The Banking Firm, Competition and Growth:
Overview of the Literature

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Abstract

The existence of a finance-growth nexus has drawn the attention of many economists, from Schumpeter to our days. Up to the seventies, there was no real microeconomic theory of the banking firm. The work of Klein (1971) opened the way for a vast literature on the microeconomics of the banking industry. In formal macroeconomic theory, however, for most of the past decades, the financial sector was greatly ignored. In the presence of perfect markets, as in the traditional Arrow-Debreu model of resource allocation, the financial sector would play no significant role.

Developments in the study of the microeconomics of banking, building on the new industrial organization approach and/or on the imperfect information paradigm, have slowly been introduced in macroeconomic theory. Developments in growth theory have also brought new insight into the finance-growth nexus.

Recent empirical studies, such as Shaffer (1993), Molyneux et al (1996), Bikker and Groenweld (2000), De Bandt and Davis (2000) and Corvoisier and Gropp (2002), have shown that the banking sector in many countries is characterized by imperfect competition, especially in the case of European countries.

In the present study, which does not intend to be extensive, we will pay a particular attention to competition in the banking sector and its relevance to the relationship between finance and economic growth.

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1. Introduction

The literature on banking is very vast. However, much of the research on banking, until recent years, has been essentially on the microeconomics of banking. In formal macroeconomic theory, for most of the past decades, the “financial sector has occupied a rather secondary position” (Santomero and Seater, 2000). “For a long time, the design of the financial sector was thought to be of no major importance for economic decision making because in the presence of perfect markets, the financial sector produces nothing but a veil on the true determinants of economic developments” (Thiel, 2001).

The neoclassical framework developed by Patinkin (1956) limited the financial sector to the demands and supplies of money and bonds, in a way that there was not an important role assigned to financial institutions. Financial institutions were considered to play a minor role in the subsequent research of authors such as Brunner and Meltzer (1963) and Tobin (1969).

“In the traditional Arrow-Debreu model of resource allocation, firms and households interact through markets and financial intermediaries play no role. When markets are perfect and complete, the allocation of resources is Pareto efficient and there is no scope for intermediaries to improve welfare” (Allen and Santomero,
1998). Such a view that intermediaries have no role to play in the economy is certainly extreme and “clearly at odds with what is observed in practice” (idem). It was the introduction of frictions such as transaction costs and asymmetric information in the intermediation theory that allowed for a better understanding of the role or roles played by intermediaries in the financial sector.

A study by Bernanke (1981), showing that a reduction in the banking sector’s ability to perform its evaluation and monitoring role might have been an important factor in the events of the Great Depression, marks a change in the role of financial institutions for the aggregate economy. Insights of banking and intermediation literature were then slowly introduced into macroeconomic analysis, as in Bernanke and Gertler (1989, 1990). The importance of the monitoring function undertaken by financial institutions, in macroeconomic analysis, was also established by the early research of authors such as Leland and Pyle (1977), Diamond (1984), and others.

The importance of the financial sector for real economic activity is now more widely accepted among researchers, and financial intermediaries have found a relevant role in macroeconomic theory.

In general, one may 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. This function, comprehending the provision of liquidity, risk-sharing, and information gathering and communication, can be performed by financial markets, matching savers and borrowers directly, and by financial intermediaries, matching them indirectly. Intermediaries exist because transaction costs of intermediated exchange are lower than the costs of direct transacting between market participants. Intermediaries, for example, may acquire information at a lower cost (search costs, verification costs, monitoring costs, enforcement costs) due to specialization and economies of scale and scope.

The functions performed by banks and usually identified by contemporary banking theory can be summarised in four main categories: offering access to a

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payment system; transforming assets; managing risk; and processing information and monitoring borrowers.

Banks are special for a number of reasons. They do not produce any physical good, instead they provide means for production. “Banks trade in financial contracts (loans and deposits) which are not easily marketed or marketable” (Canoy et al, 2001). Moreover, there is a qualitative and quantitative difference between inputs and outputs of the banking firm. Deposits are securities with short maturity, with no size restrictions and entail low risk, whereas loans are of longer maturity (more illiquid), have larger sizes and are subject to credit risk. In sum, banks borrow short (from savers) and lend long (to borrowers). Banks are also special because they may benefit of economies of scale, due to organisational fixed costs, and of economies of scope, through the joint provision of deposit and credit activities. Asymmetric information is particularly pronounced in banking, raising the potential for market failure. Problems of adverse selection, moral hazard and agency problems abound in the banking industry. A final important feature of banking, worth referring, is that the failure of one bank can be contagious and spread to other banks.

In the financial sector, one may easily observe a certain number of barriers to entry and exit. Entry to the financial sector, in particular to banking and insurance, is regulated in many countries. In some countries, for example, certain types of banks may receive preferential treatment. There may also exist regulatory barriers to entry for foreign competitors, such as authorisation for doing business requiring to set up branch headquarters and branches in the host country. Substantial investment is usually required for entry to the financial sector, and this investment tends to be sunk to a high degree. Investment in building up customer goodwill and reputation may not be reversible upon exit and thus have to be recouped in the market. Incumbent banking firms may have a cost advantage over potential entrants which can deter entry. Besides, a minimum efficient horizontal, vertical or conglomerate size may be necessary for banks to be economically viable in the presence of economies of scale or scope. One can also refer costs of switching between banks, such as the fact that account numbers and transaction data can not just be transferred to the new bank.
The growing differentiation of products and services may also make more difficult comparisons of prices and services between financial players. Finally, given that the stability of the financial system may be endangered by a bank failure, there may also be restrictions to exit, preventing the exit option.

There are several reasons to study the behaviour of financial intermediaries and markets, some of which can be found in what has just been exposed. In this paper we will begin by reviewing some important contributions in the field of microeconomics of banking. We will focus particularly on early contributions which opened the way for the vast literature on the microeconomics of banking that exists today. It is not in the scope of our present work to do a comprehensive survey on this literature. Banking theories have developed based on two approaches: the incomplete information paradigm and the industrial organization approach to banking. We will pay more attention, in the next section, to the latter, as we have a particular interest in imperfect competition issues.

Later on this study, a special emphasis will be given to the finance-growth nexus, and to the relation of competition in the banking industry and growth. Some evidence on the banking industry will also be mentioned in the present article.

2. The Microeconomics of Banking

“In many countries, financial structures show a high market concentration (...) This constitutes a source of concern for the degree of competition, for the behaviour and market power of the intermediaries and for the optimality of financial market results (...)” (Verheirstraeten, 1981, p. xvii).

In his book, Verheirstraeten refers to inefficiencies in the financial sector, and one of the examples given are the inefficiencies which may derive from the financial market structures (partly determined by the applied systems of regulations), which may induce “oligopolistic behaviour and give eventually an opportunity to the intermediaries to realise excess profits” (Verheirstraeten, 1981). He chooses the case
of Belgium as an example of a country where concentration in the financial sector is very high, believing that an explanation for such a fact should be sought in the existence of economies of scale.

This statement of Verheirstraeten also comes as an argument for a deeper study on the structure-behaviour-performance relationship and its change over time, so as to evaluate whether a more appropriate regulation of the financial sector is needed, or rather a deregulation.

Up to the beginning of the seventies, banks were viewed mainly as rational investors, rather than firms, having to decide upon their portfolio investments. Portfolio theory was then dominant when dealing with the banking sector. However, since then, this approach has widely been abandoned in favour of more formal microeconomic approaches to banking. In fact, most of the literature on banking today considers banks as firms in a microeconomic theoretical framework, and the adaptation to banking of the conventional industrial organisation theory is now a very common practice. In the next section, we will make a brief overview of the theory or theories of the banking firm, keeping in mind that developments in the field of micro bank modelling have not followed a nice and smooth continuum. As stated by Santomero (1984), “individual questions attract attention and are the subject of a substantial number of contributions. After a time, the field moves on to the new area of interest”.

The literature on the microeconomics of banking is very vast. Our intent in the present section is not to provide a fully comprehensive review on that literature, but rather to give the reader some insight on the theories of banking which have dominated the area in the last decades. One should, however, refer some very important reviews on the modelling of the banking firm: the first done by Pyle (1972), who focused on uncertainty portfolio models which were dominating the then scarce literature on banking; the second, done by Baltensperger (1978, 1980), which is rather more extensive; thirdly, the contribution of Santomero (1984), which is an essential reading for anyone interested in deepening this area of economic
literature. Building on Santomero (1984), Bhattacharya and Thakor (1993) have provided an excellent survey of the current state of the literature on banking. One can also refer another survey, by Gilbert (1984), different in scope, providing a very good review on the empirical writings on bank market structure and competition. Worth referring is also the book on the “Microeconomics of Banking” by Xavier Freixas and Jean-Charles Rochet (1997).

2.1. An important benchmark: Klein’s contribution

Klein (1971) was one of the first contributors to the literature of banking in a microeconomic approach with his paper “A theory of the banking firm”. In a time where there was little consensus as to what could be considered a workable and productive theory of the banking firm, Klein proposes a theory of banking with monopolistic relationships.

