

USING BANK MERGERS AND ACQUISITIONS TO UNDERSTAND LENDING RELATIONSHIPS

OVE REIN HETLAND AND AKSEL MJØS

ABSTRACT. Using a unique Norwegian dataset, which combines information on companies' bank accounts, annual accounts, bankruptcies, and bank mergers and acquisitions (M&As), we find that such M&As increase interest rate margins for nontransparent small and medium sized firms. There is little effect for more transparent companies. Since, due to information asymmetries, nontransparent firms are typically more dependent on bank lending relationships, our results indicate that these relationships are advantageous for such borrowers, and, conversely, the results are not consistent with the presence of a detrimental lock-in effect due to an information monopoly by the relationship lender.

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1. INTRODUCTION

Salvaging the value of banks' relationships with their customers has been put forward as one of the main reasons for bailing out banks during banking crises. Seminal work by Bernanke (1983) claimed that the destruction of such relationships contributed to the depth of the Great Depression in the US during the 1930s. This has spurred a large literature on relationship banking. One strand of this literature focuses on the information asymmetries between existing lenders and outside banks, which stems from banks possessing private information about their current debtors. This information asymmetry creates switching costs which limit businesses' ability to switch lenders and thus realize benefits from competition between banks (Sharpe (1990), Rajan (1992), von Thadden (2004)). Another theory is presented by Boot and Thakor (2000), where economic value is created through the lending relationship, implying that the relationship is potentially beneficial for both bank lenders and firm borrowers.

Previous research in this area has often focused on large companies due to data availability, particularly in the US. However, small and medium sized companies are usually less complex and more dependent on bank lending relationships. Given the combined size of these companies in the overall economy, understanding these relationships is therefore important.

We provide empirical evidence on the relative importance of these two contrasting theories. We use bank mergers and acquisitions (M&As) as events that are exogenous and potentially detrimental to existing firm-bank relationship. The predicted impact of a bank M&A on the borrowers varies between the two models. A bank M&A should have a positive effect on borrowers' credit terms if the event breaks up a bank lender's information monopoly, while the effect is potentially negative if the M&A event leads to the loss of the borrowers' share of the value added by the relationship. To our knowledge, ours is the first paper to use this approach to investigate these different theories of relationship banking.

This paper is organized as follows: Section 2 develops a simple theoretical framework. Section 3 has a literature review. Section 4 presents the data. We show the analysis in Section 5, with robustness checks in Section 6. Finally, Section 7 gives some concluding remarks.

2. THEORETICAL FRAMEWORK

2.1. **Theory.** There is no universally accepted definition of relationship banking in the literature. Boot (2000) defines relationship banking as:

The provision of financial services by a financial intermediary that:

- i. invests in obtaining customer-specific information, often proprietary in nature; and*
- ii. evaluates the profitability of these investments through multiple interactions with the same customer over time and/or across products.*

This definition is not specific on how to identify a lending relationship empirically. Relationship lending occurs when banks acquire proprietary information about its borrowers throughout the duration of the relationship. The alternative lending technology is transactional bank lending, where the bank is simply a passive intermediary in channelling funds from savers to borrowers, without any proprietary information. Without detailed data on the type of interactions and production of information which occur between the banks and the borrowing firms, it is impossible to directly distinguish between these two types of lending technologies.

We believe that bank mergers and acquisitions can be used as a "natural experiment" to shed some light on the existence of bank-firm lending relationships, and in particular what effects these relationships have on small and medium sized companies' access to credit. Such M&A events often occur for reasons unrelated to the individual lending relationship between a bank and a specific borrowing firm. But since M&As usually cause substantial

reorganizations of the involved banks, and may temporarily or permanently affect the banks' lending operations, it is plausible that such events may have implications for firms' borrowing relationships with the affected banks. For example, Stein (2002) develops a model where consolidation into larger and more hierarchical banks affects their abilities to advance loans based on "soft" (i.e. proprietary) information.

Note that we primarily focus on the effects of M&A events on the individual firm's bank financing. There may exist other effects, such as increased market power if two banks with significant market positions merge. For our purpose, it is important to distinguish between these two effects on companies' access to credit, and to this end we control for regional lending market concentration.

We can think of two distinct effects of bank M&As, with opposing implications on a firm's credit availability. On the one hand, if an existing relationship has led to a "lock-in" effect on the customer, its destruction will have benefits for the borrowing firms, since the "lemon" problem when approaching an external, less informed, bank is reduced. Following a bank merger, other banks may face a more attractive pool of loan applicants, and therefore compete more fiercely for the merging banks' customers. On the other hand, the adverse changes to the relationship may reduce synergies enjoyed by both the lender and the borrower, leading to worse credit terms *ex post*.

The main focus of the paper is on the effects of bank M&As on bank financing measured at the firm-level. We also include an analysis of the effects on individual bank-firm relationships and the results are consistent with the main findings.

In the following section, we present a simple model to illustrate these two different stories more clearly.

2.2. The Model. We consider a model that incorporates the ideas of both Sharpe (1990) and Rajan (1992), and of Boot and Thakor (2000). The model bears some similarities to Dell’Ariccia and Marquez (2004).

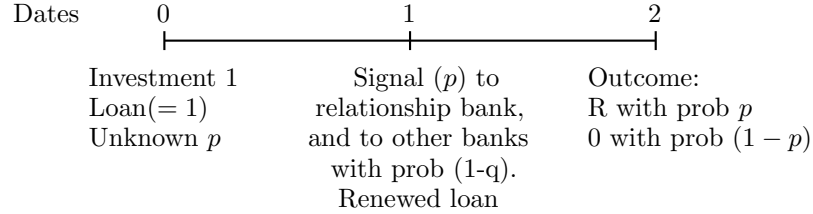
The economy consists of banks (lenders) and firms (borrowers). The banks compete to lend to the firms. There are three dates in the model. Each firm has access to one project that requires external financing of 1 at date 0. There is a continuum of project types, denoted $p \in [0, 1]$, where p is a project’s probability of success. If successful, a project pays off R at date 2, otherwise, the payoff is zero. The cost of funds for all banks is normalized to one. We assume that $\bar{p}R \geq 1$, where \bar{p} is the mean value of p in the population.

Both the banks and the firms are risk neutral, and we assume that firms have no initial wealth. The firm’s project type p is private information for the firm at date 0. Firms cannot credibly signal their type to the banks at this stage. The firm applies for a loan at date 0, to be repaid at date 1. The borrower requires renewed funding from date 1 to date 2, and therefore needs to apply for a loan at date 1 to repay her initial loan. The new loan is repaid if the project is successfully realized at date 2.

At date 1, the bank which became a lender to a firm at date 0 (the relationship bank) receives a signal about the borrower’s type. For simplicity, we assume that this is a perfect signal, i.e., the bank gets to know the borrower’s type with certainty. External banks, currently not lending to a given firm, receives the same signal with probability q . We assume that either all or none of the external banks receive this signal. There is thus competition at date 1 between external banks if a signal is received. External banks therefore offer the following break-even interest rate at date 1

$$r_{ext} = \frac{1}{p}.$$

FIGURE 1. Timeline



If no signal is received, we assume external banks will not offer any loan due to the "lemons" problem. (Simply assume that $p_{min}R \leq 1$, which is fulfilled if $p_{min} = 0$.)

