

Information Asymmetries, Cross-Product Banking Mergers, and the Effects on Corporate Borrowers

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October 2005

ABSTRACT

Commercial banks have radically expanded their underwriting capabilities by merging with investment banks. While corporations that both borrow from banks and access public markets may benefit from relationships with merged commercial-investment banks due to scope economies, they may be harmed if mergers increase banks' bargaining power. Using a hand-matched dataset of loans, borrowers, and lenders, this paper provides evidence that corporate borrowers benefit from these mergers. First, borrowers who also issue public securities, particularly unrated firms for whom informational economies of scope are likely to be substantial, are more likely to switch lenders to a merged commercial-investment bank when their existing lenders are pure commercial banks. This suggests that the mergers provide benefits to borrowers which exceed the costs of switching lenders. Second, a direct benefit is lower borrowing costs – commercial-investment banks charge loan yield spreads to borrowers who issue public securities that are 24 to 29 basis points lower than pure commercial banks. Loan yield spread discounts are large and significant when borrowers are unrated and start a new lending relationship.

* E-mail: sd2281@columbia.edu. Phone: 212-854-4151. I am very grateful to the FDIC Center for Financial Research for funding this research. I would like to thank Peter DeMarzo, Paul Pfleiderer, and Manju Puri, as well as Adam Ashcraft, Mark Carey, Astrid Dick, Mark Flannery, Gerald Hanweck, Thomas Hellmann, Laurie Hodrick, Hans Hvide, Jeremy Graveline, Steve Grenadier, Yael Hochberg, Wenyang Jiangli, Ron Kasznik, Michael Klausner, Paul Oyer, Daniel Paravisini, Leandro Saita, Ilya Strebulaev, Jeff Zwiebel and seminar participants at the Board of Governors, Washington D.C., Columbia University (GSB), the Federal Reserve Banks of Chicago and New York, MIT (Sloan), NYU (Stern), Northwestern University (Kellogg), Stanford University (GSB), SUNY – Stony Brook, UCLA (Anderson), University of Chicago (GSB), University of Maryland (Smith), University of Pennsylvania (Wharton), the 2004 FDIC Center for Financial Research Summer Workshop, the 2005 Federal Reserve Bank of Chicago Conference on Bank Structure & Competition, and the 2005 Financial Management Association Meetings for helpful comments and suggestions.

1 Introduction

During the late 1990s and early 2000s, the financial services industry in the United States experienced a consolidation wave. In addition to a large number of mergers between commercial banks, there were many cross-product mergers between commercial and investment banks (“CB-IB mergers”). These mergers followed the relaxation and repeal of the 1933 Glass-Steagall Act, which had prohibited commercial banks from underwriting public securities. The merging of commercial banks and investment banks represents a significant development in financial intermediation, as firms are now able to access a full range of financial products and services from a single financial institution.¹

Bank borrowers that also issue public securities may benefit from CB-IB mergers due to complementarities between lending and underwriting. Through lending, a bank gathers borrower-specific private information, and sharing of information across divisions may produce economies of scope that lower the costs of financial intermediation (see e.g. Benston 1990; Kanatas & Qi 2003; Drucker & Puri 2005b).² On the other hand, firms may be harmed if CB-IB mergers increase the bank’s market power. When borrowers issue public securities, the CB-IB’s access to private information may place outside underwriters at a strategic disadvantage, deterring competition (Rajan 1996, 2002).

Do firms benefit or are they harmed by mergers between commercial and investment banks? How important is private information in determining these effects? In this paper, I empirically examine these questions by studying the effects of CB-IB mergers on firms’ lending relationships and the pricing of loan contracts by using a unique data set of individual loan contracts that is carefully assembled and hand-matched from multiple databases. To determine whether firms benefit or are harmed by CB-IB mergers, the empirical analysis relies on the revealed preference of borrowers. Since switching lenders is costly, firms that gain from CB-IB mergers can be identified as those who switch to CB-IBs from pure commercial banks, all else

¹ Despite being able to offer investment banking services and products without merging with an investment bank, in general, commercial banks had limited success. Cadette (1996) attributes this to Glass-Steagall restrictions that were “crimping the ability of American commercial banking organizations to meet their customers’ needs.”