Up to his study in 1971, most of the work related with financial institutions was done under the approach of portfolio theory. Although the research done in the light of the Markowitz-Tobin portfolio theory may have the advantage to treat uncertainty in an explicit manner (see, for instance, Pyle (1971)), key aspects concerning the financial firm are ignored. The models of Parkin (1970) and Hart and Jaffee (1974) are examples of portfolio models, considering competitive relationships in the loan market. The model of Goldfeld and Jaffee (1970) has the same competitive characteristic, but with a focus on the deposit market. One of Klein’s criticisms on portfolio theory lies on this assumption of competitive loan and deposit markets. As a matter of fact, in Klein’s perspective, imperfectly competitive markets are a reality to the banking system, and if this is taken into consideration, the applicability of some basic theorems of portfolio theory is questionable. However, the main criticism, which should be made on this theory, is the lack of specification of the production and cost constraints faced by financial intermediaries. Modelling the banking firm ought to make further use of microeconomic methods of analysis,
and a particular attention should be given to the new developments in the field of industrial organisation.

The paper by Klein (1971) was thus an important starting point (or one of the most important ones) for discussing the bank behaviour within the framework of the theory of the firm. As referred by Sealey (1980), “Klein was among the first to question the applicability of the portfolio approach to intermediary behaviour”, and he decides to propose an alternative theory for the modelling of financial institutions. As a subset of financial intermediaries in general, Klein distinguishes banks by their capacity to attract one source of funds, “demand deposits” (current account deposits), without the payment of explicit interest. In this context, “demand deposits” are a service provided by the banking system to the non-banking public, due to being a medium of exchange with general acceptance superior to currency itself, which, in turn, does not have an explicit yield either.

Important to note is Klein’s view on the importance of “demand deposits” in the bank’s profit. He believes this sort of deposits contributes more strongly to profits, and yet they only have an implicit return (recall the prohibition to pay explicit interest on this type of deposits, in the U.S., due to the Regulation Q), while “time deposits” have an explicit one. Another point worth noting is that, in his model, current account deposits are mainly considered an unique service provided by the banking firm, a service charged to the bank’s clients, given the costs, reflected in labour and capital resources used, involved in providing the service. An implicit return to current account deposits was, however, common, in the form of a preferential treatment to customers, namely in what concerns loan agreements, among other forms of price concessions.

Klein addresses the problem of the “demand deposits” market as one of local market structure. He considers that, unlike savings deposits, current account deposits

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2 Note that in the U.S.A., after 1933, banks were prohibited from paying interest on current accounts, see Mishkin (1995, p. 46)

3 This will be issue of criticism by Sealey and Lindley (1977), who believe deposits should be considered an input to the banking firm, and not an output.
are local in scope, since the proximity to the bank is essential due to the transactions purpose of this sort of deposit, making it difficult for depositors to switch from one bank to other which is competing nonlocally. This allows banks not to always reduce service charges significantly. The technological changes in banking (such as the existence of ATM machines) in the last almost thirty years, since Klein’s publication, would certainly change Klein’s line of argument in this issue.

“Time deposits” (savings accounts), “demand deposits” (current accounts), and ownership claims constitute the funds which the financial firm has available for investment in earning assets. Klein stresses the fact that assets such as government securities are in perfectly elastic supply to the individual bank, while private securities (loans) are not. Therefore, an increase in the loan/asset ration can only be done at the expense of a reduction in the marginal return on loans.

The banking firm is assumed to maximise its expected rate of return on equity. Funds are equal to the equity originally invested in the banking firm plus the funds borrowed through deposits (of various types, earning different interest rates). Cash, a government security, and loans are the asset universe of the bank.

Klein does not consider reserve requirements in his model. He assumes borrowers to be identical and the default risk is taken to be exogenous to the bank. If this default risk is positive, then the expected return on loans will be lower than the contract rate of interest on loans. Klein also takes into account the fact the deposits (as well as loan repayments) are by nature subject to random shifts without notice. For instance, an unexpected deposit loss, which causes the exhaustion of the bank’s cash holdings, may require the immediate liquidation of certain assets. Government securities are the asset with the most appropriate characteristics to fulfil this need. The model views as random the price of government securities and, as a consequence, also the holding period rate of return is random. One of the bank’s decision variables is, thus, the proportion of total assets to be constituted by this type of securities.

In what concerns cash holdings, holding cash actually yields an implicit return, by avoiding the possibility of cash deficiency. “Cash is held for precautionary
reasons”, for the bank could be penalised if it could not meet its disbursements. The
bank’s cash management policy must take into account that there are unforeseen
contingencies which, as argues by Klein, cannot be neglected, namely “the
possibility that, for a period of time a net outflow of deposit funds will occur”.

In the liabilities side of its balance sheet, the bank includes two types of
deposits: ‘demand deposits’ and ‘time deposits’. As mentioned before, the bank
provides a service to depositors when issuing ‘demand deposits’, and, consequently,
incurs in a cost. The supply schedules of both kinds of deposits are assumed
increasing functions of the respective returns.

Klein concludes that the proportion of total funds allocated to loans “is
chosen at a point at which the marginal return on loans is equal to the average (and
marginal) expected return on government securities”. Cash, in turn, is held “until its
marginal (implicit) return is equal to the expected return on government securities”.
He completes the solution for the bank decision variables by calculating the interest
rates (implicit and explicit) paid by the bank to its depositors. As pointed out by
Santomero (1984), the model of Klein “seeks to obtain an optimal loan and/or asset
size from the maximisation of expected profit of the firm”, and is taken to view the
bank as having “some degree of monopoly power over its loan price”. One market is,
however, perfectly competitive: the government security market. This approach of
considering one market as competitive seems to have been initiated in 1958 by
Tobin. Other portfolio choice models of asset allocation, such as Schull’s model
from 1963, exhibit a typical structure where there is a two-sided discriminating
monopoly (marginal revenue equals marginal cost).

The model presented by Klein (1971) is a single-period optimisation problem.
It is worth to note, as does Santomero (1984), that most of the models of the banking
industry do not include intertemporal demand considerations. The same can be said
about multiperiod firm maximisation which is “only peripherically treated” in some
of those studies. Some of the few that do approach time considerations assume an
objective function of the firm which is a multiperiod discount valuation function.
As mentioned by Santomero (1984), the loan market decision in Klein’s model reveals monopolistic relationships. Other authors have assumed competitive, sticky or even tied-product relationships in this market. In what concerns the deposit market, an infinitely elastic market from which an unlimited quantity of funds may be obtained is assumed. The bank “is a deposit rate setter with some monopolistic control over the deposit market” (Santomero, 1984). As a consequence, “marginal cost of funds from each deposit must equal the marginal cost (use) of funds from the competitive market” (idem).

This perspective is, however, contested by Flannery (1982) who notes that deposits may not be fully variable factors of production. In his paper, he makes reference to the Regulation Q, which was no more than the setting of ceiling interest rates that banks could pay on savings deposits, imposed by the Federal Reserve System, in the U.S.A.. This law was in force until 1986 (see Mishkin, 1995, p.46). Flannery refers two periods recent to his work when these ceilings were not binding, and yet “banks paid retail deposit rates considerably in excess of the rate at which they could borrow via large, unregulated certificate of deposits”. In order to reconcile these observations with the bank profit maximisation (cost minimisation) at the heart of neoclassical bank modelling, Flannery admits the hypothesis that retail deposit accounts should be “interpreted as ‘quasi-fixed’ (...) inputs to the banking firm”.

For the purpose of this discussion, Flannery set up a “simple two-period model of bank liability selection”. In this model, the payment of “excessive” deposits may well be the result of a rational behaviour by the bank who wishes not to lose established accounts in future periods. The bank need for loanable funds is a plausible justification for the bearing of deposit accounts setup costs and for the payment of interest on those funds attracted, be it implicit or explicit interest. The bank’s objective, finally, is to maximise the net present value of profits over its two-period planning horizon. What might be concluded is that when those above customer-specific costs are shared by both the customer and the bank, there will be a smaller variation on deposit rates than in the respective rates realised in the open-market. As noted by Santomero (1984), by using a quasi-fixed production
technology, Flannery finds an explanation for the “concept of ‘core’ deposits”. Other authors, referred by Santomero, such as Michell and Startz, have considered as essential in encouraging deposit balances the bank’s ability to subsidise banking activity, such as check cashing, funds transfers, and account maintenance costs.

Although the reader might already have the feeling that an excessive weight is being given to Klein’s contribution to the theory of the banking firm, we must stress our view that his work was essential for the present state of this theoretical field. His research has been, as most natural in economic science, criticised by some authors. We will, thus, refer a few of those criticisms in the following paragraphs.

Graddy and Kyle (1979) consider that the bank decision-making is characterised by simultaneity, namely in the decisions over bank input, output, and pricing. In their opinion, Klein has “virtually...” precluded “... the interdependence of the lending and deposit decisions”, by simply failing to “specify a loan production function”. Klein, they argue, has treated in an independent manner the two sets of decisions. And they oppose this approach with that of Pyle (1971) where these decisions are considered not to be made independently, for assets and liabilities have different maturities and holding periods. These authors, consequently, have specified and tested a simultaneous equation model where bank input and output decisions were considered as dependent on one another. This study has been, in turn, criticised by Gilbert (1984), on the grounds that some of the equations tested “include variables that bias the coefficients on market concentration towards zero”.

A similar sort of criticism had also been done by Sealey and Lindley (1977). Given that the optimisation condition obtained by Klein did not include neither the costs of deposits nor the parameters of the deposit supply function, he reached the straightforward conclusion that neither of them can affect asset selection. In their model, however, Sealey and Lindley have shown that “for financial firms, like other firms, input and output decision, i.e. asset and liability decisions, are not independent but are related through the production function of the financial firm. (...) Klein’s conclusion (...) is not possible under any positive cost conditions”.

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Not only by the new ideas of his own work, but also by the ideas which he awoke in other researchers (counting criticisms as well), Klein was, in our opinion, fundamental for the development of the field of banking microeconomic theory.