Boot and Thakor (2000) develops a model based on the idea that a relationship improves the bank's ability to grant credit. For example, when giving the firm a loan at date 0, a bank performs certain actions which facilitate repeated interactions with the firm. One way to model this is by assuming that the probability of project success is increased once the firm is in a bank relationship. At date 1 the bank is able to make an investment into its existing customer relationship (perhaps at some cost c), such that the revised success probability of the firm's project is

$$\tilde{p} = p + \theta$$

for some $\theta \geq 0$. This revised probability is conditional on the relationship continuing. Hence, changing bank at date 1 would lead to the loss of the relationship specific increase (θ) in the project's success probability.

The relationship lender must decide between offering a high interest rate, and thus capture only the borrowers which do not receive an offer from external banks, or offer a low interest rate and capture all borrowers. The

expected profit from offering a low interest rate, $r_{low} = \frac{1}{p}$, is:

$$\Pi(r_{low}) = (p + \theta) \frac{1}{p} - 1$$

The expected profit from offering a high interest rate, $r_{high} = R$ (where relationship bank captures all project NPV), is:

$$\Pi(r_{high}) = (1 - q) ((p + \theta)R - 1)$$

The relationship lender will offer a low interest rate if $\Pi(r_{low}) \geq \Pi(r_{high})$. This gives:

$$q \geq \frac{(p + \theta)(R - \frac{1}{p})}{(p + \theta)R - 1}$$

Define the function $q^*(\theta)$ as the value of q for which this inequality binds:

$$q^*(\theta) = \frac{(p + \theta)(R - \frac{1}{p})}{(p + \theta)R - 1}$$

This function is monotonously decreasing in θ . Thus, if the value created through the relationship is large, as proxied by a large value of θ , the relationship lender is more likely to offer a low interest rate to its existing borrowers. In this case, we do not experience a lock-in effect from the information monopoly that the relationship lender has.

If we assume competition at date 0, the banks are willing to reduce interest rates in the first period in order to win customers and secure rents in the second period. However, we will not focus on the timing effects here, since we limit our analysis to firms which already are bank borrowers.

However, if the relationship bank were to merge with another bank, the merging process could lead to the loss of the information obtained from the signal about individual customers. If so, the merging bank will compete for the renewed loans at time 1 on equal terms with external banks. If a signal is received, the interest rate offered will be:

$$r_{ext} = \frac{1}{p}$$

If no signal is received about a firm, the banks will offer an interest rate based on the population average (a 'pooling' outcome):

$$r_{avg} = \frac{1}{\bar{p}}$$

We can think of the probability of external banks getting informed, q , as a measure of the asymmetric information for a given group of borrowers. Typically, borrower accounting information is available. For companies where noncurrent, tangible assets (long-term financial investments and physical assets, e.g., property, machinery etc.) constitute a large fraction of total assets, we expect information asymmetries to be smaller. These assets may be used as collateral for bank loans, and they are arguably more difficult for management to divert for personal benefits. Additionally, the liquidation or resale value of current assets like accounts receivables and inventories is usually more uncertain than that of, e.g., real estate. Therefore, we expect q , the probability of a signal to external banks, to be lower for firms with a large fraction of current or intangible assets on the balance sheet. We call these firms 'opaque' for our purposes. Since a low q value increases the occurrence of a high interest rate charged by the relationship lender, opaque firms should suffer the most from the information monopoly lock-in effect.

2.3. Empirical Predictions. We expect different categories of M&As to have diverging effects on lending relationships. Generally, a merger between two banks with significant operations in the domestic market (in-market mergers) is more likely to lead to organizational changes and potential severing of relationships. On the other hand, a purchase of a domestic bank by a foreign bank, without overlapping operations in the domestic market, would not be expected to cause direct changes in the acquired bank's lending relationships with its customers.

We summarize our predictions in Table (1). We distinguish between the two alternative theories, as discussed above, where *Information asymmetry* refers to the situation in which firms are locked into the existing relationship

due to the "lemons" problem, while *Relationship synergies* concerns the case where firms at least partially benefit from the value added through the lending relationship with a bank.

We define three categories of bank M&A events. We expect the strongest effects from a domestic merger. A borrower will experience greater availability and more favorable terms of credit if the event breaks a relationship associated with a hold-up problem. On the other hand, if a relationship is valuable to a firm, we expect a negative effect of the merger from the firm's point of view.

A domestic bank acquisition is a more ambiguous category. We use this category when a target bank is not fully legally and operationally integrated with the acquiring bank. There are only two significant events in this category in our sample. The first is Vår Bank, which was bought by an alliance of larger savings banks in the year 2000. The loan portfolio was subsequently distributed among the acquiring banks. The second is Nordlandsbanken, which was purchased by Den norske Bank in 2003, but continued to operate under its own brand name and remains a separate legal entity after the acquisition. Since the extent to which these events caused direct borrower-related organizational changes is probably less than for ordinary mergers, we do not impose any firm predictions on this category.

The foreign acquisitions of Norwegian banks differ from the other events. During our sample period, they mark the expansion of large Nordic (foreign) banks into a new market where they formerly did not have any significant presence. On some occasions, such takeovers could change the credit granting procedures in accordance with group policy, implying a potential severing of relationships. On other occasions, the purchase may reflect the foreign bank's expansionist strategy, and therefore lead to improved terms after the acquisition in order to capture customers. Therefore, we expect, on average, no short-term effect on firms' credit availability from foreign purchases of domestic banks.

The table below summarizes the predicted effects of bank mergers and acquisitions on firm-bank relationships under the "Information asymmetry"- and the "Relationship synergy"-theories, respectively.

TABLE 1. Empirical Predictions

	<i>Information asymmetry</i>		<i>Relationship synergies</i>	
	Interest Rate	Loan size	Interest Rate	Loan size
Domestic (in-market) mergers	÷	+	+	÷
Domestic (in-market) acquisitions	?	?	?	?
Foreign acquisitions	0	0	0	0

3. LITERATURE REVIEW

Bank loans represent the largest source of debt-financing for companies and is particularly important in the capital structure of small and medium sized private companies. There is a large literature on firms' capital structure, and their optimal choices between debt and equity. Traditional theories focus on firms' trade-off between the tax-advantages and distress costs from debt-financing. The main alternative theory has been more concerned with explaining capital structure by informational asymmetries between the company and its outside financiers (pecking order theory). Borrowing from financial intermediaries such as banks is one potential way to alleviate information costs. For example, Diamond (1984) suggests that there are economies of scale in screening and monitoring borrowers, hence motivating the banks' role as delegated monitors and lenders in the financial markets.

Corporate bank financing is traditionally split into two categories:

- *Relationship banking*: Banks invest in acquiring private information about the borrower both initially and over time, and
- *Transactional lending*: (see, e.g., Boot (2000) and Berger and Udell (2006)) Banks rely on verified, 'hard' data and obtain no particular informational advantage compared to other competing banks.

Freixas and Rochet (2008 (2nd ed.)) refer to relationship banking as *"the investment in providing financial services that will allow dealing repeatedly with the same customer in a more efficient way."*

A bank that enters into a close relationship with the customer must then optimally invest in acquiring credit relevant information. Extensive theoretical and empirical research aims to understand how banks relate to corporate borrowers.

Sharpe (1990) and Rajan (1992) initialized the relationship banking literature by showing how monitoring by banks could lead to ex-post information monopolies for the incumbent lenders in a multiperiod setting. The borrowing firms face the risk of a hold-up situation since uninformed potential lenders are impeded from competing since they face a winner's curse. Petersen and Rajan (1995) show that a hold-up situation could have beneficial consequences if it allows the financing of risky, but socially desirable, projects which would otherwise not have been funded. The relationship bank's commercial rationale is to offer low initial interest rates to capture new borrowers, in order to reap future rents as these customers become locked-in. This possibility exists as long as the borrower will not be able to tap new (typically uninformed) sources of credit in the future. In a separate paper, Petersen and Rajan (1994) showed that relationships increased the availability of financing for small and medium sized US firms.

