

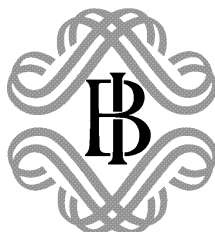
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**The Effects of Bank Consolidation and Market Entry
on Small Business Lending**

by Emilia Bonaccorsi di Patti and Giorgio Gobbi



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THE EFFECTS OF BANK CONSOLIDATION AND MARKET ENTRY ON SMALL BUSINESS LENDING

by Emilia Bonaccorsi di Patti* and Giorgio Gobbi*

Abstract

Consolidation in the banking industry of many countries has reduced the number of small banks and led to significant shifts in market shares; deregulation has fostered entry in local credit markets and branch expansion, which in turn have increased competition. Small businesses are believed to be more vulnerable to these changes since they are more dependent on credit from local banks. In this paper we investigate the consequences of consolidation and entry for these borrowers compared with those for large firms. We employ a data set for Italy, which provides information on volumes of loans and bad loans by size of borrower with a detailed geographical partition. We find that mergers are followed by a temporary reduction in outstanding credit to all sizes of borrowers and by an increase in bad loans, most likely due to the reassessment of banks portfolios. Entry has a relatively persistent negative impact on credit supply to small and medium-sized firms. Our results also show that concentration, branch density and the share of branches of small banks affect the volumes of credit and bad loans of small borrowers.

JEL classification: G21, G34.

Keywords: commercial banks, mergers, entry, small business lending.

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1. Introduction¹

According to the consensus view emerging from theoretical investigation and supported by numerous empirical studies, small businesses as opposed to large firms face specific constraints in raising external finance (Berger and Udell, 1998). Information of value to investors about small businesses is more costly to gather and most of it is not publicly verifiable. Since financial intermediaries can exploit economies in information gathering and processing, bank credit accounts for a large share of small business financing (Table 1).

Because of their special nature, small opaque firms may be adversely affected by changes in the structure of the banking industry. The issue of availability of credit to these borrowers is relevant not only from a theoretical point of view but also for policy purposes. In many countries deregulation and financial and technological innovation have stimulated extensive restructuring in the financial sector. Commercial banks have engaged in mergers and acquisitions, leading to the disappearance of many small credit institutions and the emergence of complex financial conglomerates. The lifting of barriers to geographic expansion has allowed entry in previously isolated local markets, reducing segmentation.

Structural changes can influence credit flows to small firms through three channels. First, changes that permanently modify the size distribution of banks and their geographic reach are likely to have effects on the allocation of credit across classes of borrowers with different degrees of opaqueness. Small banks tend to specialize in small business lending both because they have a limited lending capacity and because their role in local communities gives them a comparative advantage in acquiring information on borrowers. The reduction in their ranks, mainly but not exclusively due to consolidation, and the move of the industry towards a smaller number of large institutions can adversely affect the availability of credit to small, relationship intensive borrowers.

Second, a negative *direct* effect can result from changes that imply the loss of soft information or the interruption of previously established relationships, when adverse

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selection problems are severe. This loss of information could be a consequence of the restructuring that typically occurs after mergers and acquisitions (Berger, Demsetz and Strahan, 1999).

Third, changes in the number and composition of suppliers are likely to be reflected in changes in the competitiveness of credit markets. Their effect on small business lending cannot be determined unambiguously *ex ante*. On one hand, opaque borrowers have been found to benefit from stable credit relationships because market power reduces hold-up problems (Petersen and Rajan, 1994, 1995). On the other, small businesses are more vulnerable than large firms to local monopoly power because the information that they provide to their intermediaries cannot be transferred, and this increases switching costs (Hannan, 1991).

Consolidation can reduce the competitiveness of the banking industry in local markets if it increases concentration, but it can also increase industry rivalry if the advent of more efficient managers or strategy changes of some institutions induce similar behavior in other banks. By contrast, the lifting of barriers to entry is most certainly conducive to an increase in competition. According to the standard mark-up model, entry increases the availability of credit because it shifts the supply curve, leading to lower interest rates and greater quantity. On the other hand, incentives to invest in collecting information may diminish, to the detriment of opaque borrowers (Broecker, 1990; Von Thadden, 1998). Entry may therefore either increase or reduce small business lending, particularly its relationship-intensive component (Boot, 2000).

The empirical relevance of all these effects is likely to depend on the information structure of the market, including banks' ability to acquire information about the credit-worthiness of borrowers, the appropriability of that information, the heterogeneity of borrowers and their ability to signal their quality.

Advances in information technology have enormously reduced the cost of gathering and processing information. In some countries, such as the United States, the dissemination of valuable credit information about individual borrowers is rapidly expanding owing to private credit bureaus (Miller, 2000). The ability of small firms to disclose their credit histories and other relevant information through credible agencies extends the range of their possible lenders beyond local credit markets by transforming some of the previous soft information into hard information (Petersen and Rajan, 2000). But, if a significant amount of

intrinsically soft information remains, advances in information technology will not eliminate the potential adverse effects of structural changes in local credit markets for small, opaque borrowers.

In this paper we develop an empirical analysis to assess the effects of consolidation and entry in local credit markets on the availability of credit to small businesses. We examine two aspects of credit, volumes and quality, proxied by the proportion of bad loans. We apply our analysis to Italian data at the local market level because our focus is the evaluation of net effects beyond the behavior of individual institutions, e.g. consolidating banks or new entrants.

Our data set has many advantages. First, detailed information on the stock of loans in each local market by size of borrower is available whereas in other countries, including the US, such data has to be estimated. Second, data on bad loans by local market and by size of the borrower are also available. Most of the existing literature on consolidation or entry has not studied the effects on the quality of credit. Although we recognize that our measure of ex post quality is imperfect, it can provide insights into changes in the behavior of banks in screening and monitoring. Third, the level of information-sharing in credit markets in our data set is relatively high and is stable over the period examined, anticipating what may occur in countries where private and centralized credit bureaus are being set up. Since the early 1960s data on the credit records of virtually all Italian firms have been collected and provided to the banking system by the Central Credit Registry, a database managed by the Bank of Italy. This fact reduces the potential bias from omitted variables related to technological change, such as the size of geographical markets and the availability of increasing information flows within the banking system.

The remainder of the paper is as follows. Section 2 briefly reviews the relevant literature in small business finance. Section 3 discusses the empirical methodology and section 4 describes the data and the variables. Section 5 illustrates the results and section 6 concludes.

2. Previous evidence

A large number of studies has addressed the issue of how changes in the structure of the banking industry affect small business lending. The majority of these studies has focused exclusively on the effects of consolidation, without considering entry, and has been

motivated by concern that the move to a more concentrated banking industry might reduce the availability of credit to small borrowers. Fewer empirical studies have examined the impact of competition and changes in competitiveness on specific categories of borrowers.

Indirect evidence on consolidation and small business lending is offered by studies that examine the static relationship between the size and complexity of banks, and the share of small business loans held in their portfolio (Berger, Kashyap and Scalise, 1995; Levonian and Soller, 1995; Berger and Udell, 1996; Peek and Rosengren, 1996; Strahan and Weston, 1996, 1998). Their general finding is that larger banks hold less small business loans than small institutions.