2.2. Deposits: input or output?

“... the delineation between the outputs and inputs of financial firms creates some conceptual problems; however, Sealey and Lindley [1977] have shown that this difficulty can be overcome by making a clear distinction between technical and economic production” (Graddy and Kyle, 1979).

Previous to their work, various authors have used as outputs of financial institutions: “total assets, earning assets, total deposits, demand deposits, the number of deposit and loan accounts, gross operating income and/or combinations of these measures” (Sealey and Lindley, 1977). They seemed to have failed, in their opinion, to distinguish between the technical and economic aspects of production for a financial firm.

The transformation process faced by a financial firm is financial intermediation which, as defined previously, involves the borrowing of funds from those who have surplus of funds and the lending of those funds to those with a shortage of funds. Basing their argument on the work of Frisch, Sealey and Lindley (1977) consider that production in an economic sense requires that the products created be more highly valued than the original input elements. The services received by the depositors, although technically produced, cannot be taken as the output of the firm. Instead, those services are “more appropriately associated with the acquisition of economic inputs” (idem), for the bank is actually incurring in a positive cost in providing them, without receiving any direct revenue. All those costs should not be considered more than “a partial payment for an input” (ibidem).

Sealey and Lindley believe that “firm behaviour, financial or otherwise, must be studied from a methodologically consistent approach if the theory of the financial
The financial firm is assumed to have a multistage production process (with some intermediate outputs) which final goal is to produce earning assets using loanable funds borrowed from depositors, capital, labour and material inputs. The appropriate concept of output of the banking firm is, therefore, “the services provided to the debtors of financial institutions” (Sealey and Lindley, 1977).

2.3. Industrial Organisation Approach to Banking

For a long period in economic literature, financial intermediaries have been ignored as independent entities that optimally react to their environment. In macroeconomic theory, the banking sector was usually considered as a passive aggregate. The truth is that until the 1970’s, as we have noted, we did not have a true microeconomic theory of banks. The developments in the study of the economics of information and the approach of the new industrial organisation theory to the banking sector allowed this reality to change, leading to a vast research in the microeconomics and macroeconomics of banking.

Under the Arrow-Debreu paradigm, as shown by Freixas and Rochet (1997), “banks are redundant institutions”. Assuming complete financial markets, if firms and households have unrestricted access to perfect financial markets, then at the competitive equilibrium: banks make a zero profit; and the size and composition of bank’s balance sheet have no impact on other economic agents.

This result is truly disappointing and, by relegating banks into a position of relative unimportance in economic modelling, the complexity of banking activities and their observed importance in real economies is simply neglected.

The justification for the existence of financial intermediaries must lie elsewhere. Research on the banking sector has led to two (complementary) approaches of modelling financial intermediaries:
• The incomplete information paradigm, which shows why financial markets cannot be complete and explains why financial intermediaries exist.

• The industrial organization approach to banking, where competition issues are analysed, in particular by considering that market power exists either in the credit market or in the deposits market, or both. Imperfect competition issues in the banking sector dominate this line of research.

Freixas and Rochet (1997) analyse the competitive equilibrium in the banking sector, the Monti-Klein model of a monopolistic bank and its oligopolistic version, double Bertrand competition and monopolistic competition in banking. In this section we will focus on the oligopolistic version of the Monti-Klein model. Gomes (2004a, 2004b and 2004c) will develop macroeconomic general equilibrium models with oligopolistic banks, where understanding the Monti-Klein model is fundamental.

The Oligopolistic Version of the Monti-Klein Model:

“(…) the main interest of the Monti-Klein model is that it can easily be interpreted as a model of imperfect (Cournot) competition between a finite number N of banks, which is a more accurate description of reality” (Freixas and Rochet, 1997, p.59).

Consider we have \( n \) banks in the economy \((i = 1, \ldots, n)\) and that, for simplicity, we assume they have the same cost function, taken to be linear:

\[
C_i(D, L) = \chi_L L + \chi_D D, \quad i = 1, \ldots, n.
\]

Banks are confronted with a downward sloping demand for loans \( L(r_L) \), where \( r_L \) is the interest rate on loans, and an upward sloping supply of deposits \( D(r_D) \), where \( r_D \) is the interest rate on deposits. The banks’ decision variables are \( L \)

\(^4\) Monti (1972) and Klein (1971).

\(^5\) We will follow Freixas and Rochet (1997) very closely.
(the amount of loans) and $D$ (the amount of deposits). We assume that the bank takes the interbank interest rate $r$ as given, either because it is fixed by the Central bank or because it is determined by the equilibrium rate on international capital markets.

The profit of each bank in the economy is given by:

$$\pi_i = r_i \left( L_i + \sum_{j \neq i} L_j \right) - r \left( L_i + \sum_{j \neq i} D_j \right) - C(D_i, L_i)$$

Each bank $i$ will maximise profits, taking the volume of deposits and loans of other banks as given. Banks are obliged to keep a proportion $\sigma$ of their deposits as non interest bearing reserves. The budget constraint each bank faces is given by:

$$M_i = (1-\sigma)D_i - L_i \quad \text{where} \quad M_i \quad \text{is the net position of the bank on the interbank market}\,^6.$$

There will be an unique equilibrium, in which each bank sets $D_i^* = \frac{D^*}{n}$ and $L_i^* = \frac{L^*}{n}$. The first order conditions for this problem are:

$$\frac{\partial \pi_i}{\partial L_i} = r_i \left( L_i^* \right) - r = 0 \quad \text{and} \quad \frac{\partial \pi_i}{\partial D_i} = r \left(1-\sigma\right) \left( \frac{D^*}{n} - D_i^* \right) - r = 0$$

These first order conditions can also be rewritten as

$$r_i = \frac{r + \chi_L}{1 + \frac{1}{n \kappa_i (r_i^*)}}$$

$$r_i = \frac{r \left(1-\sigma\right) - \chi_D}{1 + \frac{1}{n \kappa_D (r_D^*)}}$$

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^6 We should note that the aggregate position of all banks on the interbank market has to be zero.
where \( \varepsilon_L(r_L^*) \) is the elasticity of demand for loans with respect to the interest rate on loans, and \( \varepsilon_D(r_D^*) \) is the elasticity of supply of deposits with respect to the interest rate on deposits.

### 2.4. Imperfect Information and Credit Rationing

Financial systems are particularly affected by imperfect information. With asymmetric information, if lenders have doubts on the credit worthiness of borrowers, they will trust more those borrowers that they know better. Depositors, on the other hand, when there is uncertainty, may only agree to finance certain risky projects when they know the bank has a stake in them.

Often, “the bank cannot distinguish among privately informed credit applicants with different risk attributes and an increase in the pooled interest rate on loans will affect safer borrowers more adversely than it does riskier borrowers. An increase in the loan interest rate therefore drives safer borrowers out of the credit market before it induces exit by others” (Bhattacharya and Thakor, 1993). This is the case of adverse selection.

Financial contracts are also affected by moral hazard. Once the contract is established, the higher the interest rate, the higher will be the incentive of the borrower to change from a safe project to a riskier one. “A rate increase skews the borrower’s project choice toward greater risk” (Bhattacharya and Thakor, 1993).

In their seminal paper, Stiglitz and Weiss (1981) deal with credit rationing as a consequence of imperfect information in the market. Credit rationing, which can be taken as the denial of credit at any price (the bank offers credit at a price at which demand exceeds supply), can spring from adverse selection, moral hazard, or both.

As referred by Hillier and Ibrahimo (1993), “under asymmetric information the interest rate may be used by lenders as a mechanism for affecting the quality of their loan portfolio rather than for clearing the loan market”. So as not to deteriorate the quality of their loan portfolio, the banks, in an environment of asymmetric
information, may prefer not to raise the interest rate to a market clearing level when there is rationing in the credit market. For those interested in deepening this area of research we would suggest the reading of Hillier and Ibrahimo (1993) survey.

Authors such as Bester (1985), Chan and Kanatas (1985), and Chan and Thakor (1987) have introduced collateral as an additional sorting device, and it was show to reduce rationing.

Monitoring is an important function of financial intermediaries. The delegated monitoring theory of intermediation was first explored by Diamond (1984). “Monitoring typically involves increasing returns to scale, which implies that it is more efficiently performed by specialized firms. Therefore, individual lenders tend to delegate the monitoring activity, instead of performing it themselves” (Freixas and Rochet, 1997). Monitoring could be interpreted in a broad sense to include screening projects (in a context of adverse selection), preventing opportunistic behaviour of the borrower during the realization of the project (moral hazard), and punishing or auditing a borrower who fails to meet contractual obligations. Authors such as Sharpe (1990), Calomiris and Kahn (1991), Diamond (1991), Rajan (1992), Besanko and Kanatas (1993), and Holmström and Tirole (1993) have also analysed the monitoring function of financial intermediaries.

Liquidity insurance is another important topic of microeconomic research in banking. Depository institutions may provide households with insurance against idiosyncratic shocks that affect their consumption needs. Banks collect the endowments of consumers (deposits) and invest a fraction of them in long-term investments while offering depositor the possibility of withdrawal on demand. This is known as fractional reserve system. One important question that arises is whether this system is stable. When there is a lack of confidence in the bank, a high number of depositors may decide to withdraw their funds for reasons other than liquidity needs. This is a source of fragility of the banking system.  

Imperfect information is a very important part of the microeconomic literature of banking and it would deserve a much longer review. However, it was not

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7 On liquidity insurance and bank runs see Bryant (1980) and Diamond and Dybvig (1983).
our intent to present here an extensive review on these issues. Thus, we have just highlighted some areas of research.