In its classical form, the investment into private borrower information makes the bank better able to distinguish between various types of companies, whilst alternative models, e.g., Boot and Thakor (2000) assume that the involved relationship bank actually improves the borrowers' prospects (One can probably also think about a relationship as alleviating potential moral hazard problems between the bank lenders and its borrowers). Dell'Ariscia and Marquez (2004) model banks with different information about the quality of borrowers and different funding costs. This leads to a trade-off between

funding costs and information. Ongena and Smith (2001) explain the duration of bank lending relationships by a firm's trade-off between the benefits of relationships synergies and the disadvantage of information monopolies. Recent extensive surveys of the relationship banking literature include Boot (2000), Freixas (2005), Udell (2008), and Degryse et al. (2009).

Several recent empirical papers study the effects of mergers, although with different approaches, and using more limited datasets than our analyses. Berger et al. (1998) study the effects of US bank M&As on the banks' total amounts of lending to small businesses. They find that the static effect of such transactions is reduced lending to small businesses, but that competitors to a large degree offset this by increased lending. The paper focuses on the supply-side of the credit-market without including borrower or market characteristics in the analysis.

The banking market in Italy is well documented and has been the basis for several papers on banking mergers. Sapienza (2002) uses an extensive Italian dataset of banking relations in the form of credit lines to small business customers. The paper studies the effect of banking mergers on the individual borrower and in particular the interest rate margin charged. She finds that in-market mergers involving smaller banks create efficiency gains that benefit borrowers, whilst mergers with larger banks result in market power and increased interest rates. The effect on an individual firm is also subject to its number of lenders. Bonaccorsi di Patti and Gobbi (2007) also use Italian data on banks, borrowers and banking M&A-activity. They find a persistent negative effect of bank M&As on firm credit, the termination of banking relationships, and on firm investments. We take a similar approach, although with the benefit of population data and in a different market setting.

Karceski et al. (2005) study the effects of banking M&As in Norway on listed Norwegian companies and find a small negative announcement effect on share prices. They also find an increased number of terminated banking relationships, but do not study the effects on overall firm credit. By focusing

solely on listed firms, the paper excludes any effects on small businesses. Erel (2009) analyzes the effects of banking M&As on US commercial loans and the interest spreads paid by borrowers. The main finding is that most mergers lead to reduced spreads subject to actual efficiency gains obtained in the merger.

Degryse et al. (2010) study Belgian corporate borrowers of banks involved in mergers. The focus is on small and medium sized firms and their subsequent performance explained by whether they continue the relationship, are dropped, or switch bank post-merger. They find that borrowers of target banks which lose the relationship without being able to replace it have significant negative effects from bank mergers. Our focus differs from theirs, as we are interested in the direct effects of mergers on the key aspects of a borrowing relationship, i.e., loan size and interest margin, as opposed to the effects on overall firm development. Our approach better allows us to directly test and compare the main theories of relationship banking.

Our advantages compared to previous studies of the impact of bank M&As on lending relationships are twofold. First, we have more comprehensive data. This is particularly relevant compared to the US, where research on small and medium sized companies has mostly been based on survey data. Second, compared to, e.g., the Italian bank lending market, the Norwegian bank lending market is arguably more representative for most other national markets. In Italy, the number of bank relationships per firm is comparatively high, while most Norwegian firms have a single bank lender. It is dubious whether changes in a single relationship is very important for firms that borrow from several relationship banks. We expect information asymmetries to be larger, and thus relationships to be stronger, for firms with fewer bank relationships, thus making our sample more relevant for this purpose.

Additionally, our main focus is to use M&A events to better understand lending relationships, not to learn about the M&A events per se.

4. DATA PRESENTATION

4.1. The Norwegian banking market. Norway is an open, advanced economy with a remarkable availability of relevant micro-data which both allows for uniquely precise empirical research and makes the results generally applicable. Norway is, according to Eco (2009) using primarily data for the year 2006, the 25th largest economy in the world (GDP), and has the second highest GDP per head. The combined market capitalization of the listed companies amounted to 83.4 % of GDP¹ and the country is in 14th place at par with Germany on Transparency International's corruption index. The population is 4.7 mill. as of end 2008.

The Norwegian banking market includes 123 savings banks, 17 commercial banks incorporated in Norway and 8 branches of foreign commercial banks (as of end 2008). The corporate lending market is highly concentrated with a combined market share of the two largest banks of 57 percent and a national Herfindahl-Hirschman index of 0.2 (as of end 2007).

During our sample period, the consolidation of the bank sector lead to several mergers and acquisitions. These events involved both large and small banks. The end-of year 2008 total market share of banks, which had been involved in an M&A event during the sample period 1998-2007, exceeded 80 percent.

4.2. The Datasets. Our analysis benefits from complete population data from Norway on both public and private companies as well as their bank relationships. We apply three main data-sets covering the all company annual accounts, bank accounts and company bankruptcies in Norway for up to 16 years. We also include detailed data on bank mergers and acquisitions.

The combined data-set provide for a comprehensive description of the relationships between companies and banks as well as the possibility of analyzes without any cross-sectional selection biases.

¹Source: The World Bank

The (Norwegian) National Registry of Business Enterprises² allocates all business entities a unique organizational number which is used for general company identification and allows for connecting complementary sources of data.

4.3. The banking database. The Norwegian Tax Administration has since 1997 electronically collected annual statements of all deposit- and lending-accounts from all banks and other financing counterparties³. The statements are made for each separate (bank-)account and include end-of-year balances, total amounts of interests earned (deposits) or accrued (loans) during the preceding year, and also paid or restituted previously defaulted interest payments on loans. The statements also include an account number, and the name and organizational number of both the customer and the bank/reporting entity. This organizational number allows for linking the data to registries with, e.g., accounting and corporate information. Interests on loans include any related fees or commissions in addition to regular (proportional) interest amounts⁴. The database is confidential, but has in its entirety (1997 - 2008) been made available to us by the Norwegian Ministry of Finance⁵ under strict confidentiality conditions regarding disclosure of the identities of the contracting parties. Table (3) illustrates the scale and composition of the total database before any exclusions.

The database includes both limited companies, partnerships, and any other non-governmental entities as clients, and both banks, cooperatives, insurance companies, municipalities, public sector financing entities, law

²Presented also in English at www.brreg.no.

³The Tax Administration collects such data both for individuals and corporations, but our research focus lead us naturally to only apply for the corporate data. Data on individuals' accounts would, if at all available, be provided under far more restrictive conditions.

⁴The database does not contain information on collateral, currency, loan covenants, maturity or other contractual terms.

⁵Approval gratefully received by letters dated 12 November 2008 and 27 August 2009.

firms, and other categories as providers of loans and/or deposits. The only accounts missing are direct commercial banking business by foreign banks without any presence in Norway. However, branches of foreign banks are included which leads us to believe that the problem is limited to few and predominantly large corporations. All accounts are held by single legal entities, as opposed to consolidated groups of companies, and this applies to both sides of the market. The theoretical basis for the study of banking relationships, as for most corporate finance research, assumes profit maximizing behavior by the agents, which necessarily impacts the selection of data in empirical research. Our research thus study commercial companies' banking relationships and we consequently limit our dataset to limited companies and to regular financiers with commercial objectives. The latter includes commercial banks (limited and foreign branches), savings banks, private insurance companies and any subsidiaries of such. Savings banks and mutual insurance companies have no equity owners in the traditional understanding of the term, but are included since they may be expected to act commercially in the market place even though the net profits are distributed in a different manner compared to, e.g., commercial banks. By assuming that none of the member companies of a consolidated banking or insurance group would wish to actually compete for a specific customer, we have conducted a detailed study of the banking group structures and the mergers and acquisitions in the sector on a yearly basis during the period. We consider all consolidated banking groups in a given year as one entity for the purpose of the analysis.