One possible explanation is that small banks are limited by their financial capacity and cannot lend to larger firms, whereas large banks have access to a larger pool of potential borrowers and can supply a greater variety of products. Another argument is that small banks may enjoy a cost advantage in supplying small business loans, some of which would not be profitable for larger banks. If the first hypothesis holds, changes in bank size may or may not reduce small business lending; if the loans that large banks do not want to make are profitable for other banks, total credit to small businesses will not decrease in the aggregate. If the second hypothesis is true, on the other hand, the reduction in the number of small banks may lead to a permanent decrease in small business credit, because loans that had positive net present value for small banks are no longer profitable for larger ones.

Organizational complexity may be another determinant of the propensity of banks to provide credit to small borrowers. Theory suggests that small business lending is characterized by soft information and that monitoring and control by loan officers can be more difficult in larger and complex organizations. In addition, Williamson-type diseconomies might make joint production of transaction and relationship loans less efficient. Larger banks can employ more quantitative methods for screening rather than relying on the discretion of the loan officer.

Empirical evidence at the market level is controversial. Jayaratne and Wolken (1999) test if the relative weight of small banks in local credit markets influences the probability that a small firm has a line of credit from a bank. They find that this probability is unaffected by the number of small banks in the local market. Nonetheless, structural changes such as consolidation may cause short-run disruptions in the availability of credit to small businesses.

Berger and Udell (1996) find that larger banks tend to charge lower rates and are less likely to require collateral from small business borrowers, but they also tend to issue far fewer loans to these borrowers. Banks of greater organizational complexity, as measured by proxies of the holding company structure, generally provide less credit to small borrowers, but the effect of these variables on the lending rates charged is mixed. By contrast, Strahan and Weston (1998) find that neither the size of the bank holding company nor the complexity of its structure affects its share of lending to small businesses.

Mergers and acquisitions are likely to be associated with substantial restructuring, which is only partly related to the size and the complexity of the emerging firms. A strand of literature addresses the dynamic effects of consolidation by examining small business lending by consolidating banks before and after mergers (Keeton 1995, 1997; Peek and Rosengren, 1998; Strahan and Weston, 1998; Craig and Santos, 1997; Walraven 1997; Berger, Saunders, Scalise and Udell, 1998; Focarelli, Panetta and Salleo, 1999).

Generally speaking, the results differ by type of operation, size of institutions involved, econometric technique and number of years examined after the M&As. The most common finding is that consolidation involving large banking organizations tends to reduce small business lending. When mergers are distinguished by the relative size of acquirer and acquired bank and by their shares of small business credit, the conclusion is that acquirers tend to drive the new institution's share to converge to their pre-merger portfolio share in small business loans (Peek and Rosengren, 1998; Walraven, 1997).

Evidence for countries other than the US is scarce. A recent study of the effects of bank mergers and acquisitions in Italy (Focarelli, Panetta and Salleo, 1999) finds that banks involved in mergers and acquired banks reduce the share of credit to small businesses. The decline seems to be at least partly motivated by risk concerns since the quality of the loan portfolio tends to improve after a temporary increase in bad loans.

Similar results were found by a previous study (Sapienza, 1998), suggesting that relationship-intensive borrowers may be adversely affected by bank consolidation. The effects differ depending on whether the borrower had a relationship with the acquiring only, with the acquired only, or with both banks. The interruption of the relationships tends to be most frequent if the borrower was only a customer of the acquired bank and results in a higher cost paid for financing after the merger. Relationships that remain with the acquiring bank benefit from a decrease in rates paid.

A common finding of these studies is that restructuring of the loan portfolios is a rather common practice and small business credit is likely to be adversely affected at the bank level. The overall effect is likely to depend on the risk profile of cut off borrowers, on their informational opaqueness and on the behavior of the other suppliers in the market.

Berger, Saunders, Scalise and Udell (1998) decompose the total effect of consolidation on the share of small business lending by banks into various components. Consistently with other studies, the static aggregation of banks is associated with a reduction in small business lending; however, other banks in the same market tend to increase their small business lending. This “external effect” of M&As is empirically relevant and its magnitude may be sufficient to counteract the negative effect on small business lending directly attributable to consolidating banks.

Other studies have found that de novo banks tend to lend more to small businesses than other banks of similar size (De Young, Goldberg and White, 1999), providing an alternative source of credit to these borrowers. Berger, Bonime, Goldberg and White (1999) investigate the effects of mergers and acquisitions on de novo entry and small business lending at the local market level. Their results suggest that while M&As are associated with subsequent increases in the probability of entry into the local market where the consolidation has taken place, they do not support the view that M&As generate an increase in lending to small businesses by recent de novo entrants.

Avery and Samolyk (1999) estimate how changes in aggregate small business lending are affected by total consolidation activity. They specify a reduced form for growth rates of small business loans as a function of consolidation activity, other bank structure variables and demand variables. According to their evidence, the relationship between consolidation and small business lending growth differs across types of market. In urban markets the growth rate of small business lending by consolidating banks is lower but other institutions tend to partly compensate for the reduction. No effect is found in rural markets.

There is almost no direct evidence on the effects of entry on small business lending. Indirect evidence can be found in the literature on the relationship between competition, mainly measured by structural proxies, and the provision of credit to small, opaque borrowers. Some studies find that concentration is associated with higher interest rates on small loans, consistent with the classical mark-up model (Hannan, 1991). Others find that it is beneficial to small borrowers (Petersen and Rajan, 1995), suggesting that the relationship

is non-monotonic and varies depending on characteristics of the borrowers such as age, size, opaqueness. De Young, Goldberg and White (1998) find that concentration affects small business lending positively in urban markets (characterized by low concentration), but negatively in rural markets (which have higher concentration).

Further evidence can be inferred from the literature that investigates the relationship between bank competition and the rate of creation of firms. Jackson and Thomas (1995) find a negative effect of bank size and a positive effect of bank concentration on the rate of birth of manufacturing firms. On the opposite side, Black and Strahan (2000) find that a greater presence of large banks increases lending and is associated with a higher level of business starts, possibly because large banks can diversify more than small ones. Merger activity, by contrast, does not affect the start of businesses. Bonaccorsi di Patti and Dell’Ariccia (2001), based on Italian data, provide evidence that competition in the banking system has a negative differential effect on the rate of creation of firms in industries with increasing degrees of opaqueness but has a positive effect overall.

3. The empirical analysis

Our testing strategy consists in specifying a simple model where consolidation and entry variables affect the volume and the quality of credit at the local market level. Since we focus on potential differences between small and large firms, we estimate separately one equation for large non-financial firms and one for small and medium-sized non-financial firms. Before examining the details of the specifications, we restate the potential effects of consolidation in terms of testable hypotheses. We then outline a set of predictions about the effects of entry.

According to the *large banks hypothesis*, consolidation permanently modifies the size distribution of banks in a given local market. If large banks have a lower propensity than small banks to lend to small businesses, total credit to small businesses in that market will diminish, everything else being equal. This hypothesis does not imply any effect on bad loans.

The second hypothesis we test – the *efficiency improvement hypothesis* – follows from the view that consolidation is a way for a more efficient bank to expand by taking control of a less efficient one: the new management adopts more efficient lending policies and cuts credit to negative net present value borrowers who previously received credit, possibly

prompting emulation by its competitors. In the aggregate, consolidation activity would lead to a temporary increase in bad loans of all size groups and a temporary reduction in outstanding credit. This effect could stem from the behavior both of the consolidating banks and of other institutions in the market, because of competitive pressure not induced by changes in market structure.