2.5. Bank Market Structure and Competition: Empirical Studies

Surveying empirical studies “designed to provide evidence on how market structure influences the performance of depositary institutions” is the purpose of a paper by Gilbert (1984). Two broad groups can be distinguished in the extensive literature produced in this area of research initiated in the 1960’s, consequence of the new legal requirements to consider the effects of bank mergers on competition. One group applies the structure-conduct-performance (SCP) framework to estimate the relation between banking structure and performance. The other group is constituted by studies of bank costs which estimate the influence of bank size and organisational form on the cost structure of banks.

The first group of studies, as mentioned before, apply the market structure-performance paradigm which was the framework available at the time from the field of industrial organisation. This methodology dominated industrial economics throughout the post-Second World War quarter century, and their developers attempted to provide a new theoretical framework to the field. However, “they rejected contemporary microeconomics as simply not up to the task of analysing real world markets” (Martin, 1993, p.8), and consequently the development of this new framework evolved around itself largely reflecting its independence with respect to the “ongoing refinements of formal models of imperfectly competitive markets” (idem). Current research in industrial economics has moved away from using the discursive and informal theoretical arguments which characterised most of the SCP literature and is now based on more formal models of oligopoly markets.

Gilbert (1984) has been highly critical on the analysis of the developments in the literature on banking structure and performance. The SCP paradigm suggests that collusion and anti-competitive practices are more likely to occur when there is a
higher degree of concentration in the market. Many studies have focused in testing this hypothesis by estimating bank performance measures as function of concentration. Concentration in local market areas appears to be the relevant measure of market structure. Furthermore, although some research has been done concerning the multimarket linkages among the major banking institutions, no conclusive result can be drawn on whether these linkages lead to anti-competitive behaviour.

In spite of its wide use, average interest rates and average service rates have proved to be inappropriate measures of performance. Bank profit measures, on the contrary, have shown not to have major measurement problems. Profit rates are likely to reflect the higher interest rate on loans, the higher the service charges on current account deposits, or the lower interest rates on deposits, which might be consequence of high market concentration in a certain area.

Some authors, considering that banks may have other objectives than the traditional maximisation of profits when operating in more highly concentrated markets, have tested these different objectives. Particularly, there was research relating to the hypothesis that banks in such an environment would be more prone to hold risky assets. This has not been, however, confirmed by the results obtained. Another hypothesis tested was one which considered the direct relationship between market power and expense preference behaviour. This latter hypothesis, although somehow evidenced in the results achieved by some researchers, has been criticised by those who argue that it is the size of the bank, and not the structure of the market, that creates the opportunities for the referred behaviour of managers. Gilbert (1984) concludes that “the evidence that banks in more highly concentrated markets pursue objectives other than profit maximisation is weak or nonexistent”.

The empirical literature surveyed by Alton Gilbert was, as it was well pointed out by Heggestad (1984), “voluminous”. Nonetheless, Gilbert admits the fact that “authors of bank market structure studies have not used such rigorous analysis in deriving the equations they estimate but have estimated relationships that are not supply equation, demand equations, or reduced forms”. By such rigorous analysis he refers to specifying “demand functions of bank customers, supply function of banks,
and derive reduced form relations between performance variables and measures of market structure”.

As mentioned above, the survey by Gilbert divided the empirical research done on this area in two groups, the second one being on the cost structure of the banking industry. This literature had changed much more in the previous twenty years than the one on bank market structure and performance, which had hardly changed. The main changes could be found in the measures of bank output, in the functional forms of the cost-output relationship, and in the methodology used in modelling “the influence of multi-office institutions on the costs even when a policy intended to restrict increases in market concentration is carried out. Outstanding in these results are their own limitations in what concerns policy issues. In fact, the mentioned studies cannot be used to assess the effect on operating cost of the establishment by the largest banks of nationwide branching systems.

Despite the number of studies in the whole area of evaluating the effect of market structure on banking performance and cost, the empirical evidence about this effect has been limited. “The economic significance of the influence of market structure on bank performance is very small (...) in even the best studies”, as stated by Gilbert. Even if there seems to be some consistency between those studies and the structure-performance hypothesis, this does not necessarily imply that higher market concentration leads to more effective collusion among banks”, he argues. We are prone to agree with this point of view.

Gilbert’s work is also concerned with regulation considerations, and with challenges to the structure-performance framework which emerged from the new developments in the theory of industrial organisation. Some studies have dealt with spatial concepts, which apparently revert the concentration-performance relationship obtained in those analysis which do not take space into consideration. Other studies, grouped in what can be called “the contestable markets literature”, claim the barriers to entry are the factor which determined performance, whilst market structure cannot be said to independently determine competition.
Authors such as De Metz have yet supported another challenge to the SCP paradigm: the differential efficiency hypothesis. This hypothesis, empirically supported by a work of Allen in 1983, argues that differential efficiency of the largest and smaller firms in various markets can explain the positive relation between profit rates and concentration. This relation would not, thus, necessarily reflect that higher concentration leads to more effective collusion. Increased profits are assumed to accrue to certain firms due to their higher efficiency rather than to any collusive activities. More efficient firms will therefore have gains in market share, leading to increased market concentration. Firms are assumed to adopt one of two strategies: maximise profits by maintaining present level of prices and firm size; or maximise profits by reducing prices and expanding firm size. The second strategy will have as consequence the increase in market concentration.

A paper by Molyneux and Forbes (1995) has empirically tested this efficiency hypothesis against the traditional SCP framework. His results for the European banking market between 1986 and 1989 show a strong support for the latter. Above in our discussion we have referred the fact that industrial organisation economics no longer relies on the SCP paradigm, but rather on more formal models of oligopoly markets, which have the “advantage of making essential assumptions precise and suggesting explicit functional forms for hypothesis testing”. Nonetheless, as further remarked by Martin (1993), “although the structure-conduct-performance school and the formal microeconomic analysis of imperfect markets developed along different paths, the paths were largely parallel”. This may explain, in a fairly simple manner, why Molyneux and Forbes’ results point to a confirmation of the SCP framework predictions. Indeed, the conclusions yield by the new industrial organisation economics “are not qualitatively different from those of the structure-conduct-performance framework”, as noted by Stephen Martin.
3. Finance, Banking and Growth

“Economists have expressed a wide variety of opinions on the effectiveness of banking systems in promoting or facilitating economic development. Schumpeter, the first modern economist to study the relationship, regarded the banking system as one of the two key agents (the other being entrepreneurship) in the whole process of development. John G. Gurley, on the other hand, has written that ‘recent experience strongly suggests that banking systems as intermediaries are not highly essential to the growth process’. It is probably safe to say that the true importance of the banking function lies somewhere between those two extremes.” (Cameron, 1972, p.5)

In the view of Cameron, although a banking system may make a positive contribution to economic growth and development, this effect may be counteracted by other factors in the economy, such as “an unfavourable resource endowment, a population that grows either too slowly or too rapidly, or inept government policies”(Cameron, 1972). In the same way, a bad banking system on the economy, may not have a substantial negative impact on growth if other factors offset this impact. In any case, it is possible to think of a banking system which may contribute more or less to the economic development of a country, depending on the different policies adopted.

Joseph Shumpeter, in 1911, believed that there were close ties between financial and economic development. He argued that the services provided by financial intermediaries were essential for technological innovation and economic development. Among the various services associated with financial intermediaries, one may refer mobilising savings, evaluating projects, managing risk, monitoring managers, and facilitating transactions.

Many are the authors who, almost ninety years after Shumpeter, in recent studies on economic growth, pay a particular attention to the links between financial systems and the pace of economic development. Worth referring is the research done

In the seventies, there were authors, such as Goldsmith (1969), McKinnon (1973) and Shaw (1973), who produced evidence that financial development correlates with growth, defending the idea that financial repression was at the heart of the poor performance of investment and growth in developing countries.

Many more were the economists, however, who accepted “Robinson’s (1952) view that finance was essentially the handmaiden to industry, responding passively to other factors that produced cross-country differences in growth” (King and Levine, 1993a). For a long period, numerous influential economists believed that finance had a relatively unimportant role in economic development. This could be interpreted as a natural consequence of the mechanics of the neoclassical growth model, where financial systems were thought to have only minor effects on the rate of investment in physical capital, and changes in investment were viewed as having only minor effects on economic growth.

In spite of the scepticism the Goldsmith-McKinnon-Shaw thesis encountered over the years, “it nevertheless had a relatively early impact through the work of the IMF and the World Bank who, perhaps in their traditional role as promoters of free market conditions, were keen to encourage financial liberalisation in developing countries” (Dixon, 1997). Low savings, credit rationing and low investment were viewed as a result of interest rate ceilings, high reserve requirements and directed credit programmes. Those in favour of liberalisation argued that allowing the real rate of interest to adjust to its equilibrium level would lead to an expansion of saving and of the total real supply of credit, thus inducing a higher level of investment.

The experiments of the IMF and the World Bank reforms in this issue were largely disappointing. In Latin America, for example, many banks collapsed. This led the advocates of financial liberalisation to introduce new elements into the
Goldsmith-McKinnon-Shaw framework. Preconditions or prerequisites such as “adequate banking supervision”, ensuring that banks diversify their loan portfolio, and “macroeconomic stability”, promoting low and stable inflation and a sustainable fiscal deficit, were suggested so as to prevent, for example, excessive risk-taking by the banks.