Our database of bank accounts is unique in its level of details, that it covers the whole national population of companies, the inclusion of deposits, and the identification of all contracting parties in a way which allows both for consolidating the providers (lenders) and for combining the data with complementary data-sets.

4.4. The accounting database. We use annual accounting data for all Norwegian private and public limited companies for the years 1992 - 2007. Norwegian companies have, with very few exceptions, a financial reporting year equal to the calendar year. Companies are obliged to have an authorized auditor, and to file their annual financial accounts with the The National Registry of Company Accounts⁶ by end of July the year after the accounting year. The dataset includes both single company accounts and consolidated accounts and is made available by Dun&Bradstreet. Large and medium-sized Companies owning subsidiaries (ownership $\geq 50\%$) have to file both company accounts and consolidated accounts. As of now, we choose to only use the company accounts (as opposed to consolidated accounts) since the banking database also reports accounts at this level and since exact group compositions and structures are incomplete during most of the period. The database includes specified profit and loss accounts, balance sheet, selected items from the notes to the accounts, and other company related information such as, e.g., 5 digit industry codes and legal form. See Table (4) for an overview of Norwegian companies generally and bank borrowers in particular.

As discussed above, this paper focuses on the banking relationships of private limited liability non-financial companies. Financial institutions have fundamentally different financing structures which have to be studied separately. We have also excluded public sector non-commercial companies. The database is further described in Mjøs (2007) and Mjøs and Øksnes (2009). The selection of companies studied in this paper is defined by this methodology and subsequently applied towards the banking database. The strength of this database is that it covers the Norwegian population of companies, the common organizational number allows for applying a total of 174 variables to all banking customers, the accounts have been approved by an auditor, and there are records of company information for up to 16 years.

⁶Presented also in English at www.brreg.no.

4.5. Bank mergers and acquisitions. There have been several bank mergers and acquisitions in Norway over the sample period, as listed in Table (5). This list is based on information found on the websites for the Norwegian Savings Banks Association and the Norwegian Financial Services Association⁷. The transactions are classified into three groups: Domestic mergers, Domestic acquisitions and Foreign bank mergers and acquisitions. The first group is used for most events involving Norwegian banks, unless it was clearly an event we believe only affected the target bank due to the dominance of the acquiring bank. "Foreign bank mergers and acquisitions" was used whenever a foreign bank was involved.

5. EMPIRICAL ANALYSIS

5.1. Research Design. Our regression equation is:

$$(1) \quad Y_{it} = X_{it-1}\beta + Z_{it-1}\gamma + \epsilon_{it}$$

The alternative dependent variables, (Y_{it}) , are:

$$LoanLagSize = \frac{Total\ bank\ credit_{it}}{Total\ assets_{it-1}}$$

$$Interest\ rate\ margin_{it} = \frac{Interest\ paid_{it}}{\frac{1}{2}(Bank\ Loan_{it} + Bank\ Loan_{it-1})} - NIBOR3m_t$$

Explanatory variables are generally lagged one year compared to the dependent variables. We include a vector Z_{it-1} of firm, bank, and market control variables, which are described in Table (6). We control for *Size*, as measured by the log of total assets. Larger companies are usually more transparent than smaller companies, which could affect their access to credit. Also, if the granting of a loan has some fixed cost element, small loans may

⁷www.sparebankforeningen.no and www.fnh.no, respectively.

become prohibitively expensive. Fixed and tangible assets can potentially be used as collateral, which a company can put forth against a loan. We therefore include *Tangibles*, which is the share of total assets which consists of noncurrent tangible assets, i.e., physical assets and long-term loans and investments.

High cash flow and large amounts of cash on the balance sheet increase a company's opportunities to finance projects by internal financing. We therefore include *Ebitda_assets* and *Cash_assets*. Alternatively, a large cash balance could indicate that a firm is financially constrained, in the sense that it has to keep a large amount in cash to offset unexpected payment obligations because it does not have access to necessary financing. We generally find that the presence of large cash buffers reduces the amount that a firm borrows, but it also reduces interest rates paid. A company's bankruptcy probability, calculated as described in the appendix, affects its ability to raise external finance. However, we find the somewhat surprising result that firms with a high bankruptcy probability tend to borrow more than firms with a low bankruptcy probability. This could give some important indications about the workings of small firms. The finding suggests that companies that borrow are those companies which have performed poorly in previous years, and are thus in a greater need of renewed financing than firms which have performed better, as predicted by the pecking order theory, will finance their projects with internal capital.

The availability of external credit at a given point in time is potentially affected by whether the firm already borrows from one or multiple banks. On the one hand, borrowing from several banks imposes deadweight costs through the duplication of for example administrative and monitoring costs. But, on the other hand, a company is less exposed to the "lock-in" problem stemming from the relationship lender's information monopoly. We include both a dummy variable, *Multibank*, indicating whether the firm borrows from

several banks, and a measure of how concentrated the firm’s borrowing is, `textitrel_hhi_utlaan`.

Finally, we include various controls for the concentration of the commercial bank loan market of a firm’s region and industry, and the market share of the firm’s largest lender in the national, industry and regional market, respectively.

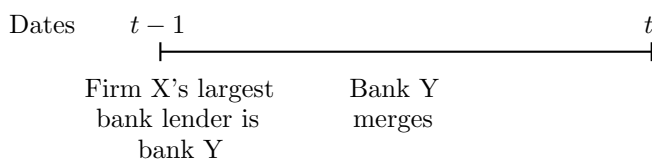
All regressions include firm and year fixed effects. The coefficients on the fixed effects and the control variables are not reported. Our analysis includes companies whose average total assets over the sample years in which they exist are greater than NOK 500,000 and less than NOK 100,000,000⁸. Since our control variables include characteristics of the start-of-period firm-bank borrowing relationship, we exclude any observations, with a date t dependent variable, when a company was not a bank borrower at date $t - 1$.

5.2. Overall effect of M&A on borrower firms. Table (8) shows regression results when the bank M&A variables vector, X_{it-1} , includes dummy variables indicating whether a firm’s largest lending bank at date $t - 1$ was involved in an M&A in the following year (i.e., between date $t - 1$ and date t , see Figure 2). The variables for the three main M&A categories are denoted *Normernext_top*, which equals one when the firm’s largest bank lender is involved in a domestic merger, *Noracqnext_top* is equal to one when the firm’s largest lender is the target of a domestic acquisition, and, finally, *Foracqnext_top* indicates whether the company’s largest lender was a the target of a foreign acquisition.

There are no indications that a domestic merger has caused changes to the involved banks’ borrowing customers. For both domestic and foreign acquisitions, customers have benefited from lower interest rates after the purchase, and foreign acquisitions have also lead to increased availability of credit. This supports the hypothesis that foreign banks which enter the

⁸The average exchange rate USD/NOK was 7.34 during our sample period. The respective amounts in USD based on this exchange rate was therefore \$68,100 and \$13,624,000.