We distinguish the conjecture that consolidation disrupts credit relationships into two separate testable hypotheses, in both cases assuming that the borrowers who are no longer served are positive net present value borrowers (if they are negative NPV borrowers we are under the *efficiency improvement hypothesis*).

The first case occurs when adverse selection problems are so severe that borrowers who are no longer served by merging banks cannot get credit from other banks. We would then expect a reduction in small business credit in markets where there has been significant consolidation activity. We call this hypothesis the *disruption of relations I* (with adverse selection). The reduction in lending should be limited to small and medium borrowers; it should also be temporary, because the loss of information is relevant for existing relationships but not for future ones. Hence, this hypothesis differs from the *large banks hypothesis*, which predicts a permanent modification in banks' propensity to lend to small firms in the market. There should be no effect on bad loans in the short term.

Box A: The effects of consolidation

<i>Hypothesis:</i>	Total Credit Small	Total Credit Large	Bad Loans Small	Bad Loans Large
<i>Large banks</i>	–	0 or +	0	0
<i>Efficiency improvement</i>	– temporary	– temporary	+ temporary	+ temporary
<i>Disruption of relations I (adverse selection)</i>	– temporary	0 or +	0	0
<i>Disruption of relations II (no adverse selection)</i>	0	0	0	0

In the second case, adverse selection problems are marginal at most and borrowers dropped by consolidating banks are able to find credit from other banks. There should be no effect at the market level on credit and bad loans. We call this conjecture the *disruption of*

relations II hypothesis (without adverse selection). The predicted signs of the effects indicated by each of the hypotheses described are summarized in Box A.

The theoretical literature yields opposite predictions on the effects of entry on the volume of credit. A positive effect is indicated by the *standard mark-up channel*; a negative one by several information-based models. The estimated coefficient of *Entry* is the net of these effects.

We suggest two potential interpretations for a negative coefficient of *Entry*. The first posits that competition increases as a consequence of entry of new participants in the market, worsening hold-up problems, moral hazard and adverse selection, thereby reducing the incentive for banks to lend to opaque borrowers (*information asymmetries hypothesis*). The empirical prediction in this case is a negative sign for small business lending but not for credit to large firms. Nothing can really be said about bad loans without making additional assumptions on the degree of risk of the pool of small versus large borrowers.

The second interpretation is that entry causes an increase in competition not only in the loans market but also in the deposit market, thereby shrinking interest margins. Banks facing higher deposit interest rates tend to curtail lending to lower quality borrowers. This hypothesis has been studied in the context of the effects of a monetary policy restriction (Asea and Blomberg, 1998; Lang and Nakamura, 1995) and we will refer to it as the *flight to quality hypothesis*. Entry would determine a reallocation of credit away from marginal borrowers in all size classes. No direct effect on bad loans can be predicted in the short run but a reduction in the medium term is likely. The hypotheses tested about entry are summarized in Box B.

Box B: The effects of entry

<i>Hypothesis:</i>	Total Credit Small	Total Credit Large	Bad Loans Small	Bad loans Large
<i>Mark-up</i>	+	+	0	0
<i>Information asymmetries</i>	–	0 or +	?	?
<i>Flight to quality</i>	–	–	– *	– *

*In the medium run.

We specify a simple model where the volume of credit in local market i at time t is a function of consolidation, entry and a set of controls as follows:

$$\ln(y_k)_{it} = \mathbf{a} + \mathbf{b}_1(L)Sh_merged_i + \mathbf{b}_2(L)Sh_acquired_i + \mathbf{b}_3(L)Entry_i + \mathbf{B}_1Controls_i + \mathbf{B}_2x_i + \mathbf{B}_3z_t + e_{it} \quad (1)$$

where x_i and z_t are market and time dummy variables. The subscript k for the dependent variable indicates that the regression is estimated separately for $k = large\ non-financial\ firms, small\ and\ medium-sized\ non\ financial\ firms$. We define local markets as provinces and employ yearly data.

Consolidation activity is measured by the share of credit in the local market that has been involved in a consolidation. We construct separate variables for mergers (Sh_merged) and acquisitions ($Sh_acquired$) according to the definitions discussed in the next section. The variable $Entry$ is computed as the proportion of branches at time t that belongs to banks that were not present in the local market i at time $t-1$. The three variables enter the regression with a lag structure in order to capture time patterns that contribute to discriminate among different hypotheses.

The set of control variables includes measures of economic activity and subsidized credit. Local economic conditions are captured by the natural log of GDP in each province. Subsidized credit is included because several government schemes for subsidized lending were phased out during the sample period, potentially affecting small borrowers in a different way than large ones (Gobbi, 1996).

Since the structure of the local banking system may change for reasons other than consolidation and entry, as a robustness check we estimate the effect of consolidation on credit including bank structure variables such as the level of concentration in local markets, the geographic expansion of banks within the market captured by branch density, and the relative weight of small banks.

This specification allows us to separate the *direct* effects of consolidation and entry from those induced through changes in concentration, the presence of small banks and branch density. This second equation is of the form:

$$\ln(y_k)_{it} = \mathbf{a} + \mathbf{g}_1(L)Sh_merged_i + \mathbf{g}_2(L)Sh_acquired_i + \mathbf{g}_3(L)Entry_i + \mathbf{g}_4Concentration_{it-1} + \mathbf{g}_5Branch\ Density_{it-1} + \mathbf{g}_6Small\ Banks_{it-1} + \mathbf{G}_7Controls_{it} + \mathbf{G}_8\mathbf{x}_i + \mathbf{G}_9\mathbf{z}_t + v_{it}. \quad (2)$$

The specification is, again, estimated separately for credit to large and to small and medium-sized non-financial firms. To determine whether changes in bank structure affect the quality of credit we specify the log-odds ratio of bad loans to total loans as a function of the same regressors included in equation (1). The dependent variable is defined as $\ln[(bad\ loans_k/total\ loans_k)/(1-(bad\ loans_k/total\ loans_k))]$, which is a formulation of the bad loans ratio. Symmetrically, we estimate the log-odds model with the same set of explanatory variables included in equation (2). The specification described by equation (2) not only provides a means to control for changes in credit or loan quality not induced by consolidation and entry, but also a way to focus on the hypotheses about the disruption of relations, thereby improving identification.

Specifically, the effect of the *large banks hypothesis* is removed when we include the share of small banks directly in the regression because the coefficient of the consolidation variables is conditioned on the size distribution of banks. Also the effect of mergers on competition caused by changes in market shares is absorbed by the concentration variables. The coefficient of the merger variables would capture strategy changes of market participants and any effect on competition not produced by concentration. What remains in the estimated coefficients is the net effect of the *efficiency improvement hypothesis* and of the *disruption of relationships I and II* hypotheses.

Similarly, the effect of entry that remains once we control for the number of branches and for concentration is the composition effect due to the presence of outside competitors, which is more closely related to asymmetric information issues because outsiders do not have specific knowledge of the local market.

It is crucial to underline that we are only able to assess market level effects and we are not attempting to draw any conclusion about the behavior of individual banks, which has been extensively analyzed by other studies. In addition, we are identifying mainly first order effects, particularly on the quality of loans. Consolidation can lead to different risk-taking in the merging banks, because size allows more diversification within each size class. If this effect is large enough, it may show up as an increase in the bad loans ratio of each size class of borrowers, although most likely not immediately after the merger.