The channels through which interest rates affect investment and growth have been more carefully investigated. It is now accepted that higher interest rates have ambiguous effects on the total amount of saving because there are substitution and income effects working in opposite directions. “Nonetheless, it is claimed that financial savings are adversely affected by ‘financial repression’, which, in turn, influences the productivity of investment, and, through this the rate of economic growth” (Dixon, 1997).

The evidence produced in the seventies on the finance-growth nexus, although insightful, lacked analytical foundations. As stated by Marco Pagano (1993), the revival of interest in the influence of financial development on growth was the result of the theoretical advances of growth theory, namely the “insights and techniques of endogenous growth models, which have shown that there can be self-sustaining growth without exogenous technical progress and that the growth rate can be related to preferences, technology, income distribution and institutional arrangements” (Pagano, 1993). In this theoretical framework, financial intermediaries may be found to have “not only level effects, but also growth effects” (idem).

One may therefore distinguish between a traditional view and a new view both on the role of financial intermediaries and on how the economic growth process works. King and Levine (1993c) explain that traditionally financial intermediaries were viewed as organisations which passively funnelled household saving to business investment. A new view has emerged, considering that financial intermediaries have an active, perhaps dominant, role in the organisation of industry. With respect to the growth process, the traditional view is reflected in Solow’s work,
as mentioned before, which led many economists to believe that the extent to which government policies, including financial market policies, could be potential determinants of the economic growth process was limited. The new economics of growth and development, originated by the work of Romer (1986) and Lucas (1988), “suggests that a range of economic policies can have important effects on a country’s growth rate over lengthy periods. In fact, within some ‘endogenous growth’ models, policies – particularly those that influence the private costs and benefits of investing in human capital and productivity enhancement – can permanently influence the growth rate of an economy” (King and Levine, 1993c). This new line of research allowed for a different perspective on the potential influence of financial intermediaries on the level of economic development and the rate of economic growth. “Finance and financial institutions become relevant in a world of positive information, transaction and monitoring costs” (Fry, 1997).

Based on the liquidity provision model by Diamond and Dybvig (1983), Bencivenga and Smith (1991) and Greenwood and Smith (1997) present endogenous growth models where financial intermediation promotes growth by permitting a larger fraction of investment to be directed to activities with high (social) returns. The importance of financial markets for growth is well summarised by Greenwood and Smith (1997): “financial markets are the most prominent means, for instance, of channelling investment capital to its highest return uses. These markets also provide liquidity, and permit the efficient pooling of risk. Both of these activities alter the social composition of savings in a way that is (potentially) favourable to enhanced capital accumulation. Finally, financial markets foster specialization in entrepreneurship, entrepreneurial development, and the adoption of new technologies. They do this by making funds available to potential entrepreneurs for activities which – in developing countries – must typically be undertaken on a larger scale than any small number of individuals can readily afford”.

When individuals have a choice between unproductive assets (consumer goods or commodity money) and an investment in a firm, uncertainty may lead to resource misallocation by individuals. The investment in a firm takes time to become
productive, thus it is illiquid. Nonetheless, a two-period investment in a firm has a higher expected return than consumer goods or currency. “Uncertainty may force some individuals to liquidate or abandon their investments in firms after only one period. In such case, they would be worse off than had they held solely an inventory of consumer goods or currency” (Fry, 1997). When banks are introduced, this uncertainty may be avoided, given that banks are institutions which may exploit the law of large numbers, ensuring they never have to liquidate capital prematurely. Banks may also “estimate deposit withdrawals which are unpredictable individually but predictable for the economy as a whole” (Fry, 1997). According to Greenwood and Smith (1997), “intermediation is necessarily growth-enhancing”.

Other studies, not based on the Diamond Dybvig model, present different ways by which banks can stimulate endogenous growth. The role of financial intermediaries in pooling funds and acquiring information, enabling capital to be allocated to its highest value (raising the average return to capital) is stressed, for example, by Greenwood and Jovanovic (1990).

King and Levine (1993a) build an endogenous growth model, taking into consideration the Schumpeterian idea that financial institutions are important because they evaluate and finance entrepreneurs in their initiation of innovative activity and the bringing of new products to market. They conclude that better financial systems improve the probability of successful innovation and thereby accelerate economic growth. In their empirical work (King and Levine, 1993b), real per capita GDP growth is found to be strongly associated with various measures of the level of financial development (such as the ratio of liquid liabilities to GDP and the ratio of commercial bank paper to central bank credit), as well as the rate of physical capital accumulation, and improvements in the efficiency with which economies employ physical capital.

According to Maxwell Fry (1997), “the main feature of endogenous growth models is that a broadly defined concept of the economy’s capital stock does not suffer from diminishing returns; hence growth is a positive function of the investment ratio. For any endogenous growth model, growth rate comparisons can be
made between economies with and without banks”. Financial development may improve overall productivity, thus promoting growth. Financial repression, on the other hand, translated in high reserve requirements, interest and credit ceilings, directed credit programmes and inflation, actually “reduces the services provided by the financial system to savers, entrepreneurs, and producers” (King and Levine, 1993a), having a negative impact on growth.

Those in favour of financial liberalisation have found the need to put forward some prerequisites which may guarantee its success: adequate prudential regulation and supervision of commercial banks; price stability; fiscal discipline; profit-maximising, competitive behaviour by the commercial banks; a tax-system that does not impose discriminatory explicit or implicit taxes on financial intermediation (Fry, 1997).

3.1. A functional approach of financial markets and intermediaries

In order to organise an analytical framework of the finance-growth nexus, Ross Levine (1997) advocates the functional approach to understanding the role of financial systems in economic growth.

In an Arrow-Debreu state-contingent claim framework “with no information or transaction costs, there is no need for a financial system that expends resources researching projects, scrutinizing managers, or designing arrangements to ease risk management and facilitate transactions” (Levine, 1997). This is also stressed by Freixas and Rochet (1997, p.11) who say that “the Arrow-Debreu paradigm leads to a world in which banks are redundant institutions and does not account for the complexities of the banking industry”. Financial instruments, markets, and institutions emerge when we add specific market frictions to the Arrow-Debreu model, so as to mitigate the effects of information and transaction costs.
One may suggest two possible channels through which financial systems, given their financial functions, may affect economic growth: capital accumulation and technological innovation.

Following the work of Romer (1986), Lucas (1988) and Rebelo (1991), a class of growth models argue that the functions performed by the financial system affect steady-state growth by influencing the rate of capital formation. Capital accumulation is affected by the financial system either by altering the savings rate or by reallocating savings among different capital producing technologies. These models generally use either capital externalities or capital goods produced using constant returns to scale but without the use of nonreproducible factors to generate the steady-state per capita growth.

Another line of research considers the way the financial system affect steady-state growth by altering the rate of technological innovation, focusing on the invention of new production processes and goods (Romer, 1990; Grossman and Helpman, 1991; Aghion and Howitt, 1992).

Information costs and transaction costs justify the emergence of financial markets and intermediaries who, through their functions, affect saving and allocations decisions in ways that influence economic growth. One may summarise, in line with Levine (1997), the functions of financial systems in five broad categories: facilitate the trading, hedging, diversifying, and pooling of risk; allocate resources; monitor managers and exert corporate control; mobilise savings; and facilitate the exchange of goods and services. Ross Levine (1997, 2003) uses this structure to review the literature on finance and growth, also advancing potential areas of future research.

3.2. How can financial development affect growth? The ‘AK’ model
Marco Pagano (1993) presents a simple endogenous growth model to explain how financial development may affect growth. A similar model is referred by Michael Thiel (2001), in his review on finance and economic growth.

The link between finance and economic growth is very complex and may run through various transmission channels. Financial development might: reduce the loss of resources required to allocate capital (funnelling saving to firms); increase the savings ratio (affect the saving rate); improving the allocation of capital (raise capital productivity). This may be captured by a simple ‘AK’ model, where aggregate output is a linear function of the aggregate capital stock:

\[ Y_t = AK_t \]

This production function may represent two different frameworks: one is a competitive economy with external economies as in Romer (1989), where each firm faces a technology with constant returns to scale but productivity is an increasing function of the aggregate capital stock \( K_t \); alternatively, the AK model can be derived assuming that \( K_t \) is a composite of physical and human capital as in Lucas (1988), the two types of capital being reproducible with identical technologies. \( A \) symbolises capital productivity.

For simplicity, population is assumed stationary and the economy produces a single good that can be invested or consumed. Capital depreciates at rate \( \delta \), and gross investment is equal to:

\[ I_t = K_{t+1} - (1 - \delta)K_t \]

Capital market equilibrium in a closed economy with no government requires that gross saving \( S_t \) equals gross investment \( I_t \). It is assumed that a proportion \( 1 - \phi \) of the flow of saving is ‘lost’ in the process of financial intermediation. Hence,

\[ \phi S_t = I_t \]

The growth rate at time \( t+1 \) is

\[ g_{t+1} = \frac{Y_{t+1}}{Y_t} - 1 = \frac{K_{t+1}}{K_t} - 1, \]

which leads to a steady state growth rate:
\[ g = \frac{A}{Y} - \delta = A\phi s - \delta \]

where \( s \) is the gross saving rate and is given by \( s = \frac{S}{Y} \).

From the steady state growth equation we may summarise a few ways in which financial development can affect growth. An increase in \( \phi \), the proportion of saving actually funnelled to investment, may increase growth. Growth may be positively affected by and increase in the social marginal productivity of capital, \( A \). Finally, by affecting the private saving rate \( s \), financial development may affect growth.