FIGURE 2. **Timeline:** M&A variable (X_{it-1}) equals one for firm X in the following situation:



domestic market follow an expansionist strategy, and act aggressively to win market shares. The effects are economically significant. A foreign purchase increases a target borrower firm's leverage ratio by on average 2.5 percentage points.

We define the largest bank in a merger, measured by total assets at the last year-end before merger, as being the acquiring bank, whilst the smallest bank is considered the target bank. Table (9) indicates that borrowers of merger targets are more adversely affected than borrowers at the acquiring bank. The interest rate charged increases by 0.12 percentage points for target customers, while there is little effect on the acquiring bank's customers.

5.3. Regional market power. We study whether bank mergers and acquisitions influence regional market power. If a bank loan market is relatively concentrated, we expect mergers to have a detrimental effect on firms borrowing in this region, since the merger would further reduce competition. However, if many lenders with non-trivial market shares are present in the region, a single merger would not have large effects, since businesses still have several alternatives for obtaining credit.

We apply a division of Norway into 161 geographical regions, which are defined as local labour market regions. By calculating bank loan market concentration indices for each of these regions, using the traditional Herfindahl-Hirschman index measure, and multiplying this with the M&A dummy variable, we can study how the effects of M&As differ between regions of various degrees of market competition.

The results are shown in Table (10). The results suggest that market concentration is of little importance. An objection to this conclusion is that our test is too coarse, and that we ignore more subtle consequences of potential market monopoly power. Since we use firm fixed effects, we lose all between-firms variation, and this may also explain our lack of results. We therefore find it difficult to make strong conclusions based on this analysis.

5.4. Effect on Lending Relationships. Table (11) shows regressions where the M&A dummies are multiplied by *Opaqueness*, a measure denoting the extent to which the firm is non-transparent. This measure refers to the parameter q in the model in Section 2.2. We define this measure simply as:

$$Opaqueness = 1 - Tangibles$$

Since opaque firms have less fixed assets to use as collateral, the extent to which they will repay a bank loan is highly dependent on their future cash flows. This increases potential information asymmetries, and we therefore expect opaque firms to be more dependent on bank relationships. Accordingly, companies with a high share of non-current assets can more easily approach competing banks, using their fixed assets as collateral.

We see that reducing non-current tangible assets from 100 percent to 0 percent of total assets increases effect of a Norwegian merger on the interest rate paid by the company by 0.24 percentage points. This compares to the sample average interest rate margin of 4.0 percent. This result is not consistent with an information monopoly hypothesis along the lines of Sharpe (1990) and Rajan (1992). On the contrary, the results are more

compatible with theories predicting *Relationship synergies*, where the borrowers share some of the benefit from the value created through the lending relationship. This supports the ideas of both Boot and Thakor (2000) and Bernanke (1983), and suggests that there are potentially economic losses from destroying banking relationships through bank M&As.

5.5. Analysis on the individual Bank Firm Relationship Level. Tables (12) and (13) show regressions with bank-firm-years as the observation level. That is, instead of combining all information about a firm for a given year into a single observation, we keep each firm-bank relationship within a given year as an individual observation. The M&A variables used here are indicator-variables for whether the bank in an individual relationship is involved in some M&A event, irrespective of whether this bank is the main bank lender for the company.

The results from Table (12) suggest that the loan amount within the relationship tends to decrease following a domestic merger. Since we do not find any significant comparable effects in Table (8), the combined findings indicate that individual firms are able to accommodate the decrease in loan availability from the merging banks by borrowing from other banks. This result indicates that such mergers do not create significant and exploitable market power for the merging banks.

In Table (13), we see that more opaque firms pay relatively higher interest rates to a bank that merges. The effect is around 0.40 percentage points during the first year after the event, which is somewhat larger than the 0.24 percentage points that we find in Table (11).

6. ROBUSTNESS

We also run standard OLS regressions, and find that generally interest rates increase and loan size decreases after a domestic merger. For opaque firms, interest rates tend to increase more than for more transparent companies. These results are in line with the main analysis.

7. CONCLUSIONS

This paper documents the effects of bank mergers and acquisitions in the Norwegian market on firms' access to credit. Domestic bank mergers during the sample period tended to reduce loan availability and increase interest rate margins for borrowers. Our findings are consistent with bank relationships being beneficial for the companies. Nontransparent firms, which depend the most on such relationships, suffer more from bank mergers than more transparent firms which can more easily tap alternative sources of bank financing. We argue that a likely reason for this is that mergers are detrimental, by terminating valuable lending relationship.

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APPENDIX A. BANKRUPTCY DATA AND PREDICTIONS

A.1. The bankruptcy registry. Norway has since September 1993 collected information on all bankruptcies in a National Registry of Bankruptcies⁹. We have access to the complete database from the inception until 2009, a total of 50,392 company bankruptcies. This also includes bankruptcies where the company subsequently has entered into regular operation again. The database includes information on the identity (and organizational number) of the bankrupt company, date of opening and closing of the bankruptcy procedure, categories of bankruptcies and reasons for closing, as well as some incomplete information as to the repayments to claimants. Table (2) shows the number of corporate bankruptcies by year. The bankruptcy registry allows for identification of explicit legal bankruptcies as opposed to only noting if a company leaves the sample. The combination of the bankruptcy registry with the accounting database also allows for modelling bankruptcy probabilities, as presented and discussed below. We believe the inclusion of this database to add important precision to our study of the effects of banking M&As on banking relationships.

A.2. The Sebra model of bankruptcy probability. Norges Bank, the Central Bank of Norway, applies the Sebra model to analyse risk in the corporate sector and predict company specific bankruptcy probabilities. The model is well documented, see, e.g., Eklund et al. (2001). The model is a logit model where bankruptcy is a binary variable which takes the value 1 in a firm/year-observation if it is the last year a company files its annual accounts and it also enters a formal bankruptcy process within 3 years. The model is estimated using population accounting data for Norwegian companies and the explanatory variables are earnings/total assets, (liquid assets - short term debt)/turnover, unpaid indirect taxes¹⁰/total assets, trade credit/total assets, equity/total assets, book equity < paid-in equity (0/1), dividend payments (0/1), industry average equity/total assets, industry average trade credit/total assets, industry standard deviation for earnings/total assets, age dummies (years ≤ 8), and total assets.

⁹Presented also in English at www.brreg.no.

¹⁰Typically VAT.

We apply the model in a slightly modified form utilizing the accounting database and the bankruptcy database described above instead of the historic estimates of coefficient given in Eklund et al. (2001). This both allows for more updated predictions and for a systematic, rolling, distinction between in-sample estimations and out-of-sample predictions for each year in the database.

Year	Number of Bankruptcies
1993*	1,032
1994	2,755
1995	2,655
1996	2,528
1997	2,478
1998	2,468
1999	3,023
2000	3,544
2001	3,807
2002	4,163
2003	4,398
2004	4,126
2005	3,089
2006	2,870
2007	2,830
2008	3,746
2009*	880
Total	50,392

TABLE 2. Total number of new corporate bankruptcy cases opened in Norway by year of opening. Years marked by * does not represent full year observations. Source: The (Norwegian) National Registry of Bankruptcies.