4. Data and variables

Our data refer to lending in local credit markets, defined as provinces, during the period 1990-98. Aggregate volumes of loans and bad loans² are constructed from the Italian Central Credit Register (CCR), a public credit reporting system managed by the Bank of Italy that collects from banks information on individual borrowers with bank debt of at least ITL 150 million.³ The CCR releases aggregate credit statistics by sector, location and size of borrowers. These statistics include information on outstanding credit and bad loans. Bad loans are defined on a customer basis and therefore include all the outstanding credit to borrowers considered insolvent.

We define as small and medium-sized firms those with total bank debt of between ITL 250 million (around USD 130,000) and ITL 5 billion (USD 2,6 million).⁴ Firms include non-financial corporations, individual enterprises and sole proprietorships.

A potential bias in the data could be generated by the exclusion of a large number of micro enterprises. Using the information available from banks' supervisory reports we have estimated that about 70 per cent of total credit to firms with less than ITL 5 billion of bank debt is included in our data.⁵

² According to the Italian supervisory guidelines a loan is classified as a "bad loan" if the borrower is facing serious economic and financial problems that may threaten his ability to meet his obligations (repay principal, interests or both) or if legal proceedings have been initiated. The assessment of the borrower's ability to repay has to be made independently of loan guarantees and collateral.

³ Before 1995 the reporting threshold was ITL 80 billion. Since 1997 non-bank financial institutions (e.g. leasing, factoring and consumer credit companies) also report to the CCR. A brief comparative description of the Italian CCR is contained in Miller (2000).

⁴ Data in the lowest class (borrowers with outstanding bank debt of between ITL 150 and 250 million) are rather noisy and may introduce a bias because of multiple lending relationships even among relatively small firms (Detragiache, Garella and Guiso, 2000). Since each bank reports only borrowers to whom it has lent more than ITL 150 million, after a merger many previously unreported customers may appear in the CCR statistics if the sum of their previous loans surpasses the threshold.

⁵ The majority of the firms excluded belongs to agriculture and retail trade. As a robustness check we have employed supervisory report data on outstanding credit to sole proprietorships. These data do not distinguish by size of borrower but have the advantage of no lower bound for reporting. Consistent information on credit to sole proprietorships with a breakdown by local markets is available only since 1995. Estimates for this period employing sole proprietorship data are consistent with the results obtained with the CCR data for small and medium-sized firms.

We define local markets as the 95 provinces.⁶ Provinces are the finest geographical partition for which a rich set of economic statistics exists. On average, about 80 per cent of credit to small and medium-sized businesses, under our definition, is granted by bank branches operating in the same province.

We construct our consolidation variables as the share of the loan market that has been shifted in market i at time t by consolidation activity. We classify the operations of consolidation in two types: “mergers” and “acquisitions”. The class “mergers” comprises (i) actual mergers, where two or more banks form a new entity, and (ii) acquisitions of a bank by another, followed by a merger (the acquired bank disappears). The class “acquisitions” comprises (iii) acquisitions where a bank acquires control over another bank, and (iv) the creation of a banking group from existing banks or existing bank holding companies. Our classification is motivated by the intuition that in the first two cases the degree of integration is more extensive than in (iii) and (iv), usually implying a reorganization within the new bank created. Plans to shift the business focus of the bank towards financial services, as in the case of mergers, are likely to be associated with changes in credit standards and a reduction in lending activity.

The notion of control in (iii) is that adopted by the Bank of Italy’s Banking Supervision Department and implies the power to influence the business strategies of the entity rather than the ownership of a given shareholding. In the 1990s there were almost 300 mergers and more than 100 acquisitions where the acquired bank continued to operate as a separate legal entity (Table 3).

In calculating market shares shifted by consolidation activity, our treatment of both types depends on whether the consolidation originates a new institution and whether a leader and a target can be unambiguously identified.

The *Sh_merged* variable is constructed as follows. In the case of actual mergers “between equals” (i) we compute the share summing those of the banks involved. In the case of an acquisition followed by a merger (ii) we only count the share of the target (or passive) bank.

⁶ We use the partition into 95 provinces. The 8 additional provinces that were created in 1995 have been aggregated backwards, according to the old boundaries.

The *Sh_acquired* variable is calculated by a similar reasoning: in the case of standard acquisitions of control (iii) we only consider the market share of the acquired (passive) bank. Finally, when existing banks or holding companies form a banking group or another holding company (iv) we count the share of all entities involved if a leader cannot be identified; otherwise we count only the share of the target. The rationale of this criterion is to isolate the share of the credit market that will most likely undergo a change in lending strategies after the deal; the effects induced by changes in competition are captured indirectly through changes in concentration.

We construct the variable *Entry* as the share of branches in each province held by banks that were not present in that province in the previous year. The share is adjusted for the effect of mergers and acquisitions.

The variables that describe the structure of the banking system in the provinces are calculated as follows. Concentration is measured by the Herfindahl Index of loans, based on the residence of the borrower (*Herfindahl*). The variable *Branch_density* is the ratio of the number of branches to population, multiplied by 10,000.

The presence of small banks (*Sh_smallbanks*) in the local banking market is measured by the share of their branches. Small banks are defined according to the official classification currently used by the Bank of Italy.⁷ Average total assets for these institutions were about ITL 700 billion in 1995 (Table 2).

The share of subsidized credit (*Sh_subscredit*) is computed as total credit issued under some central or local government subsidy scheme divided by total credit (see Gobbi, 1996 for a description of subsidies). The level of economic activity is measured by the natural log of nominal value added (*lnGDP*). The data on value added at the province level are released by the Union of the Italian Chambers of Commerce and are available up to 1997. Figures for 1998 have been estimated using data on employment growth.

Tables 2 and 3 report some statistical information on the Italian banking system and its evolution in the last decade. In table 2 the breakdown of outstanding credit by size of borrower and size of bank is shown. Between 1989 and 1998 the share of total bank lending

⁷ A bank is classified as small if its gross total assets are less than ITL 5,500 billion (around USD 2.8 billion). In 1995 there were 987 banks in Italy, 926 of which were classified as small. Among the latter 827 institutions were defined as minor, with gross total assets of less than ITL 1,500 billion (around USD 780 million).

to small and medium-sized firms declined by about 3.5 percentage points. Table 3 reports the number of mergers and acquisitions, classified by the size of target banks. Small banks represented the vast majority of target banks in both types of operations. The second section of Table 3 shows the distribution of local markets by the share of credit involved in consolidation, based on our methodology.

The quantity and log-odds equations have been estimated employing data referring to two periods: the full period available (1990-98), and a shorter period (1995-98), to exclude the effects of the 1992-93 recession, which probably cannot be captured by the time dummies because of a significant differential impact across sectors and provinces. A large number of firms failed, potentially reducing the pool of borrowers, again in a uneven way across provinces. Descriptive statistics are reported for both periods in table 4.

