoly. In such markets, competitive forces tend to be weak. From that perspective, it is likely that intensified competition among banks will yield efficiency gains. Policy may contribute to this, for instance, by reducing entry barriers and increasing transparency.

Due to the pivotal role of banks in the financial system, however, larger size and concentrated market structures may be justified on grounds related to financial stability. Moreover, banking is characterized by several market failures that call for public intervention.

Yet, there is not much in the empirical evidence to suggest that market power and concentration are the indispensable stabilisers. Moreover, not all forms of competition are harmful for financial stability. For instance, competitive shocks and new market entry could indeed have serious adverse implications for financial stability. However, a gradually more intense competition among incumbent banks is unlikely to be a serious threat to financial stability. The same holds for entry coupled with prudent regulation.

The changing environment in which banks are operating intensifies competition. For instance, deregulation as well as financial and technological innovations have blurred market boundaries that, until recently, shielded the banks' business from the business of other financial institutions or non-financial companies. Moreover, entry costs may be substantially lowered through the Internet while electronic commerce and electronic banking affect the delineation of both geographic and product market boundaries.

If competition intensifies, does that lead to an increasing threat of instability? Sometimes this might be the case, but more often it is not. The potential threat to stability could often be dealt with in an efficient way by means of prudential regulation and supervision. Indeed, intensified competition often accentuates the importance of prudential regulation and good corporate governance in banking. Intense competition should not be impeded in the cases where it does not threaten stability.

This study develops an analytical framework to explore how increased competition affects financial stability. In particular, the framework comprises a number of steps that should be taken to fully understand (i) how competition and stability interact, (ii) how trends affect competition, stability and the trade-off between them, and (iii) what are the policy options in response to the trends. The framework forms the basis for three illustrations in the study. First, we look at retail banking in the Netherlands. This is a straightforward choice since there seems to be opportunities to increase competition without endangering stability. The second illustration is on corporate governance in banking, which receives due attention in recent international debates. Finally, we explore the Euro repo markets, which are chosen because of the rapid changes that take place, and the enormous size of the sector.

Can competition in retail banking go hand in hand with financial stability? Yes and no. There are some threats: large scale entry by unknown firms (e.g. Internet firms) can threaten confidence and can lead to excess capacity. Bankruptcy in normal businesses can be interpreted as a healthy selection mechanism. With banks this is trickier since a reduction of confidence endangers stability. Gradual entry and prudential regulation can tackle that danger.
Less threatening for stability is intensified competition between existing banks. The aim of the new Basel capital accord to improve transparency is therefore to be applauded. Other policies aimed at achieving more intense competition among current players deserve further exploration. Here, one can think of enforcing number portability.

Another possible way to stimulate competition is by limiting cross-shareholdings between banks. In particular, the mode and effectiveness of corporate governance is closely linked to who owns and controls a corporation. The leading European banks are linked up with other financial institutions, in particular insurance companies, and non-financial firms. These links occur through cross-shareholdings, unilateral equity participations and the presence on respective supervisory boards. This complex system of direct and indirect relationships makes these banks informationally "opaque", that is, it makes them intransparent to outside investors. Further, the members of such a network are effectively shielded from hostile takeover attempts. Thus, there is little incentive for outsiders to engage in monitoring. Therefore, regulators have to fulfill the important task of checking and influencing the way banks are governed.

With respect to the interbank market, the study demonstrates that repos can protect banks from systemic risks and contagion. The mere use of collateral can reduce propagation, as it serves to minimise a potential loss. In addition, repos enhance market liquidity. The credit risk protection provided by collateral and the right to call for margin moderate the tendency of suppliers of liquidity to leave the repo market in times of stress. Stimulating cross-border activity is crucial for the further development of the Euro repo markets. The presence of collateral in repo transactions, however, make the Euro repo markets sensitive to national differences. The discussion highlights two imperfections related to the fragmented clearing and settlement infrastructure in the euro area and how the Eurosystem deals with differences in the quality of collateral in its open market operations. In order to lower costs of cross-border repos, there is a pressing need to standardise market practices and to consolidate the various systems for clearing and settlement into one system. In this respect, policy can merely act as catalyst for change. But the Eurosystem should prevent bad collateral from driving out good collateral by mimicking the pricing of collateral in the private repo market.

Although at present there is a healthy degree of competition in the Euro repo markets, one should continue to watch the degree of competition in Euro repo markets. In the future, the consolidation in the financial sector, the inherent barriers to entry and the scale effects in repo markets could result in a limited number of suppliers of liquidity. This could lead to certain

negative externalities such as increased risks of liquidity shortages, excessive prices for users of liquidity and unjustified barriers to entry for new suppliers of liquidity.

One challenge regarding the trade-off between competition and stability lies in the institutional framework. In most countries, including the Netherlands, competition authorities are responsible for merger control and collusion while the Central Bank is responsible for financial stability. There is no institution that weighs the two goals of competition and stability. We do not want to suggest that the potentially conflicting goals of competition and stability issues should be the responsibility of one single institution, though. Indeed, designing a transparent and accountable institutional framework might be better served by delegating conflicting goals to different institutions. However, this does not preclude that institutions have regard for secondary goals. In particular, in an alternative institutional setting, the financial sector regulator can be committed to the goal of competition in the sense of establishing and maintaining a competitive order when pursuing its prudential objectives. The Financial Services Authority (FSA) in the UK can be regarded as a role model in this respect. The FSA has four “objectives”. These are related to market confidence, consumer protection, public awareness, and financial crime. Furthermore the FSA must, while discharging its general functions, have regard to the "principles of good regulation". This is were competition concerns kick in because among these principles are "facilitating competition" and "minimising adverse effects on competition". It is important to note that the principles of good regulation are less important than the objectives. Nevertheless the Director General of Fair Trading must report to the Competition Commission, the Treasury and the FSA any regulating provision or practices that it considers to have a significant anti-competitive effect. So there is strong external scrutiny. It seems to be a no-regret policy when regulators have to take account of the anti-competitive consequences of their own regulations. The Dutch central bank does now seem to move in that direction by running a pilot for a Regulatory Impact Analysis in which the effects of regulation on competition-sensitive aspects are explicitly incorporated in the assessment of new regulation.

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Abstract

More competition among banks typically enhances the welfare of consumers. However, it may also involve a threat to financial stability, that is of vital importance for the functioning of economies. This study reveals that many forms of competition do not endanger financial stability, however. For instance, intensified competition among incumbant banks usually has little impact on financial stability. Moreover, in cases where competition does affect financial stability, the latter might best be safeguarded by sound prudential regulation or good corporate governance.