Year	Customers	Number of <i>Fin. providers</i>		Rel.ships			per cust: <i>Mean</i>
		Single	Groups	Lending	Deposits	Total	
1997	218,853	542	439	176,571	286,919	325,638	1.953
1998	234,540	544	448	178,696	304,349	342,531	1.911
1999	253,472	551	453	185,466	315,823	352,856	1.784
2000	264,772	552	446	180,461	327,214	362,610	1.765
2001	280,149	550	444	179,092	344,559	385,107	1.782
2002	225,875	528	435	155,284	284,405	320,409	1.906
2003	232,778	531	440	156,267	288,829	325,802	1.867
2004	238,670	523	449	157,929	277,225	322,914	1.773
2005	256,085	520	449	164,629	299,167	344,474	1.741
2006	288,440	498	428	173,306	344,800	385,995	1.723
2007	312,786	496	429	177,837	377,583	418,533	1.726
Average	255,129	530	442	171,413	313,716	353,352	1.812

TABLE 3. Number of observations across the years 1997-2007 from the banking database covering all corporate bank accounts reported to the Norwegian Tax Authorities.

E-mail address, Ove Rein Hetland: `ove.hetland@nhh.no`

DEPARTMENT OF FINANCE AND MANAGEMENT SCIENCE, THE NORWEGIAN SCHOOL OF ECONOMICS AND BUSINESS ADMINISTRATION, HELLEVEIEN 30, N-5045 BERGEN, NORWAY

E-mail address, Aksel Mjøs: `aksel.mjøs@nhh.no`

DEPARTMENT OF FINANCE AND MANAGEMENT SCIENCE, THE NORWEGIAN SCHOOL OF ECONOMICS AND BUSINESS ADMINISTRATION, HELLEVEIEN 30, N-5045 BERGEN, NORWAY

TABLE 4. Key statistics across the years 1997-2007 for Norwegian companies and corporate bank borrowers. Data from the banking database for Norwegian limited companies reported to the Norwegian Tax Authorities. Companies with less than NOK 100,000 in assets, missing accounting information, or which went bankrupt are excluded. The following industry groups are also excluded, according to the classification of NACE Rev. 1.1(NACE: Nomenclature statistique des activités économiques dans la Communauté Européenne, EU's industry-classification system): 65 Financial intermediation, except insurance and pension funding, 66 Insurance and pension funding, except compulsory social security, 75 Public administration and defence; compulsory social security, 91 Activities of business, employers and professional organizations and 95 Activities of households as employers of domestic staff. Financial debt equals interest bearing debt as recorded in the company accounts. Amounts indexed to 2007, means and in NOK 1000.

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
	<i>All companies:</i>										
<i>N('000)</i>	87	94	99	106	109	113	118	122	131	141	154
NOK1000											
Total assets(TA)	29,031	30,711	33,392	35,975	35,762	35,391	34,993	37,661	40,134	41,769	44,804
Financial debt	9,240	10,408	11,432	13,182	13,319	13,968	12,728	13,316	14,412	15,262	14,018
Bankdebt	3,449	3,727	3,652	3,867	3,965	3,862	3,837	3,797	3,816	4,081	4,438
Bankdebt/TA	0.21	0.20	0.19	0.19	0.19	0.19	0.18	0.18	0.17	0.17	0.16
Bankdebt/F.Debt	0.30	0.29	0.28	0.27	0.27	0.27	0.26	0.25	0.24	0.23	0.23
Deposits	193	239	266	277	303	281	228	157	148	170	231
Deposits/TA	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01
	<i>Bank borrowing companies:</i>										
<i>N('000)</i>	43	45	47	50	52	54	56	59	62	64	68
NOK1000											
Borrower fraction	0.49	0.48	0.48	0.47	0.48	0.48	0.48	0.48	0.47	0.46	0.44
Bankdebt	7,038	7,833	7,686	8,183	8,223	8,057	8,044	7,925	8,089	8,955	10,001
Bankdebt/TA	0.45	0.43	0.42	0.41	0.41	0.41	0.40	0.38	0.38	0.38	0.38
Bankdebt/Debt	0.91	0.90	0.89	0.85	0.84	0.83	0.82	0.81	0.78	0.77	0.79
No.lend.banks	1.48	1.43	1.38	1.30	1.30	1.28	1.25	1.24	1.22	1.18	1.16
Deposits	386	492	552	577	616	576	471	320	302	362	508
Deposits/TA	0.03	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.02	0.02	0.03
Deposits/Debt	0.09	0.10	0.11	0.10	0.10	0.10	0.09	0.06	0.06	0.06	0.07
No.dep.banks	2.31	2.20	2.02	1.89	1.87	1.80	1.71	1.56	1.57	1.58	1.59

TABLE 5. Overview Norwegian bank events 1998-2007.
Sources: www.fnh.no, www.sparebankforeningen.no, annual reports and news articles.

Event	(Year)
<i>Domestic bank mergers</i>	
Postbanken and Den norske Bank	1999
Gjensidige Bank and Sparebanken NOR	1999
Birkenes Sparebank and Vegusdal Sparebank	1999
Sparebank 1 Hallingdal and Hemsedal Sparebank	1999
Tingvoll Sparebank and Gjemnes Sparebank	1999
Tingvoll Sparebank and Øksendal Sparebank	2001
Surnadal Sparebank and Stangvik Sparebank	2001
Finansbanken and Storebrand Bank	2002
Enebakk Sparebank and Lillestrøm Sparebank	2003
Sparebanken Sogn og Fjordane and Sparebanken Flora Bremanger	2003
Den norske Bank and Gjensidige NOR Sparebank	2004
Holla Sparebank and Lunde Sparebank	2004
Romsdal Fellesbank and Sparebank 1 Midt-Norge	2005
Sparebanken Rana and Helgeland Sparebank	2005
Ofoten Sparebank and Tjeldsund Sparebank	2006
Grong Sparebank and Verran Sparebank	2006
Ankenes Sparebank and Narvik Sparebank	2007
<i>Domestic acquisitions</i>	
Sparebank 1-alliance buys Vår Bank	2000
Den norske Bank buys Nordlandsbanken	2003
Sandnes Sparebank buys Acta Bank	2003
<i>Foreign-bank mergers and acquisitions</i>	
Svenska Handelsbanken buys Bergensbanken	1999
Danske Bank buys Fokus Bank	1999
Merita-Nordbanken buys Christiania Bank og Kreditkasse	2001
Santander buys Bankia Bank	2005
Islandsbanki buys Kredittbanken	2005
Islandsbanki buys BN Bank	2005
SEB buys Privatbanken	2005
SG and Santander buy Elcon Finans	2005

TABLE 6. Description of key variables

<i>Firm Characteristics</i>	
Size	$\log(\text{Total assets}_{it-1})$
Tangibles	$\frac{\text{Fixed assets}_{it-1}}{\text{Total assets}_{it-1}}$
Ebitda_assets	$\frac{\text{EBITDA}_{it+1}}{\text{Total assets}_{it}}$
Bkcyprob	Probability of bankruptcy ("Sebra" model)
Cash_assets	$\frac{\text{Cash}_{it-1}}{\text{Total assets}_{it-1}}$
<i>Firm-Bank Relationship Characteristics</i>	
Multibank	Dummy variable equal to one if firm has multiple bank lenders
Rel_hhi_utlaan	Herfindahl-Hirschman Index for the firm's bank loans
Savbank_borrower	Dummy variable equal to one if firm borrows from a savings bank
<i>Bank and Bank Loan Market Characteristics</i>	
Bankreg...hhi_ut..	Herfindahl-Hirschman Index for regional bank loan market
Induba...hhi_ut..	Herfindahl-Hirschman Index for industrial bank loan market
Topbanksize	Firm top bank lender's national bank loan market share
Topbankindu	Firm top bank lender's industry bank loan market share
Topbankregion	Firm top bank lender's regional bank loan market share