5. Results

Tables 5-A and 5-B report the results of the estimation of equation (1) on 1990-98 and 1995-98, respectively, based on the within panel estimator obtained estimating on deviations from means.⁸ The log-odds model has been estimated instead with weighted least squares to improve efficiency (see Greene, 1993). Dummy variables for each local market have been included directly in the set of regressors. The weights are computed as $(BLi*PLi)/(BLi+PLi)$ where BLi is the value of bad loans and PLi is the value of performing loans in market i , as in standard estimation of proportion data. The variables of structural change (Sh_merged , $Sh_acquired$ and $Entry$) enter the regression with three lags. This lag structure has been motivated by previous evidence on the time span of the adjustment period that follows M&As and entry (Berger, Saunders, Scalise and Udell, 1998; Berger, Bonime, Goldberg and White, 1999).

The overall pattern of coefficients is consistent across the two periods, although the lag structure is estimated more precisely in 1995-98 because consolidation activity and entry were more extensive after 1993, generating more cross-sectional variation in the data especially for acquisitions. We will briefly discuss only the result for this period (Table 5-B).

⁸ We report results for the within estimator. We have also performed FGLS to account for potential autocorrelation in residuals. Comparison of results shows that the fixed effects remove most of the autocorrelation, hence the LSDV model is well specified without the need to include the lagged dependent variable.

A first finding is that mergers have an opposite effect on the volume of credit with respect to acquisitions. The effect of *Sh_merged* is negative and tends to vanish over time, whereas that of *Sh_acquired* is positive and persistent. More importantly, these results hold for both large firms and small and medium-sized firms, and are robust to the inclusion of the variables describing the structure of local banking system (concentration, branch density and presence of small banks). The effect of *Entry* on the volume of credit is negative for both categories of firms, but it is statistically significant and quite persistent only for small and medium-sized ones.

Tables 6-A and 6-B show the results of the log-odds ratio estimates for the periods 1990-98 and 1995-98 respectively. Again, the coefficient estimates for consolidation and entry are stable over the two periods, so we will briefly comment on the shorter period (Table 6-B).

Merger activity (*Sh_merged*) has a positive and statistically significant effect on the probability of one currency unit falling in the category of bad loans. This effect is true whatever the size class of the borrower. Acquisition activity tends to reduce this probability. The effect of entry is negative but not statistically significant with the exception of the specification for small and medium-sized firms with the controls for market structure (column 4, Table 6-B). This result is likely to be a consequence of the interaction between entry and concentration which may generate strong multicollinearity.

A comparative reading of the estimates of the effects of consolidation on credit flows and on the share of bad loans (Tables 5-A and 5-B, 6-A and 6-B) is possible referring to the hypotheses previously described in Box A. As merger activity has different effects from acquisition activity, we discuss them separately. The *large banks hypothesis* appears to be inconsistent with our findings for two reasons. First, we find a *temporary* negative impact of mergers on *both* large and small borrowers; second, we observe an increase in the share of bad loans not predicted by this hypothesis.

The predictions of the *disruption of relations II hypothesis* are also not consistent with the pattern of our estimated coefficients, as we do observe a reduction in credit volumes. The *disruption of relations I hypothesis* is consistent with the temporary negative effect on small business lending but not with the effect on loans to large firms. The signs of the effect on bad loans would appear inconsistent with this hypothesis as well. Finally, our results seem to

match more closely the predictions of the *efficiency improvement hypothesis* not only for the signs of the derivatives but also for their time patterns.

The effect of acquisitions does not fit with any of the above hypotheses, because acquisition activity is followed by an increase in credit to borrowers of all sizes. One possible explanation is that acquisitions do not necessarily imply, at least in the short run, a loss of information as long as local management stays in office. In addition, if the acquiring bank is large, the acquired may benefit from economies of organization, diversification and funding, with a consequent expansion in lending. At the local market level we may observe an increase in credit supply to all borrowers. In the case of Italy, there is evidence that acquirers are significantly larger than acquired banks, whereas in the case of mergers the size difference is smaller (Focarelli, Panetta and Salleo, 1999). The reduction in the log-odds ratio may be explained both by write-offs and by an improvement in the quality of new loans.

The negative impact of *Entry* on credit appears to be inconsistent with the standard mark-up model in which entry increases competition in a given market, resulting in lower interest rates and a greater supply of credit to all borrowers. It is not fully consistent even with information-based models because the negative sign also appears in the regression for large borrowers. Consistently with our interpretation of the effects of consolidation, the results may be explained by the *flight to quality hypothesis* discussed in the literature because we observe a reduction both for large and small firms and a tendency towards a reduction in bad loans after the second period. However, it is difficult to disentangle potentially coexisting effects.

The estimates reported provide some insights into the effect of the structure of the banking system on the volume and quality of credit. In particular, we find that concentration has a positive and significant coefficient in the equation for credit to small and medium-sized firms whereas it has a negative and significant coefficient in the case of large ones (Table 5-A). Branch density has a positive significant effect on credit to small firms, consistent with the intuition that the geographic expansion of banks is beneficial to local borrowers.

The share of branches of small banks has a positive effect on credit to both size classes of firms for a relatively low value; the effect becomes negative as the share of small banks increases. The derivative at the sample mean is positive for both classes of firms, consistent with the view that small banks engage relatively more in traditional lending than

large banks but that banking markets characterized by a disproportionate number of very small banks reflect underdeveloped financial systems.

Results in Table 6-A show that the structure of the local banking system has a strong effect on the probability of one monetary unit of credit falling in the category of bad loans. The share of subsidized credit has a highly significant positive coefficient, corroborating the intuition that government credit facilities can create moral hazard and distortions in fund allocation. Branch density has a negative coefficient, which may suggest that the closeness of banks to firms improves their screening and monitoring ability. The share of small banks has a non-monotonic effect on the quality of credit; at the sample mean the coefficients for both large and small firms are negative.

The Herfindahl index has a positive and significant coefficient, showing that higher concentration is associated with poorer loan quality for all categories of borrowers. In the case of small and medium-sized firms this result, combined with the finding that concentration increases the volume of credit, is consistent with lower efficiency of banks in concentrated markets (Table 6-B).

As a final check of the stability of the relationship between bank structure and credit volumes, we have removed the consolidation and entry variables. As shown in table 7, the results are consistent with those of table 5-A and 5-B. The effect of concentration is positive for small and medium-sized firms and negative for large ones. By contrast, branch density has a positive effect on credit availability for all firms. Concentration is associated with a higher incidence of bad loans, measures of bank development are associated with a lower one.

6. Conclusion

We have investigated the effects of structural change in the banking industry on the availability of credit to small businesses, considering two sources of structural change: consolidation and entry. We find that consolidation and entry influence the volume of credit to both large firms and small and medium-sized ones. Specifically, mergers are followed by a temporary reduction in credit and by an increase in the share of bad loans, which is consistent with the view that they lead to efficiency improvements in lending policies and a cut in credit to negative present value borrowers. However, based on our findings, we cannot exclude some temporary disruption of relationships at the expense of non-negative net

present value small borrowers. We do not find support for the hypothesis of a permanent reduction in credit to small firms due to changes in bank size.

Our results show that entry has a negative impact on lending to all size categories, significant for small ones, and no effect on bad loans. While this effect seems inconsistent with the standard model of competition in which a larger number of suppliers in a market yields lower interest rates and more credit, it may be explained by a “flight to quality” effect driven by increased competition in lending and deposit markets. Finally, the estimates suggest that the structure of local banking markets affects the quantity and quality of credit in important ways. Concentration is associated with a larger volume of credit to small borrowers, but also with a lower quality of the loan portfolio for all size categories. Branch density has positive effect on credit flows. The share of small banks has a non-monotonic effect on the quality of credit, possibly indicating that bank size is capturing other factors such as the degree of development of the financial system.