² Diamond (1984; 1991), Ramakrishnan and Thakor (1984), Fama (1985), Boyd and Prescott (1986), and many other authors highlight banks’ comparative advantage in producing information.

equal.³ Conversely, firms that switch from CB-IBs to pure commercial banks are likely to be harmed by CB-IB mergers. Further, I determine if these benefits or costs are observed through changes in borrowing costs. Importantly, since theory suggests that many of the costs and benefits of combining commercial and investment banking are due to the bank's ability to share private information between lending and underwriting, I assess whether CB-IB mergers have stronger effects on more informationally opaque firms.

The empirical evidence suggests that borrowers who also issue public securities benefit from CB-IB mergers, as they are more likely to start new lending relationships with CB-IBs when they only have relationships with pure commercial banks. Importantly, only informationally opaque, unrated borrowers that issue public securities are likely to switch to CB-IBs from pure commercial banks. This suggests that the benefits of CB-IB mergers are related to the CB-IB's ability to use private information in both lending and underwriting.

One direct benefit of borrowing from a commercial-investment bank is lower borrowing costs. In comparison to a similar loan from a pure commercial bank to a borrower that issues public securities, CB-IBs charge loan yield spreads that are 24 to 29 basis points lower. The yield spread discount is statistically significant and economically substantive, measuring more than \$430,000 for the average loan. Importantly, the yield spread discounts are not driven by observable differences between CB-IB loans and pure commercial bank loans, as I use propensity score matching techniques developed by Rosenbaum & Rubin (1983) and Heckman *et al.* (1997; 1998) to control for borrower and bank characteristics, the strength of firm-bank relationships, and loan contract terms.

Interestingly, the loan savings are concentrated among loans to unrated borrowers that also issue public securities, where the expected informational economies of scope are relatively large. Further, the analysis points to a specific source of scope economies. Since CB-IBs provide loan discounts only to their *new* customers that are likely to issue public securities, it appears that mergers between commercial banks and investment banks provide scope economies by allowing the bank to spread the fixed costs of establishing a relationship over multiple products.

³ See Klemperer (1995) for a review of the literature on switching costs. See Kim *et al.* (2003) for an in-depth analysis of switching costs in banking.

The fact that informationally opaque, unrated firms benefit from CB-IB mergers suggests that the gains are due to informational scope economies. This is particularly interesting given that CB-IBs are large banks, and the literature documents that large banks tend to rely on “hard,” verifiable information when extending loans (see e.g. Berger & Udell 1996; Cole *et al.* 1999; Berger *et al.* 2005).⁴ The results in this paper suggest that “soft,” private information is still collected and utilized even by the largest banks, yielding efficiencies.

Other findings reinforce the view that the positive effects of CB-IB mergers are due to the CB-IB’s ability to share information between lending and investment banking. First, when the bank is likely to have less private information, such as when the firm is rated, CB-IB mergers do not have a significant effect on the decision to switch lenders or on loan yield spreads. Second, CB-IB mergers do not impact loan pricing or the choice of lender for borrowers that do not issue public securities, and therefore, have little need for investment banking services. Third, the results are not driven by mergers between commercial banks.

This paper extends the growing literature on the effects of banking mergers on borrowers, a topic that is largely unexplored due to a lack of loan level data.⁵ The prior studies that examine firm-level effects focus on mergers between commercial banks, showing that borrowers of acquired banks are more likely to lose their lending relationships (Sapienza 2002; Degryse *et al.* 2005; Karceski *et al.* 2005) and that the impact on loan prices depends upon the degree of market overlap and the size of the merging banks (Sapienza 2002; Erel 2005).⁶ It is unknown whether cross-product banking mergers benefit or harm firms, as most researchers have instead emphasized the potential for diversification gains (see e.g. Boyd & Graham 1988; Boyd *et al.* 1993; Estrella 2001) or the effects of mergers between commercial banks and insurance companies on bank shareholder wealth (Cybo-Ottone & Murgia 2000; Carow 2001). This paper provides the first analysis of how firms are affected by cross-product banking mergers and shows that mergers between commercial banks and investment banks significantly benefit borrowers,

⁴ “Hard” information is verifiable, while soft information cannot be directly verified by anyone other than the agent who produces the information. See Petersen (2002) and Stein (2002) for more complete discussions of soft versus hard information.