TABLE 7. Descriptive statistics

variable	N	mean	min	p25	p50	p75	max
LoanLagSize	875,822	0.246	0.000	0.000	0.020	0.377	2.921
Interest rate margin	418,796	0.040	-0.059	0.015	0.029	0.051	0.417
Normernext_top	986,652	0.035	0.000	0.000	0.000	0.000	1.000
Noracqnext_top	986,652	0.002	0.000	0.000	0.000	0.000	1.000
Foracqnext_top	986,652	0.013	0.000	0.000	0.000	0.000	1.000
Size	986,652	8.036	4.605	7.071	7.922	8.898	13.825
Tangibles	986,652	0.380	0.000	0.053	0.258	0.718	1.000
Ebitda_assets	875,822	0.150	-1.750	0.004	0.106	0.242	2.236
Bkcyprob	895,511	0.015	0.000	0.002	0.006	0.017	1.000
Cash_assets	986,652	0.208	0.000	0.025	0.110	0.317	1.000
Multibank	986,652	0.059	0.000	0.000	0.000	0.000	1.000
Rel_hhi_utlaan	515,136	0.969	0.180	1.000	1.000	1.000	1.000
Bankreg...hhi_ut..	979,032	0.217	0.117	0.160	0.185	0.244	1.000
Induba...hhi_ut..	984,491	0.153	0.055	0.123	0.141	0.189	0.342
Savbank_borrower	986,652	0.266	0.000	0.000	0.000	1.000	1.000
Topbanksize	986,652	0.049	0.000	0.000	0.000	0.041	0.439
Topbankindu	986,652	0.054	0.000	0.000	0.000	0.041	0.559
Topbankregion	986,652	0.106	0.000	0.000	0.001	0.192	1.000

TABLE 8. **Overall effect of bank M&As.** Estimates from fixed effects regressions. Dependent variables are *LoanLagSize*, which is the firm's total bank loans at time t as a share of the firm's total assets at time $t-1$, and *Interest rate margin*, which is the difference between estimated borrowing interest rate and the annual average NIBOR 3 month interbank rate. Explanatory variables are explained in Table (6). Control variables and firm fixed effects are not reported. The sample period is 1998-2007. Standard errors are clustered at the firm level.

	(1)	(2)	(3)	(4)
	LoanLagSize	LoanLagSize	Interest rate	Interest rate
Normernext_top $_{t-1}$	0.0001 (0.0020)	-0.0022 (0.0022)	0.0005 (0.0003)	0.0005 (0.0003)
Normernext_top $_{t-2}$		-0.0053* (0.0023)		-0.0005 (0.0003)
Noracqnext_top $_{t-1}$	0.0057 (0.0067)	0.0063 (0.0069)	-0.0045*** (0.0008)	-0.0047*** (0.0008)
Noracqnext_top $_{t-2}$		0.0046 (0.0071)		-0.0017* (0.0009)
Foracqnext_top $_{t-1}$	0.0241*** (0.0032)	0.0296*** (0.0034)	-0.0012* (0.0005)	-0.0015** (0.0005)
Foracqnext_top $_{t-2}$		0.0262*** (0.0032)		-0.0018*** (0.0005)
N	377213	377213	338740	338740
r^2	0.0739	0.0741	0.0422	0.0422

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 9. Overall effect of bank M&As for targets and acquirers. Estimates from fixed effects regressions. Dependent variables are *LoanLagSize*, which is the firm's total bank loans at time t as a share of the firm's total assets at time $t - 1$, and *Interest rate margin*, which is the difference between estimated borrowing interest rate and the annual average NIBOR 3 month interbank rate. *Normernext_top_acquirer1* is a dummy variable equal to one if a firm's largest bank lender at date $t - 1$ was involved in a domestic merger between dates $t - 1$ and t as an acquirer. *Normernext_top_target1* is equal to one if the firm's largest bank lender at date $t - 1$ was involved in a domestic merger between dates $t - 1$ and t as a target. The largest bank in a merger, as measured by total bank assets at date $t - 1$, is designated as the acquirer bank. Other explanatory variables are explained in Table (6). Control variables and firm fixed effects are not reported. The sample period is 1998-2007. Standard errors are clustered at the firm level.

	(1)	(2)	(3)	(4)
	LoanLagSize	LoanLagSize	Interest rate	Interest rate
Normernext_top_acquirer1 $_{t-1}$	0.0012 (0.0024)	-0.0009 (0.0026)	-0.0000 (0.0004)	-0.0001 (0.0004)
Normernext_top_acquirer1 $_{t-2}$		-0.0032 (0.0028)		-0.0010** (0.0004)
Normernext_top_target1 $_{t-1}$	-0.0013 (0.0028)	-0.0037 (0.0029)	0.0012* (0.0005)	0.0012* (0.0005)
Normernext_top_target1 $_{t-2}$		-0.0079** (0.0030)		0.0001 (0.0005)
Noracqnext_top $_{t-1}$	0.0058 (0.0067)	0.0064 (0.0069)	-0.0045*** (0.0008)	-0.0048*** (0.0008)
Noracqnext_top $_{t-2}$		0.0041 (0.0072)		-0.0015 (0.0009)
Foracqnext_top $_{t-1}$	0.0240*** (0.0032)	0.0296*** (0.0034)	-0.0011* (0.0005)	-0.0015** (0.0005)
Foracqnext_top $_{t-2}$		0.0260*** (0.0032)		-0.0018*** (0.0005)
<i>N</i>	377213	377213	338740	338740
<i>r</i> ²	0.0739	0.0741	0.0422	0.0423

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 10. **Regional Market Power.** Estimates from fixed effects regressions. Dependent variables are *LoanLagSize*, which is the firm's total bank loans at time t as a share of the firm's total assets at time $t-1$, and *Interest rate margin*, which is the difference between estimated borrowing interest rate and the annual average NIBOR 3 month interbank rate. *Normernext_top_reghhi* denotes cross-term of *Normernext_top* and *Bankreg...hhi.ut...*, and likewise for the other M&A variables. Other explanatory variables are explained in Table (6). Control variables and firm fixed effects are not reported. The sample period is 1998-2007. Standard errors are clustered at the firm level.

	(1)	(2)	(3)	(4)
	LoanLagSize	LoanLagSize	Interest rate	Interest rate
Normernext_top _{t-1}	0.0017 (0.0040)	0.0007 (0.0046)	0.0014* (0.0006)	0.0010 (0.0007)
Normernext_top _{t-2}		0.0021 (0.0044)		-0.0010 (0.0006)
Noracqnext_top _{t-1}	0.0043 (0.0155)	0.0107 (0.0164)	-0.0044* (0.0019)	-0.0048* (0.0021)
Noracqnext_top _{t-2}		0.0251 (0.0178)		-0.0007 (0.0020)
Foracqnext_top _{t-1}	0.0232** (0.0078)	0.0294*** (0.0083)	-0.0005 (0.0012)	-0.0006 (0.0013)
Foracqnext_top _{t-2}		0.0274*** (0.0077)		-0.0004 (0.0011)
Normernext_top_reghhi _{t-1}	-0.0072 (0.0157)	-0.0117 (0.0186)	-0.0039 (0.0023)	-0.0022 (0.0027)
Normernext_top_reghhi _{t-2}		-0.0333 (0.0170)		0.0023 (0.0023)
Noracqnext_top_reghhi _{t-1}	0.0060 (0.0470)	-0.0165 (0.0505)	-0.0003 (0.0065)	0.0003 (0.0072)
Noracqnext_top_reghhi _{t-2}		-0.0748 (0.0592)		-0.0028 (0.0072)
Foracqnext_top_reghhi _{t-1}	0.0037 (0.0322)	-0.0001 (0.0344)	-0.0030 (0.0050)	-0.0043 (0.0054)
Foracqnext_top_reghhi _{t-2}		-0.0083 (0.0316)		-0.0065 (0.0046)
<i>N</i>	376714	376714	338305	338305
<i>r</i> ²	0.0738	0.0741	0.0422	0.0423