### 3.2.i. Funnelling saving to firms

The more efficient the transformation of savings into investment, the lower the loss of resources represented by \( \phi \). There is absorption of resources by the financial sector which may represent a reward for services supplied: the fraction \( 1 - \phi \) goes to banks as the spread between lending and borrowing rates, and to securities brokers and dealers as commissions and fees. In a competitive environment, the amount of \( \phi \) is determined by the real costs of intermediation. However, \( \phi \) may be influenced by inefficiency in the provision of financial services and market power, by the redistribution of the financial intermediaries’ profits to the state by taxes (see Roubini and Sala-i-Martin, 1991, 1992) - including high reserve requirements, transaction taxes, among others -, by restrictive regulations, and by a compensation for the risk undertaken by the intermediary.

Assuming transaction costs \((1-\phi)\) to be determined by the geographic distance between the bank and the entrepreneur, Harrison et al. (1999) find a durable positive feedback between finance and growth. New banks are attracted to the financial system as a consequence of economic growth, since higher growth will raise the profit margin of financial intermediation. The entry will reduce the average distance between bank and investment projects, and consequently the costs of intermediation will be reduced. This will, in turn, increase economic growth. This
process will end when the higher wages in the banking sector discourage the entrance of new banks.

3.2.ii. Improving the allocation of capital (raise capital productivity)

As stated by Michael Thiel (2001), “the literature knows a number of channels, through which financial activity might raise the productivity of capital A. They concern (1) the selection of the most profitable investment projects, (2) the provision of liquidity, (3) the allocation of risks”.

The profitability of investment may be raised by the effective evaluation, selection and monitoring of investment projects performed by financial intermediaries. Intermediaries may channel the allocation of funds into the most profitable investment projects by collecting and analysing information (Greenwood and Jovanovic, 1990).

Without the provision of liquidity by the financial system, individual agents, facing an uncertain timing of consumption, have an incentive to invest disproportionate large amounts in short-term projects. Other investments may be more productive, but are also more illiquid. “The availability of a liquid financial market allows a larger proportion of savings to be invested in long-term projects and if an individual agent is required to bring forward consumption, he can do so by transferring assets to other agents instead of eliminating investment projects” (Thiel, 2001). The average duration of investment projects may thus be increased as a result of the provision of liquidity by the financial system. As a consequence, the productivity of the capital stock is likely to raise. This argument was initially advanced by Diamond and Dybvig (1983), and developed in endogenous growth models by authors such as Bencivenga and Smith (1991), and Greewood and Smith (1997), as mentioned previously in this paper.

With respect to the allocation of risk, one may say that the “risk-sharing role is not performed only by insurance markets but also by banks and securities markets” (Pagano, 1993). Riskier projects tend, on average, to be more profitable. Given that
financial markets might allow for risk-sharing and risk diversification, individuals may be induced to invest a higher fraction in riskier projects. This might stimulate economic growth. Portfolio diversification via the stock market may thus be related to growth, as shown by Saint-Paul (1992), in a model where financial development induces increasing specialisation and the improved division of labour raises growth. For further insights on issues of risk-sharing see Obstfeld (1994), van Wincoop (1999), Obstfeld and Rogoff (2000), Kalemli-Ozcan et al (2001) and Stulz (2000).

3.2.iii. Affecting the saving rate

The saving rate $s$ may be affected by financial development, and thus affect economic growth. However, the way financial development affects the saving rate is ambiguous, and so is the effect on growth. As financial markets develop, individuals are better insured against idiosyncratic liquidity shocks and there is a better diversification of rate-of-return risk. Consumer credit also becomes more readily and cheaply available. The wedge between the interest rate paid by firms and that received by households is also narrowed by financial development. The saving rate or saving behaviour is affected by all these factors, but this effect is ambiguous.

If individuals expect higher returns on savings, for example, instead of increasing savings, they may actually decrease because the same future consumption can be accomplished with higher present consumption and lower present savings. When individual exposure to risk is reduced by diversified portfolios, this might reduce the level of precautionary savings, or even direct savings into higher risk - higher return assets without stimulating an increase in current savings.

The financial markets and institutions also “channel funds from household that save to those that dissave, in the form of consumer credit and mortgage loans” (Pagano, 1993). Jappelli and Pagano (1994) show that liquidity constraints on households raise the saving rate, which translates into a faster growth, when there are binding liquidity constraints on households. Liberalisation of the consumer credit or mortgage market (i.e. financial development) would lead to a reduction in saving and
growth. If households borrow to finance not only current consumption but also the accumulation of human capital, De Gregorio (1996) shows that liquidity constraints will have an ambiguous effect on growth: the saving rate will be increased, but the productivity of investment \( A \) will be decreased, considering that it depends on the worker skills acquired by investment in education.

3.3. Competition in the Banking Industry and Growth

Traditionally, competition has been considered to promote efficiency. Based on the industrial organisation (IO) literature (see, e.g., Rhoades (1982), Gilbert (1984) and Freixas and Rochet (1997)), competition is often thought to minimise costs and in such a way that resources are allocated efficiently. Market power in banking would lead to higher interest on loans, lower interest on deposits, hence distorting the savings and investment decisions of consumers and producers. It is also argued that banks may operate within the limits of their technical capacity (X-inefficiency) when there is lack of competition\(^8\).

The question that some authors are recently analysing is “whether the assumptions of the standard models of competition are necessarily appropriate for the banking sector” (Allen et al, 2001), or, put differently, should the banks be treated just like any other firm or industry? With this question in mind, it might now be “unclear whether competition among banks is good or bad”\(^{(idem)}\).

Padoa-Schioppa (2001), a member of the Executive Board of the European Central Banks, notes that the views on banking competition have changed across the

\(^8\) For a survey on efficiency in banking see Berger and Mester (1997) and for a recent empirical study on these issues see Berger, Leusner and Mingo (1997).
decades, a journey from an old to a new approach, constituting “a move from a negative attitude towards a positive one with respect to banking competition”.

The financial crises of the 1930s led to a series of legislative reforms in most countries in order to preserve the stability of the banking and financial industry. It was believed that the stability of individual banks and the banking system as a whole could be guaranteed by an oligopolistic environment. The resulting oligopoly profits would allow banks to better absorb shocks, and the banking industry would have sufficient funds to rescue any institution in difficulties. “If a particular bank had severe problems, then others in the industry could be persuaded to take it over” (Allen et al, 2001). Explicit limitations of competition were considered normal or necessary until relatively recently.

Several policies were used by the authorities, in different countries, so as to limit banking competition, such as the rationing of banking licences and regulatory segmentation between financial activities (not allowing universal banking), geographic segmentation of the markets, restriction on the amounts banks could lend outside the area where they had their headquarters, limits on the establishment of new branches (which required special authorisation procedures). With respect to monetary policy, authorities used credit ceilings as a monetary control instrument, the transmission mechanism of monetary policy was largely administrative in nature, and central banks would fix exchange rates.

According to Edwards (1981), the main goal of financial regulation is “to maintain stability in financial markets and to guarantee that vicissitudes in economic activity do not undermine the economic health of nations and of the world economy”. Given that financial soundness and effective monetary control are essential dimensions of financial markets and important social goals, Edwards (1981, p.11) admits that in these markets there may be exceptions to the general proposition that “more integration of markets and greater competition are desirable ends, since both enhance economic efficiency”. “(…) competition in financial markets must be compatible with the attainment of these social goals” (idem).
Antitrust concerns in Europe only began after the Second World War, and, very often, competition policy laws did not apply to the banking industry. It was only in the 1980s that the European Court of Justice established that the Articles of the Treaty concerning competition should also apply to the banking activity. “A positive view of competition has gradually overcome the old approach” (Padoa-Schioppa, 2001).

Deregulation in the banking sector has been a common development in many countries. Actions to foster competition have, nonetheless, raised the need for strengthened prudential regulation and the coverage of deposit insurance has been extended. Prudential supervision with capital adequacy rules, deposit insurance and a set of rules for competition among banks are now, in most countries, the basis of modern banking regulation.

Moves toward increased competition in the European Union and Japan has raised a few questions: “Why have there been such different views on the desirability of different banking structures historically? What are the trade-offs between competition and concentration? What is the optimal degree of competition?” (Allen et al, 2001). The truth is that there has been a 180-degree change on the desirability of competition, and “it has been taken for granted in recent years that competition among banks should follow the broad argument that competition in industries is welfare-enhancing” (Allen et al, 2001).9

Is competition among banks good or bad? This is the question underlying a very recent debate on the economic role of market competition in the banking industry, and theoretical contributions have identified both positive and negative effects of bank competition. It is important to note that while there have been several studies of bank competition, most of the studies until recently have been typically partial-equilibrium studies that focused on specific issues in banking. The development of general equilibrium models aimed at analysing the relation between bank competition and macroeconomic performance is, in fact, relatively recent.

9 For a comprehensive study on competition and stability in banking see Canoy et al (2001).
Although the common wisdom on bank competition is that “restraining competitive forces should unequivocally produce welfare losses” (Cetorelli, 2001), “in more recent years, researchers have begun analysing additional issues in the matter of bank competition, highlighting potentially negative aspects and so raising doubts regarding the overall beneficial welfare impact of bank competition in the economy” (idem).

Some authors argue that the standard competitive paradigm is not appropriate for the banking industry. Allen and Gale (2000, Chapter 8) show that even with a large number of independent competing banks, the existence of a small fixed cost of switching banks may radically change the nature of competition, allowing for the resulting equilibrium to be the same as if there was a monopoly. Allen and Gale also show that a concentrated banking system might be more efficient than a competitive one, because the reduction in profits associated with higher competition increased the incentive for banks to take risks on their investments. This distortion in incentives is a result of their use of debt contracts with depositors. Keeley (1990), in his study on the effects of deregulation of the banking industry in the U.S. in the 1970s and 1980s, concludes there has been an increase in competition and a reduction in banks’ profits, leading to higher incentives for risk-taking. These studies seem to point to the conclusion that “a lower degree of competition can lead to higher profits and hence a larger ‘buffer’ should the financial system be hit by a shock” (Allen et al, 2001).