⁵ Studies that use aggregated data focus on the ex-post performance of merged banks, wealth effects for bank shareholders, and the supply of credit to small businesses. See Berger *et al.* (1999) and Walter (2004) for excellent reviews of the literature and discussion of the causes and consequences of commercial bank consolidation.

⁶ Carow *et al.* (2004) and Karceski *et al.* (2005) use borrower stock returns to assess the firm-level effects of commercial bank mergers.

influencing lending relationships and producing lower borrowing costs. Another contribution is that I concentrate on relationships between banks and medium to large firms, which are generally ignored in studies of relationship banking.⁷ The findings in this paper suggest that a bank's private information is an important aspect of the firm-bank relationship and can influence loan prices, even for medium to large firms.

This study also adds to the literature on combining commercial banking with investment banking. Much of the empirical literature that examines when banks lend and underwrite investigates the effect of bank lending on the underwriting of public securities.⁸ These studies have generally found that borrowers are likely to select their commercial bank as public security underwriter (Bharath *et al.* 2005; Drucker & Puri 2005b; Ljungqvist *et al.* 2005; Yasuda 2005), receiving higher security prices (see e.g. Puri 1996; Gande *et al.* 1997; Schenone 2004) while paying lower underwriter fees (Roten & Mullineaux 2002; Narayanan *et al.* 2004; Drucker & Puri 2005b; Yasuda 2005). However, there is very little evidence that providing investment banking services influences commercial banks' core business of commercial lending. This paper fills this gap in the literature by showing that when commercial banks provide investment banking services, there are significant effects on lending relationships and loan pricing. In addition, regulators and academics have questioned the firm-level and competitive effects of relaxing and repealing the Glass-Steagall Act (see e.g. Rajan 1996; Santomero & Eckles 2000; Carow *et al.* 2005). This paper contributes to the regulatory debate on expanding bank powers, providing evidence that informationally opaque firms who both borrow and issue public securities may benefit from dealing with a financial institution that can provide a full array of financial products and services.

The remainder of this paper is organized as follows. Section 2 describes the data and sample selection process. Section 3 provides an analysis of the effects of CB-IB mergers on lending relationships. Effects of CB-IB mergers on loan pricing are assessed in Section 4. Section 5 concludes.

⁷ See Boot (2000) for a survey of the relationship banking literature.

⁸ See Drucker and Puri (2005a) for a detailed review of the literature on the interaction between commercial banks and capital markets.

2 Data and Sample Selection

This paper analyzes mergers between commercial banks and investment banks that occur between 1997 through 2002. The sample period is appropriate to this study for two reasons. First, many commercial banks acquired investment banks during this time period. As shown in Table 1, there are 17 mergers with the first occurring in January 1997 and the last in July 2001. Second, there were no significant mergers between U.S. commercial banks and investment banks before this time period, largely due to regulatory restrictions that were subsequently relaxed.⁹ I identify mergers between commercial banks and investment banks using SDC *Platinum*'s mergers and acquisitions database. To ensure that mergers are with viable investment banks, I only include mergers where the investment bank had underwritten at least one equity or bond offering during the three years prior to the merger, which can be determined by examining SDC *Platinum*'s new issues database.

Using five databases, I construct a unique data set of individual loan contracts that includes price and non-price loan terms, the identities of the borrower and lender and their financial characteristics, and detailed information on firm-bank relationships. All variables are defined in detail in Appendix A. Loan data is from LPC *DealScan* for the period January 1997 through December 2002. LPC *DealScan* collects its loan data from SEC filings, large loan syndicators, and a staff of reporters, and the majority of companies in the LPC database are medium to large, public firms. For each lending facility, LPC provides the identities of the borrower and lender, the borrower's industry through the standard industrial classification ("SIC") code, the contract start and maturity date, the notional value of the facility, the type and purpose of the lending facility, as well as price and some other non-price terms of each loan.