Table 1**Size and debt composition of firms in selected countries**

Data on the share of employment by firm size are from European Commission (1998). Small and medium-sized enterprises are those with less than 250 employees. For the European countries figures are of 1995, for Canada 1994, for the US and Japan 1993. Data on firms' debt composition are computed for a sample of firms contained in the European Commission Bank for the Accounts of Companies Harmonized (BACH). Data refer to 1998 for Belgium, France and Italy, to 1997 for the other European countries, and to 1995 for the US and Japan. Small and medium-sized firms are those with annual turnover below ECU 40 million. For the US, "Small and medium-sized firms" refers to firms with turnover up to ECU 7 million and "Large firms" refers to firms with turnover between ECU 7 million and ECU 40 million.

	Share of employment accounted by small and medium-sized enterprises				Bank debt as a Percentage of total debt	
	Industry and energy	Cons- truction	Trade, hotels, restaurants	All sectors	Small and medium- sized firms	Large firms
Belgium	55.9	93.7	90.4	72.6	46.5	50.1
France	51.2	84.9	81.3	65.9	48,8	21.3
Germany	37.6	87.1	73.3	57.7	57.4	29.9
Italy	74.1	95.2	94.8	79.9	66.4	27.3
Netherlands	49.9	70.9	77.9	60.6	54.9	35.9
Spain	70.2	90.9	89.1	79.4	66.5	50.4
UK	47.9	88.2	58.1	56.9	n.a.	n.a.
US	37.5	88.9	58.5	52.9	40.9	7.9

Table 2**Banks by size and composition of loans**

Banks are grouped according to the Bank of Italy's classification introduced in 1995. In this paper we have collapsed the official "major banks" and "large banks" classes into a single group referred to as "large banks". In the same way we consider "small banks" and "minor banks" jointly as "small banks". All data are end-of-year values. Banks chartered but with no assets at the reporting date are excluded. Special credit divisions have been consolidated into the parent bank. Data on branches and total assets come from the supervisory reports. Data on loans come from the aggregate statistics of the Central Credit Register and refer to total outstanding loans (inclusive of bad loans) to customers whose total bank debt is greater than ITL 250 million. Medium-sized firms are defined as all the non-financial enterprises with bank debt between ITL 1 million and ITL 5 billion. Small firms are defined as non-financial firms with bank debt between ITL 0.25 billion to ITL 1 billion.

	1989	1992	1995	1998
Large banks:				
Number	26	25	24	24
Branches	6,426	91,32	11,464	12,566
Average total assets (billions of lire)	35,095	49,995	63,684	72,730
National loan market share	57.0	58.4	59.8	59.2
Loan composition:				
<i>Large non-financial firms</i>	42.9	42.9	43.2	41.6
<i>Small and medium-sized non-financial firms</i>	26.5	24.1	25.9	23.1
<i>Other borrowers</i>	30.7	33.0	31.5	35.3
Medium-sized banks:				
Number	40	39	36	32
Branches	2,742	3,356	3,964	4,484
Average total assets (trillions of lire)	7,408	10,533	13,963	16,564
National loan market share	21.1	20.7	21.6	19.8
Loan composition:				
<i>Large non- financial firms</i>	42.4	44.9	44.8	47.9
<i>Small and medium-sized non-financial firms</i>	32.6	30.1	30.4	28.7
<i>Other borrowers</i>	25.0	25.1	24.8	23.4
Small banks:				
Number	1,057	1,000	912	862
Branches	6,401	7,523	8,210	9,577
Average total assets (trillions of lire)	408	562	718	979
National loan market share	21.9	20.9	18.6	20.9
Loan composition:				
<i>Large non-financial firms</i>	31.2	32.9	32.1	34.5
<i>Small and medium-sized non- financial firms</i>	45.5	43.9	46.9	43.5
<i>Other borrowers</i>	23.2	23.2	21.0	22.0
Total banks				
Number	1,176	1,073	970	921
Branches	15,569	20,011	23,638	26,627
Average total assets (trillions of lire)	1,462	2,086	2,802	3,365
Loan composition:				
<i>Large non-financial firms</i>	40.6	41.6	41.7	41.8
<i>Small and medium-sized non-financial firms</i>	31.3	28.8	29.7	27.6
<i>Other borrowers</i>	28.1	29.6	28.5	30.5

Sources: Italian Central Credit Register and Bank Supervisory Reports.

Table 3**Banks by size and distribution of local markets by number of M&As**

Banks are grouped according to the Bank of Italy's classifications introduced in 1995. If the acquired bank loses its charter and the acquiring bank maintains it, we count only the target bank; in the case of a merger that originates a new institution we count all the banks involved. These cases are all included in the category "Mergers". Within the category "Acquisitions" the creation of bank groups are treated in the same way: whenever there is a clear leader we consider only the target banks, otherwise all the institutions involved are included. Provincial market shares are expressed in percentage points. The number of provinces indicates the number of cases in which the market share shifted by mergers and acquisitions falls in the percentage class specified.

	1990-92		1993-95		1996-98	
	<i>Mergers</i>	<i>Acquisitions</i>	<i>Mergers</i>	<i>Acquisitions</i>	<i>Mergers</i>	<i>Acquisitions</i>
Number of Banks						
Size group:						
Small banks	123	9	150	14	80	62
Other banks	5	0	10	10	2	11
Total banks	128	9	160	24	82	73
	<i>Mergers</i>	<i>Acquisitions</i>	<i>Mergers</i>	<i>Acquisitions</i>	<i>Mergers</i>	<i>Acquisitions</i>
Number of provinces						
Percentage of loans shifted by M&As:						
From 0 to 1	46	34	38	40	49	30
From 1 to 2	16	2	16	12	9	11
From 2 to 5	16	2	20	18	9	23
5 and more	16	2	16	24	6	29

Sources: Italian Central Credit Register and Bank Supervisory Reports.

Table 4**Descriptive statistics**

The statistics reported for the explanatory variables with the exception of $\ln(\text{Value Added})$ are calculated for end-of-previous-year values, as employed in the estimation.

	Mean		St. Dev.		Minimum		Maximum	
	1995-98	1990-98	1995-98	1990-98	1995-98	1990-98	1995-98	1990-98
Dependent Variables								
<i>Ln(loans)</i>	14.423	14.237	1.227	1.250	10.237	10.058	18.242	18.242
Large Firms								
<i>Ln(loans)</i> Small & Medium-sized Firms	14.530	14.406	0.882	0.882	12.367	12.001	17.252	17.252
<i>Ln(Odds ratio)</i>	-2.503	-3.007	2.445	2.948	-22.659	-23.391	0.449	0.449
Large Firms								
<i>Ln(Odds ratio)</i> Small & Medium-sized Firms	-1.659	-1.933	0.796	0.737	-3.566	-4.078	0.053	0.053
Explanatory Variables								
Sh_merged	0.026	0.026	0.045	0.045	0	0	0.361	0.361
Sh_acquired	0.032	0.021	0.059	0.049	0	0	0.431	0.431
Entry	0.014	0.014	0.040	0.029	0	0	0.407	0.407
Herfindahl	0.092	0.092	0.041	0.044	0.035	0.028	0.244	0.269
Branch_density	4.421	3.954	1.589	1.750	1.459	0.398	9.702	17.189
Sh_smallbanks	0.398	0.422	0.201	0.210	0.040	0.040	0.948	0.959
LnGDP	16.336	16.195	0.790	0.792	14.342	14.200	19091	19.091
Sh_subscrit	0.110	0.115	0.066	0.061	0.013	0.013	0.380	0.380

Sources: Italian Central Credit Register and Bank Supervisory Reports. GDP and population data are provided by the Union of the Italian Chambers of Commerce.