Todd Smith (1998), on the other hand, in a study on banking competition and macroeconomic performance, concludes that a more competitive banking system increases the level of macroeconomic activity and reduces the severity of the business cycle. Using a general equilibrium model in which financial intermediaries arise endogenously, Todd Smith attempts to show that there are macroeconomic costs of regulations designed to stabilize the banking system but that impede competition. Promoting the stability of the banking system allowing for monopoly profits by establishing barriers to entry in banking might be considered a wrong regulatory policy. He compares a situation of perfect competition in banking with another where banks are “local monopolists when the switching cost is sufficiently
high to inhibit borrowers from switching banks when the local bank charges profit-
maximizing loan rates, ignoring borrowers’ option to obtain financing from a bank at
another location”.

In a very recent paper, Guzman (2000) analyses the equilibrium growth paths
of two economies that are identical in all respects, except for the organization of their
financial systems: one with a competitive banking system and the other with a
monopolistic banking system. In his general equilibrium model of capital
accumulation, the author corroborates the idea that market power has a negative
effect on the long-run capital stock and on the rate of growth. The monopolistic bank
produces an unequivocally depressing effect on capital accumulation for two
possible reasons: when credit rationing exists, monopoly banks ration credit more
heavily than competitive banks; when credit is not rationed, the existence of
monopoly banking leads to excessive monitoring of credit financed investment
which is “socially wasteful” (Guzman, 2000). Excessive monitoring, which diverts
resources from lending, comes from the fact that with monopoly power loan rates are
higher, and with higher rates the likelihood of default also increases due to moral
hazard.

In a widely cited article, Petersen and Rajan (1995) show that in a market
where banks have monopoly power, young firms with no record of past performance
may actually receive more credit, and at better rates. When a firm is young or
distressed, there is a high potential for future cash flows from its projects, while the
actual cash it generates is low. “When the credit market is competitive and creditors
cannot hold equity claims, the lender cannot expect to share in the future surplus of
the firm” (Petersen and Rajan, 1995). In a competitive market, creditors may be
forced to charge a high interest rate while there is a high uncertainty about a firm’s
prospects. “A monopolistic creditor, on the other hand, shares in the future surplus
generated by the firm through the future rents she is able to extract. She can backload
interest payments over time, subsidizing the firm when young or distressed and
extracting rents later” (idem). The lender can thus charge lower rates initially,
attracting more young entrepreneurs. By establishing a lending relationship with
these entrepreneurs, the lender may, in the future, charge higher interest rates to those who are eventually successful. This is only feasible if the bank has market power. One may speculate, as the authors do, considering that “in the early stage of a country’s economic growth when there are comparatively few established firms, the availability of finance is most important” (Petersen and Rajan, 1995). Restricting competition among banks in this stage might be positive for the country’s economic growth.

According to Shaffer (1998), the average quality of a bank’s pool of borrowers declines as the number of competitors in the market increases. One of bank’s functions is to separate prospective entrepreneurs by quality categories. However, there may be imperfections in the screening technologies used by banks and some high quality entrepreneurs may be identified as being low quality and vice versa. If banks cannot identify rejected loan applicants, they can continue to apply to other banks. The likelihood that a low-quality applicant receives credit is higher when there are more banks in the market. A bank that decides to concede credit may be “winning” the right to fund a lemon. This is known as the “winner’s curse”.

Cao and Shi (2001), also focusing on the screening activity, show that “by exacerbating the winner’s curse, an increase in the number of banks can reduce banks’ screening probability by so much that the number of banks that actively compete in loan provisions falls and the expected loan rate rises”.

As the number of banks increases, the probability of entrepreneurs being screened may decrease. Based on the observation that entrepreneurs may be averse to being screened, Dell’Ariccia (2000) argues that, unlike in slow-growth periods, in periods of economic expansion, when there is a higher proportion of new, untested entrepreneurs, banks competing for market share may choose to do no screening when offering lending contracts. Banks are thus subject to higher risk and this may plant the seeds for a subsequent recession.

From the point of view of a bank’s lending strategy, screening and collateralising are substitutes. Once entrepreneurs post collateral on their loan, the bank may have no incentive to screen. Manove, Padilla, and Pagano (2000) compare
a competitive banking market with a monopolistic one. They suggest that a monopolistic bank would screen all projects (rather than accepting collateral), thus eliminating the allocation of resources to entrepreneurs destined to fail.

Banking market structure produces various effects on the economy, through the various functions performed by banks (such as the screening function mentioned above), given that market competition may distort banks’ incentives to perform these roles. There are authors who consider there is a trade-off between quantity and quality when analysing bank competition. “On one hand, market power may enable banks to extract rents and distort the equilibrium of the credit market away from one where the quantity of funds supplied is the highest. On the other hand, market power may be necessary to allow banks to achieve an efficient allocation of funds, thus enhancing the quality of the pool of selected entrepreneurs” (Cetorelli, 2001).

Comparing two benchmark economies, one with perfect competition and the other with a monopolistic bank, Cetorelli (1997) shows that the lending relationship problem which seems to characterise competitive credit markets can have negative repercussions for capital accumulation. Monopoly power, on the contrary, may be beneficial for growth. Cetorelli shows that while in a competitive banking market screening may not occur due to the threat of free-riding by competitor banks (lowering the average quality of the capital stock), a monopolist bank will have an incentive to perform this costly screening activity. With a monopolistic intermediary, only high quality entrepreneurs will have their contracts approved. Although a monopolist bank is able to extract rents, producing a negative effect on equilibrium quantities, market power enhances capital allocation and this effect can offset the first.

Considering that banks compete in a Cournot\textsuperscript{10} fashion, Cetorelli and Peretto (2000) show that “the market structure that maximises the economy’s steady-state income per capita is neither a monopoly nor competition, but an intermediate

\textsuperscript{10} “The Cournot model has the nice feature that competition and monopoly are the two extremes of a continuum of market structures, wherein market power is fully captured by the number of firms if the model is symmetric, or corresponding measures of market concentration if the model is asymmetric” (Cetorelli, 2001).
oligopoly”. Banks have access to a screening technology, and although the result of the screening is not directly observable, other banks may extract information on the quality of an entrepreneur simply by observing whether the bank extends or denies the loan. This leads to a free-riding problem. Cetorelli and Peretto show that the optimal strategy will be to screen entrepreneurs only with some probability. This will imply that banks will extend not only “safe” loans, but also “risky” ones. If a lower number of banks reduces the total quantity of credit available to entrepreneurs, it is also true that the incentive to screen is higher, and a larger proportion of funds will be allocated efficiently to high-quality entrepreneurs.

4. Some Evidence on European Banking

“Consolidation is taking place in Europe with a predominance of domestic mergers. (...) the dominance of domestic mergers tends to increase local concentration”

Xavier Vives, 2001

In the Euro Area, we may clearly observe the important role played by banks in the overall financial system, in the majority of the Member States. It is thus widely accepted that the euro area is a bank-based system, unlike the United States, where financial markets are predominant.

The study of comparative financial systems has been the concern of some researchers, trying to explain not only the origins of differences in financial systems across countries, but also the welfare implications of having one or another financial system. The relative importance of financial markets and intermediaries in different countries drew the attention of Allen and Gale (1995, 2000) who have compared, in terms of welfare, the two extreme cases of Germany, where intermediaries play the dominant role, and the U.S., where financial markets are dominant. In Germany, the phenomenon of concentration in the banking industry is one easily observable. A few
large banks account for most of the market share. In the U.S., on the contrary, the banking industry is much less concentrated.

It might be misleading to think, as we often do, that financial markets tend to develop in a certain sequence, such as banking lending to firms appearing first, “followed by stock and bond markets, and finally credit and insurance markets catering to households”. In fact, we end up realising that “even in countries that have reached a comparably high level of economic development” the “relative size of these markets differs significantly” (Pagano, 1993). How to define the degree of financial development of a certain country becomes, therefore, a difficult question to answer, particularly when we look at the ‘extreme’ cases of Germany and the U.S. .

In Western Europe, we may say that most of the countries are in between these two poles, combining features of the German and the U.S. models. For the majority of the countries, we may actually say that intermediaries play the dominant role, and we have a bank-based system.

It is complex to decide which of the systems is better overall. As pointed out by Allen and Gale (1995), if “markets are incomplete and incentive problems abound, (...) there is a role for intermediaries”. With complete markets, they affirm, as in an Arrow-Debreu-McKenzie world, apart from reducing transaction costs, intermediaries seem not to have a role in the economy. When moral hazard and adverse selection come into the scene, then “intermediaries must have an advantage over financial markets, since they can in principle replicate the functions of the market and in addition they have the ability to write long-term incentive contracts to reduce agency costs” (Allen and Gale, 1995). Intermediaries may provide risk sharing or intertemporal smoothing not only when markets are incomplete, but also when participation in financial markets is incomplete. In fact, “an intermediary can provide insurance against swings in asset prices by averaging gains and losses over time” (idem).

Although firms seem to have a strong preference for internal finance, this is restricted to large firms. Small firms are forced to rely in significant amounts of
external finance to cope with their need for funds, and this is considerably important when we think that potential for growth largely lies within these small firms.