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 11. **Effect on Lending Relationships.** Estimates from fixed effects regressions. Dependent variables are *LoanLagSize*, which is the firm's total bank loans at time t as a share of the firm's total assets at time $t - 1$, and *Interest rate margin*, which is the difference between estimated borrowing interest rate and the annual average NI-BOR 3 month interbank rate. *Normernext_top_opaq* denotes cross-term of *Normernext_top* and *Opaqueness*, and likewise for the other M&A variables. Other explanatory variables are explained in Table (6). Control variables and firm fixed effects are not reported. The sample period is 1998-2007. Standard errors are clustered at the firm level.

	(1)	(2)	(3)	(4)
	LoanLagSize	LoanLagSize	Interest rate	Interest rate
Normernext_top $_{t-1}$	0.0061 (0.0034)	0.0046 (0.0037)	-0.0007* (0.0003)	-0.0007 (0.0004)
Normernext_top $_{t-2}$		-0.0018 (0.0038)		-0.0005 (0.0004)
Noracqnext_top $_{t-1}$	0.0267* (0.0115)	0.0285* (0.0120)	-0.0037*** (0.0009)	-0.0039*** (0.0009)
Noracqnext_top $_{t-2}$		0.0084 (0.0126)		-0.0011 (0.0009)
Foracqnext_top $_{t-1}$	0.0338*** (0.0065)	0.0409*** (0.0069)	-0.0004 (0.0006)	-0.0006 (0.0007)
Foracqnext_top $_{t-2}$		0.0368*** (0.0060)		-0.0008 (0.0005)
Normernext_top_opaq $_{t-1}$	-0.0116* (0.0049)	-0.0132* (0.0054)	0.0024** (0.0008)	0.0024** (0.0009)
Normernext_top_opaq $_{t-2}$		-0.0068 (0.0055)		0.0001 (0.0008)
Noracqnext_top_opaq $_{t-1}$	-0.0449* (0.0184)	-0.0475* (0.0193)	-0.0017 (0.0024)	-0.0019 (0.0026)
Noracqnext_top_opaq $_{t-2}$		-0.0093 (0.0200)		-0.0013 (0.0027)
Foracqnext_top_opaq $_{t-1}$	-0.0185 (0.0098)	-0.0218* (0.0105)	-0.0014 (0.0015)	-0.0019 (0.0016)
Foracqnext_top_opaq $_{t-2}$		-0.0215* (0.0090)		-0.0021 (0.0014)
N	377213	377213	338740	338740
r^2	0.0739	0.0742	0.0422	0.0423

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 12. Overall effect of bank M&As on individual bank relationships. Estimates from fixed effects regressions of individual bank-firm relationships. Dependent variables are *LoanLagSize*, which is the firm's total bank loans at time t as a share of the firm's total assets at time $t - 1$, and *Interest rate margin*, which is the difference between estimated borrowing interest rate and the annual average NI-BOR 3 month interbank rate. *normernext* is a dummy variable equal to one at date $t - 1$ if the bank in the bank-firm relationship was involved in a domestic merger between the dates $t - 1$ and t , and likewise for the other M&A variables. Other explanatory variables are explained in Table (6). Control variables and firm fixed effects are not reported. The sample period is 1998-2007. Standard errors are clustered at the firm level.

	(1)	(2)	(3)	(4)
	LoanLagSize	LoanLagSize	Interest rate	Interest rate
<i>normernext</i> _{$t-1$}	-0.0047** (0.0018)	-0.0137*** (0.0019)	0.0006 (0.0003)	0.0009* (0.0004)
<i>noracqnext</i> _{$t-1$}	0.0518*** (0.0063)	0.0507*** (0.0066)	-0.0033*** (0.0008)	-0.0034*** (0.0009)
<i>foracqnext</i> _{$t-1$}	0.0312*** (0.0046)	0.0341*** (0.0047)	0.0003 (0.0009)	-0.0001 (0.0009)
<i>normernext</i> _{$t-2$}		-0.0347*** (0.0020)		0.0009** (0.0003)
<i>noracqnext</i> _{$t-2$}		0.0108 (0.0067)		-0.0009 (0.0010)
<i>foracqnext</i> _{$t-2$}		0.0201*** (0.0026)		-0.0024*** (0.0005)
<i>N</i>	413636	413636	333164	333164
<i>r</i> ²	0.0774	0.0785	0.0434	0.0435

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 13. **Effect on Individual Lending Relationships.** Estimates from fixed effects regressions of individual bank-firm relationships. Dependent variables are *LoanLagSize*, which is the firm's total bank loans at time t as a share of the firm's total assets at time $t - 1$, and *Interest rate margin*, which is the difference between estimated borrowing interest rate and the annual average NIBOR 3 month interbank rate. *Normernext_opaq* denotes cross-term of *normernext* and *Opaqueness*, and likewise for the other M&A variables. Other explanatory variables are explained in Table (6). Control variables and firm fixed effects are not reported. The sample period is 1998-2007. Standard errors are clustered at the firm level.

	(1)	(2)	(3)	(4)
	LoanLagSize	LoanLagSize	Interest rate	Interest rate
<i>normernext</i> _{$t-1$}	0.0004 (0.0032)	-0.0098** (0.0035)	-0.0014*** (0.0004)	-0.0011* (0.0004)
<i>noracqnext</i> _{$t-1$}	0.0643*** (0.0117)	0.0657*** (0.0124)	-0.0037*** (0.0011)	-0.0038** (0.0012)
<i>foracqnext</i> _{$t-1$}	0.0457*** (0.0094)	0.0501*** (0.0097)	0.0001 (0.0012)	0.0003 (0.0012)
<i>normernext_opaq</i> _{$t-1$}	-0.0098* (0.0045)	-0.0074 (0.0049)	0.0040*** (0.0009)	0.0039*** (0.0009)
<i>noracqnext_opaq</i> _{$t-1$}	-0.0263 (0.0185)	-0.0318 (0.0195)	0.0009 (0.0025)	0.0009 (0.0027)
<i>foracqnext_opaq</i> _{$t-1$}	-0.0279* (0.0141)	-0.0310* (0.0145)	0.0005 (0.0026)	-0.0009 (0.0027)
<i>normernext</i> _{$t-2$}		-0.0380*** (0.0035)		0.0010* (0.0004)
<i>noracqnext</i> _{$t-2$}		0.0243 (0.0124)		-0.0008 (0.0012)
<i>foracqnext</i> _{$t-2$}		0.0295*** (0.0052)		0.0005 (0.0006)
<i>normernext_opaq</i> _{$t-2$}		0.0065 (0.0049)		-0.0001 (0.0008)
<i>noracqnext_opaq</i> _{$t-2$}		-0.0297 (0.0198)		0.0001 (0.0030)
<i>foracqnext_opaq</i> _{$t-2$}		-0.0183* (0.0077)		-0.0058*** (0.0013)
<i>N</i>	413636	413636	333164	333164
<i>r</i> ²	0.0774	0.0786	0.0435	0.0437

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$