Table 5-A

Structural change and market loans by type of borrower (1990-98)

The dependent variable is defined as $\ln(loans_i)$, where i indicates each type of borrower and is equal to: large non-financial firms, small and medium-sized non-financial firms. The number of observations employed in the estimation is 855; province fixed effects and year dummy variables are included in each regression (coefficients for these variables are not shown). Standard errors are reported below coefficients.

Credit to:	Large Firms	Large Firms	Small and Medium-sized Firms	Small and Medium-sized Firms
Constant	15.379 ***	14.434 ***	14.796 ***	14.104 ***
	<i>0.679</i>	<i>0.790</i>	<i>0.247</i>	<i>0.280</i>
Sh_merged_1	-0.234	-0.235	-0.197 ***	-0.189 ***
	<i>0.163</i>	<i>0.163</i>	<i>0.059</i>	<i>0.058</i>
Sh_merged_2	-0.060	-0.069	-0.026	-0.050
	<i>0.177</i>	<i>0.179</i>	<i>0.064</i>	<i>0.063</i>
Sh_merged_3	0.142	0.133	0.063	-0.029
	<i>0.177</i>	<i>0.179</i>	<i>0.064</i>	<i>0.063</i>
Sh_acquired_1	0.204	0.188	0.141 **	0.114 **
	<i>0.154</i>	<i>0.154</i>	<i>0.056</i>	<i>0.054</i>
Sh_acquired_2	0.167	0.178	0.102 *	0.091
	<i>0.162</i>	<i>0.162</i>	<i>0.059</i>	<i>0.057</i>
Sh_acquired_3	0.355 **	0.362 **	0.060	0.036
	<i>0.167</i>	<i>0.169</i>	<i>0.061</i>	<i>0.060</i>
Entry_1	-0.435 *	-0.426 *	-0.569 ***	-0.557 ***
	<i>0.243</i>	<i>0.241</i>	<i>0.088</i>	<i>0.086</i>
Entry_2	-0.190	-0.239	-0.240	-0.272 *
	<i>0.418</i>	<i>0.416</i>	<i>0.151</i>	<i>0.148</i>
Entry_3	1.110 ***	1.052 **	-0.294 *	-0.335 **
	<i>0.411</i>	<i>0.408</i>	<i>0.149</i>	<i>0.145</i>
Herfindahl_1	-	-1.283 **	-	0.636 ***
	-	<i>0.550</i>	-	<i>0.195</i>
Branch_density_1	-	0.014 *	-	0.011 ***
	-	<i>0.008</i>	-	<i>0.003</i>
Sh_smallbanks_1	-	0.970 **	-	0.674 ***
	-	<i>0.446</i>	-	<i>0.158</i>
Sh_smallbanks squared_1	-	-1.023 **	-	-0.749 ***
	-	<i>0.438</i>	-	<i>0.155</i>
LnGDP	-0.055	-0.005	-0.011	0.015
	<i>0.041</i>	<i>0.046</i>	<i>0.015</i>	<i>0.016</i>
Sh_subscredit_1	0.291	0.125	0.375 ***	-0.177
	<i>0.310</i>	<i>0.330</i>	<i>0.112</i>	<i>0.117</i>
<i>R-squared (within)</i>	<i>0.602</i>	<i>0.611</i>	<i>0.844</i>	<i>0.853</i>
<i>F(23[19],737[741])</i>	<i>59.20</i>	<i>50.33</i>	<i>211.23</i>	<i>187.27</i>
<i>F(94,737[741]) that all ui=0</i>	<i>61.54</i>	<i>51.10</i>	<i>155.57</i>	<i>126.07</i>

Note: Statistically different from zero, respectively, at: *** 99 percent, **95 percent and *90 percent significance level.

Table 5-B

Structural change and market loans by type of borrower (1995-98)

The dependent variable is defined as $\ln(loans_i)$, where i indicates each type of borrower and is equal to: large non financial firms, small and medium-sized non-financial firms. The number of observations employed in the estimation is 380; province fixed effects and year dummy variables are included in each regression (coefficients for these variables are not shown). Standard errors are reported below coefficients.

Credit to:	Large Firms	Large Firms	Small and Medium-sized Firms	Small and Medium-sized Firms
Constant	22.015 *** 4.001	20.602 *** 4.128	16.833 *** 1.399	15.297 *** 1.253
Sh_merged_1	-0.697 *** 0.220	-0.539 ** 0.245	-0.420 *** 0.077	-0.150 ** 0.074
Sh_merged_2	-0.527 ** 0.214	-0.460 ** 0.217	-0.252 *** 0.074	-0.196 *** 0.066
Sh_merged_3	-0.365 * 0.204	-0.343 * 0.205	-0.084 0.071	-0.119 * 0.062
Sh_acquired_1	0.172 0.176	0.151 0.176	0.123 ** 0.061	0.091 * 0.053
Sh_acquired_2	0.293 * 0.152	0.244 0.155	0.161 *** 0.053	0.085 * 0.047
Sh_acquired_3	0.403 ** 0.167	0.350 ** 0.172	0.113 * 0.058	0.002 0.052
Entry_1	-0.275 0.228	-0.278 0.231	-0.486 *** 0.079	-0.429 *** 0.070
Entry_2	-1.167 ** 0.531	-1.116 * 0.567	-0.628 *** 0.185	-0.762 *** 0.172
Entry_3	-0.226 0.545	-0.220 0.553	-0.400 ** 0.190	-0.401 ** 0.168
Herfindahl_1	- -	-1.103 0.745	- -	0.572 ** 0.226
Branch_density_1	- -	0.081 0.064	- -	0.160 *** 0.019
Sh_smallbanks_1	- -	0.974 1.563	- -	0.386 0.475
Sh_smallbanks squared_1	- -	-1.015 1.630	- -	-0.826 * 0.494
LnGDP	-0.456 * 0.244	-0.397 0.248	-0.135 0.085	-0.092 0.075
Sh_subscredit_1	0.155 0.463	0.009 0.489	-0.281 * 0.161	-0.016 0.148
<i>R-squared (within)</i>	0.325	0.335	0.328	0.502
<i>F(18[14],267[271])</i>	9.33	7.50	9.47	14.95
<i>F(94,267[271]) that all ui= 0</i>	41.65	37.07	99.37	96.76

Note: Statistically different from zero, respectively, at: *** 99 percent, **95 percent and *90 percent significance level.

Table 6-A

Market odds ratios of bad loans by type of borrower (1990-98)

The dependent variable is defined as $\ln[(Bad\ Loans_i/Loans_i)/(1 - (Bad\ Loans_i /Loans_i))]$, where i indicates each type of borrower and is equal to: large non-financial firms, small and medium-sized non-financial firms. The number of observation employed in the estimation is 855; market fixed effects and year dummy variables are included in each regression (coefficients for these variables are not shown). The regression is estimated with weighted least squares. Values of zero for the volume of bad loans have been replaced with 1.