It is interesting to note the view by Afonso et al (2002), who say “the trend seems to be an increase in the development of financial markets and financial innovation, even if financial intermediaries remain the main providers of funds for households and enterprises”.

There is little doubt that the European banking system has been subject to increasing competitive pressures. This has been admitted, for example, by Allen et al (2001), who consider that the “EU has committed to remove barriers across banking markets in order to have a completely integrated banking market on both the demand and supply sides”. They raise the question, however, whether competition is good or bad.

If deregulation has increased competition in European banking, we have simultaneously observed a wave of mergers in the euro area. This phenomenon of concentration, widespread across Europe, should not be disregarded. Consolidation of the industry is a fact not only in Europe but globally, and it raises the question of appropriate policy prescription. “Weekly, if not daily, we are greeted with mega-mergers the likes of which were thought inconceivable only a few years ago” (Santomero, 1999). There have been profound changes in the financial sector and “the three most obvious effects have been the increase in local market concentration, the move toward universality of institutions in the sector and the commoditization of financial services and products” (idem).

There are usually two hypotheses that are analysed in order to assess the impact of concentration\footnote{For a review on the causes, consequences and implications of the Financial Services Industry see Berger et al (1999)} on the pricing behaviour of banks: the “structure performance hypotheses”, which suggests that banks will collude and use market power to extract rents; and the “efficient structure hypothesis”, which suggests that concentration would increase the overall efficiency of the sector. If the latter
hypothesis is accepted, then we would expect concentration to be a consequence of more efficient banks growing more rapidly than less efficient ones, and we would also expect services to be priced more competitively, at least up to some point, rather than less competitively.

There is a vast literature, for the US banking market, focusing on these issues. Berger and Hannan (1989), for example, find a strong evidence in favour of the structure performance hypothesis, where the extraction of rents from customers seems to be the main motivation of banks in more concentrated markets. They build a model of bank deposit prices as a function of local concentration indices. Rhoads (1993), also find that horizontal bank mergers do not have a significant effect on the efficiency relative to other banks. Their results are against the efficient structure hypothesis, and they do not exclude the possibility that the main driving force for mergers may be, in fact, market power. “Most academic econometric studies in banking find that economies of scale are exhausted at relatively low asset levels and that the supposed cost efficiencies of mergers are hard to find or inconclusive”\(^\text{12}\) (Vives, 2001). Moreover, “the market assessment of mergers is either inconclusive or it is found that the acquirer suffers a loss of market value”(idem).

The empirical literature on the relationship between concentration, market power, and loan pricing is far more scarce when we consider the European banking industry. Jappelli (1987), for example, found that banks in the South of Italy had a significantly different pricing policy when compared with banks in the North, suggesting this reflected higher concentration of banks in Southern Italy. Differences in risk or the cost structure of banks were not found to be a sufficient justification for the pricing differences.

Bikker and Haaf (2002) found that all European banking markets could be characterised by monopolistic competition, using a measure of competition,

corresponding to the sum of the elasticities of the reduced form revenues with respect to factor prices, known as the “H statistic”.

Petersen and Rajan (1995), analysing the effect of credit market competition on lending relationships, find that banks in a more concentrated market tend to charge a lower than competitive rate in their loans to young firms, but a higher than competitive one, when the firm is old.

A recent empirical work by Corvoisier and Gropp (2002), has estimated a simple Cournot model of bank pricing. The motivation behind their study was the recent wave of mergers in the euro area, raising the question “whether the increase in concentration has offset the increase in competition in European banking through deregulation” (Corvoisier and Gropp, 2002). Using data for the period 1993-1999, they test for deviations from competitive pricing in loan markets, and define Herfindahl indices for each of the euro area countries and for a number of bank products.

The following table presents the number of banks used to calculate the Herfindahl indices by country and year.

<table>
<thead>
<tr>
<th>Country</th>
<th>Period</th>
<th>Average number of banks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>1994-1999</td>
<td>95</td>
</tr>
<tr>
<td>Belgium</td>
<td>1993-1999</td>
<td>106</td>
</tr>
<tr>
<td>Finland</td>
<td>1993-1999</td>
<td>12</td>
</tr>
<tr>
<td>France</td>
<td>1993-1999</td>
<td>442</td>
</tr>
<tr>
<td>Germany</td>
<td>1994-1999</td>
<td>2103</td>
</tr>
<tr>
<td>Ireland</td>
<td>1995-1999</td>
<td>43</td>
</tr>
<tr>
<td>Italy</td>
<td>1994-1999</td>
<td>359</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>1994-1999</td>
<td>57</td>
</tr>
<tr>
<td>Portugal</td>
<td>1994-1999</td>
<td>29</td>
</tr>
<tr>
<td>Spain</td>
<td>1991-1999</td>
<td>163</td>
</tr>
</tbody>
</table>

Source: Bankscope

Table 1.1. Number of banks used by Corvoisier and Gropp (2002) to calculate the Herfindahl indices by country and year: standardised data
The Herfindahl index of concentration is defined as the sum of squared market shares. The Herfindahl index for customer loans, for example, was calculated in the following manner:

\[
H_f = \left( \sum_{k=1}^{K} \frac{L_k}{\sum_{k=1}^{K} L_k} \right)^2 \times 1000
\]

where \( L_k \) represents consumer loans of bank \( k \) and the total number of banks in the country is represented by \( K \). The Herfindahl index varies between 1000 in case of only one bank in the country to values close to zero for a country with atomically small banks.

Corvoisier and Gropp (2002) present a table, for the period of 1991-1999, with the top five market shares and Herfindahl indices for the Euro area. Our next table focus on the years 1996-1998:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top 5 Market Share</td>
<td>38.96</td>
<td>48.25</td>
<td>50.07</td>
</tr>
<tr>
<td>Herfindahl index</td>
<td>71.50</td>
<td>80.94</td>
<td>97.88</td>
</tr>
<tr>
<td>Belgium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top 5 Market Share</td>
<td>52.20</td>
<td>53.90</td>
<td>72.50</td>
</tr>
<tr>
<td>Herfindahl index</td>
<td>98.58</td>
<td>104.50</td>
<td>114.12</td>
</tr>
<tr>
<td>Finland</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top 5 Market Share</td>
<td>71.74</td>
<td>72.72</td>
<td>73.51</td>
</tr>
<tr>
<td>Herfindahl index</td>
<td>324.94</td>
<td>336.62</td>
<td>343.23</td>
</tr>
<tr>
<td>France</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Top 5 Market Share</td>
<td>41.20</td>
<td>38.00</td>
<td>39.20</td>
</tr>
<tr>
<td>Herfindahl index</td>
<td>39.92</td>
<td>41.41</td>
<td>43.69</td>
</tr>
<tr>
<td>Germany</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top 5 Market Share</td>
<td>16.08</td>
<td>16.68</td>
<td>19.15</td>
</tr>
<tr>
<td>Herfindahl index</td>
<td>15.90</td>
<td>17.79</td>
<td>21.70</td>
</tr>
<tr>
<td>Ireland</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top 5 Market Share</td>
<td>42.2</td>
<td>40.7</td>
<td>40.1</td>
</tr>
<tr>
<td>Herfindahl index</td>
<td>149.73</td>
<td>122.60</td>
<td>107.41</td>
</tr>
<tr>
<td>Italy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top 5 Market Share</td>
<td>32.11</td>
<td>30.71</td>
<td>38.73</td>
</tr>
<tr>
<td>Herfindahl index</td>
<td>29.15</td>
<td>28.29</td>
<td>29.20</td>
</tr>
<tr>
<td>Netherlands</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top 5 Market Share</td>
<td>75.36</td>
<td>79.42</td>
<td>81.69</td>
</tr>
<tr>
<td>Herfindahl index</td>
<td>202.34</td>
<td>211.64</td>
<td>231.84</td>
</tr>
<tr>
<td>Portugal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top 5 Market Share</td>
<td>80.00</td>
<td>76.00</td>
<td>75.22</td>
</tr>
<tr>
<td>Herfindahl index</td>
<td>93.09</td>
<td>93.88</td>
<td>93.66</td>
</tr>
<tr>
<td>Spain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top 5 Market Share</td>
<td>46.00</td>
<td>45.20</td>
<td>44.60</td>
</tr>
<tr>
<td>Herfindahl index</td>
<td>38.96</td>
<td>39.92</td>
<td>42.71</td>
</tr>
</tbody>
</table>

Source: Corvoisier and Gropp (2002);
Original Sources: ECB, ECB(1999), De Bandt and Davis (1999)
Table 1.2. Euro area: Top five market shares and Herfindahl indices

One of the main conclusions of Corvoisier and Gropp (2002) is that “the increasing concentration may have lead to collusion and higher interest margins of banks for loans and demand deposits”. This may be justified by the fact that geographical proximity is important for the demand deposits market, and also because loans may be a particularly information intensive product. A bank which is familiar with the local economy may have a comparative advantage in generating the necessary information, thus being able to use this advantage so as to extract rents from borrowers. As stated by the authors, “moving from a moderately concentrated banking market (e.g. Belgium) to a highly concentrated one (e.g. The Netherlands) for loans our results suggest that increasing concentration has increased banks’ margins by 100-200 basis points, controlling for a wide variety of other factors”.

Corvoisier and Gropp (2002) have not, however, found the same results for savings and time deposits. Higher margins were not found in more concentrated markets for savings and time deposits, possibly because they may be less local in nature when compared to demand deposits or business loans.

The result that concentration in the market for demand deposits and in the market for loans lead to higher margins, and thus less favourable terms for the customers, could be interpreted as support for the structure performance hypothesis.
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