I identify whether the lender on the loan is a commercial-investment bank or a pure commercial bank by using the lender name provided by LPC and the list of mergers in Table 1.¹⁰

⁹ In late 1996 and early 1997, the Federal Reserve relaxed major provisions of the Glass-Steagall Act, substantially increasing the amount of revenue that commercial banks could earn from investment banking activities and removing firewalls between the commercial bank and its investment banking division. See Carow and Kane (2002) for a review of the relaxation of the Glass-Steagall Act and event study evidence.

¹⁰ While commercial banks did not need to merge with investment banks in order to underwrite securities, by 1996, CBs with internally created investment banks had only achieved a 2% market share by dollar volume in equity underwriting (Gande *et al.* 1999). In debt underwriting, only J.P. Morgan achieved a significant market share by 1996 (7.3% by dollar volume of non-financial non-convertible public debt) and no other commercial bank had more

It is important to note that the date of the loan will affect the classification of each lender. For example, Bank of America merged with Robertson Stephens on October 1, 1997. For each loan contract before October 1, 1997, Bank of America is a pure commercial bank, while after this date, Bank of America is a commercial-investment bank.

LPC does not provide borrower and lender financial characteristics that are likely to affect a firm's choice of bank and loan pricing. Since LPC does not provide a reliable identifier that can be used to merge the loan data with other sources, I supplement the loans with borrower financial data by hand matching the firms in LPC to Compustat Industrial Annual by using the borrower name. Using data from the loan year, I construct measures of firm size (logarithm of assets), profitability (return on assets), and leverage (debt-to-asset ratio), and I also collect the Standard and Poor's long-term credit rating of the borrower. All notional figures are deflated by the GDP implicit price deflator so that the values are in January 1997 dollars.

I create bank-specific variables using the FDIC Reports of Condition and Income ("Call Reports") and hand match the data to the loans by using the name of the lender. The reputation of the bank can be an important factor in lender selection, which I capture through the bank's market share of total domestic commercial and industrial ("C&I") loans as of the end of the year prior to loan. When a merger between commercial banks occurs, I use the combined market share of the banks for the remainder of the year. For example, Fleet Bank merged with BankBoston in September 1999. At the end of 1998, Fleet Bank had a loan market share of 3.4% and BankBoston's loan market share was 3.6%. For each loan made by the consolidated bank between the merger date and the end of 1999, I use a market share of 7.0%. I also proxy for differences in bank funding costs by measuring the lender's balance sheet liquidity and capital ratio because if borrowers face switching costs in changing lenders, then funding costs may be incorporated into loan pricing (Hubbard *et al.* 2002). Liquidity is defined as the bank's total cash and balances due from depository institutions divided by its total assets, and the capital ratio is defined as the bank's total equity capital divided by its total assets using values from the end of the year prior to the loan year. Again, these variables are adjusted for commercial bank mergers.

than 1.5% of the market share according to Securities Data Corporation. In the empirical tests, I treat J.P. Morgan as a CB-IB, but the results are economically and statistically similar if I treat it as a pure commercial bank.

Prior literature suggests that the strength of a firm's lending relationships can influence both the selection of lender and the pricing of loans. Theoretically, strong lending relationship may allow banks to exert monopoly power over borrowers and charge higher interest rates (Sharpe 1990; Rajan 1992). However, stronger relationships could result in a higher probability of selection and lower interest rates for the borrower if there are scale economies in information production and banks pass along these savings (see e.g. Boot & Thakor 1994; Petersen & Rajan 1994).¹¹ Since a bank is likely to acquire more private information and develop a stronger relationship over the course of a longer relationship, one common way to capture relationship strength is through the duration of the lending relationship, which I calculate for each loan using LPC loan data from January 1992 through December 2002. Further, a bank that has a local presence in the firm's market may be able to acquire more "soft" information about the firm and develop a stronger relationship (see e.g. Petersen & Rajan 2002), and the distance between the firm and lending bank has been shown to affect loan interest rates (Degryse & Ongena 2005). To measure geographic proximity, I use the FDIC Summary of Deposits and determine whether the lending bank has a branch in the same state as the headquarters of the borrowing firm. Finally, firms that have an existing relationship with an investment bank may be less likely to need to establish a relationship with a CB-IB and also may not be as likely to face a hold-up problem (Rajan 1992). To capture these potential effects, I use SDC *Platinum*'s new issues database to identify firms that have issued public debt or equity and used an underwriter other than the lending bank during the five years prior to the loan. When creating these relationship variables, I account for mergers by assuming that the surviving financial institution acquires all of target's prior lending or underwriting relationships.