Odds ratio of bad loans for:	Large Firms	Large Firms	Small and Medium-sized Firms	Small and Medium-sized Firms
Constant	-6.852 *	2.625	-3.200 **	2.546
	3.503	4.022	1.587	1.747
Sh_merged_1	1.584 ***	1.697 ***	0.784 ***	0.863 ***
	0.369	0.373	0.216	0.210
Sh_merged_2	0.965 **	1.031 ***	0.259	0.335
	0.402	0.398	0.229	0.223
Sh_merged_3	0.541	0.732 **	-0.049	0.026
	0.377	0.372	0.220	0.212
Sh_acquired_1	-1.030 ***	-0.876 **	-0.629 ***	-0.539 ***
	0.382	0.376	0.199	0.191
Sh_acquired_2	-0.945 **	-0.883 **	-0.444 **	-0.431 **
	-0.387	0.379	0.203	0.194
Sh_acquired_3	-1.051 ***	-0.898 **	-0.519 **	-0.465 **
	0.401	0.396	0.210	0.203
Entry_1	0.169	0.352	0.122	0.213
	0.619	0.611	0.306	0.294
Entry_2	-1.786	-1.293	-0.524	-0.266
	1.358	1.334	0.650	0.625
Entry_3	-0.325	0.042	-0.259	-0.047
	1.322	1.297	0.642	0.617
Herfindahl_1	-	3.525 ***	-	2.737 ***
	-	1.092	-	0.620
Branch_density_1	-	-0.130 ***	-	-0.084 ***
	-	0.030	-	0.013
Sh_smallbanks_1	-	-2.720 **	-	-1.591 ***
	-	1.224	-	0.601
Sh_smallbanks squared_1	-	2.997 **	-	1.645 ***
	-	1.333	-	0.618
LnGDP	0.163	-0.328	0.046	-0.252 ***
	0.191	0.216	0.086	0.094
Sh_subscredit_1	1.573	2.230 **	1.949 ***	2.432 ***
	0.962	0.970	0.466	0.468
<i>Adj. R-squared:</i>	0.837	0.844	0.912	0.919
<i>F(117[113], 738[741])</i>	40.03	40.66	80.02	84.75

Note: Statistically different from zero, respectively, at: *** 99 percent, **95 percent and *90 percent significance level.

Table 6-B

Market odds ratios of bad loans by type of borrower (1995-98)

The dependent variable is defined as $\ln[(Bad\ Loans_i/Loans_i)/(1 - (Bad\ Loans_i/Loans_i))]$, where i indicates each type of borrower and is equal to: large non-financial firms, small and medium-sized non-financial firms. The number of observation employed in the estimation is 380; market fixed effects and year dummy variables are included in each regression (coefficients for these variables are not shown). The regression is estimated with weighted least squares. Values of zero for the volume of bad loans have been replaced with 1.

Odds ratio of bad loans for:	Large Firms	Large Firms	Small and Medium-sized Firms	Small and Medium-sized Firms
Constant	-43.008 *** 9.777	-33.915 *** 10.452	-23.675 *** 3.804	-16.885 *** 3.651
Sh_merged_1	2.440 *** 0.402	1.941 *** 0.435	0.868 *** 0.179	0.341 * 0.178
Sh_merged_2	1.797 *** 0.410	1.645 *** 0.413	0.570 *** 0.171	0.403 ** 0.158
Sh_merged_3	1.343 *** 0.364	1.402 *** 0.378	0.262 0.160	0.246 * 0.148
Sh_acquired_1	-0.676 0.417	-0.587 0.420	-0.213 0.161	-0.180 0.148
Sh_acquired_2	-0.870 ** 0.354	-0.591 0.364	-0.284 ** 0.132	-0.074 0.123
Sh_acquired_3	-0.589 0.388	-0.311 0.401	-0.299 ** 0.146	-0.070 0.137
Entry_1	0.088 0.543	-0.044 0.549	-0.294 0.191	-0.414 ** 0.177
Entry_2	-0.402 1.529	0.478 1.576	-0.695 0.528	-1.015 ** 0.499
Entry_3	0.414 1.493	0.096 1.511	-0.583 0.527	-0.833 * 0.489
Herfindahl_1	- -	-0.919 1.048	- -	0.132 0.435
Branch_density_1	- -	-0.401 *** 0.138	- -	-0.378 *** 0.050
Sh_smallbanks_1	- -	0.403 2.634	- -	2.437 ** 1.041
Sh_smallbanks squared_1	- -	0.327 3.136	- -	-2.696 ** 1.132
LnGDP	2.134 *** 0.535	1.726 *** 0.562	1.172 *** 0.208	0.865 *** 0.197
Sh_subscrcedit_1	-0.491 1.166	-0.685 1.193	0.256 0.441	0.242 0.419
Adj. R-squared:	0.935	0.937	0.982	0.985
F(112[108], 267[271])	52.19	51.31	198.08	232.34

Note: Statistically different from zero, respectively, at: *** 99 percent, **95 percent and *90 percent significance level.

Table 7

Market structure, credit volume and quality by type of borrower (1990-98)

In columns 1 and 2 the dependent variable is defined as $\ln(Loans_i)$, where i indicates each type of borrower and is equal to: large non-financial firms, small and medium-sized non-financial firms. In columns 3 and 4 the dependent variable is defined as $\ln[(Bad\ Loans_i/Loans_i)/(1 - (Bad\ Loans_i/Loans_i))]$, where i indicates each type of borrower and is equal to: large non-financial firms, small and medium-sized non-financial firms. The number of observation employed in the estimation is 855; market fixed effects and year dummy variables are included in each regression (coefficients for these variables are not shown). The regressions in column 3 and 4 are estimated with weighted least squares. Values of zero for the volume of bad loans have been replaced with 1.

Credit to:	Credit		Log-odds	
	Large Firms	Small and Medium-sized Firms	Large Firms	Small and Medium-sized Firms
Constant	14.354 *** 0.791	13.969 *** 0.291	3.786 4.059	2.862 1.765
Herfindahl_1	-1.112 ** 0.551	0.701 *** 0.203	3.455 *** 1.099	2.573 *** 0.625
Branch_density_1	0.015 * 0.008	0.011 *** 0.003	-0.128 *** 0.030	-0.083 *** 0.013
Sh_smallbanks_1	1.161 *** 0.443	0.718 *** 0.163	-2.486 ** 1.235	-1.729 *** 0.604
Sh_smallbanks squared_1	-1.191 ** 0.438	-0.786 *** 0.161	3.095 ** 1.351	1.871 *** 0.624
LnGDP	-0.001 0.046	-0.021 0.017	-0.388 * 0.218	-0.268 *** 0.095
Sh_subscredit_1	0.066 0.330	-0.193 0.121	1.818 * 0.982	2.349 *** 0.472
<i>R-squared: Within</i>	0.600	0.839	-	-
<i>F(94, 746) that all $u_i=0$</i>	50.64	116.21	-	-
<i>F(14, 746)</i>	80.15	287.07	-	-
<i>Adj. R-squared:</i>	-	-	0.837	0.917
<i>F(108, 746)</i>	-	-	41.79	88.52

Note: Statistically different from zero, respectively, at: *** 99 percent, **95 percent and *90 percent significance level.

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