I use a subset of the database in the empirical analysis. Since I wish to study industrial firms, I remove financial firms (companies with a one-digit SIC code of six). Also, I remove syndicated loans where there is more than one lead bank involved in the transaction.¹² Removing these loans ensures that I accurately capture the lender that sets the loan rate and interacts with the borrower. Further, this restricts the sample to relationship-type loans, as larger

¹¹ The empirical literature on loan pricing is mixed. For example, Angelini *et al.* (1998) and Degryse & van Cayseele (2000) find evidence consistent with banks charging higher rates to borrowers with strong relationships while Berger & Udell (1995) and Bharath *et al.* (2005) find stronger lending relationships result in lower borrowing costs.

¹² For syndicated loans, *DealScan* identifies lead banks via titles that include the words "arranger" and "agent," and less active members with titles that include the words "manager" and "participant."

syndicated loans can be viewed as transactional in nature (Boot & Thakor 2000).¹³ Finally, all mergers between commercial banks and investment banks involve the largest commercial banks. To ensure that the loans are from similar lenders, I include only those loans from the fifty largest U.S. commercial bank lenders of C&I loans as of the end of 1996, as identified using data from the Call Reports.¹⁴ Banks are ranked by consolidating the C&I loans of each of the individual commercial banks owned by the same banking organization, as indicated by the highest level of the organizational structure.

Table 2, Panel A presents summary statistics for the sample of 3,810 loans. Forty-nine percent of loans are made by commercial banks that have merged with investment banks before the loan agreement and nearly 40 percent of loans are to borrowers that issue public securities. Borrowers tend to be medium sized, with median assets of \$167.1 million. Lenders have high capital ratios that average more than eight percent and are very liquid, with the mean lender maintaining a cash-to-assets ratio of nearly 0.07. The mean loan contract is for \$69.5 million with a term length of 36 months, the vast majority of loans are credit lines (71%), and most loans are for general corporate purposes and working capital (41%) or for debt repayment and recapitalization (34%).

The statistics in Table 2, Panel B show that while commercial-investment banks tend to lend to larger borrowers, most of their borrowers are not rated (71%) and have headquarters in a state where the bank has branches (66%). These interesting facts suggest that for the majority of borrowers, commercial-investment banks will produce “soft,” private information that could be useful in resolving information asymmetries between firms and investors. This follows from there likely being less public information available on unrated borrowers relative to borrowers that have credit ratings and from empirical evidence which shows that firms who borrow from banks that are closer in distance are more likely to communicate in person with their lenders (Petersen & Rajan 2002). Further, the fact that nearly three-quarters of the loans are credit lines heightens the likelihood that banks acquire private, firm-specific information. This follows

¹³ One concern of leaving out syndicated loans that have more than one lead bank is that I may not pick up all of a firm’s relevant lending relationships. As a result, I repeat the tests, leaving out all of the *borrowers* that have a syndicated loan with more than one lead bank. The results are economically and statistically similar and left unreported.

¹⁴ These banks account for 73% of the commercial and industrial loan market at the end of 1996. By comparison, the next 50 banks account for only 8% of the market. All mergers between commercial banks and investment banks involve banks ranked in the top-50.

because credit lines require more extensive monitoring of the firm due to the bank offering to lend funds to the firm in the future at pre-specified terms, which can make it more likely for lines of credit to be drawn upon when the firm is performing poorly (Berger & Udell 1995). Overall, there are a number of observable differences between the sample of loans from CB-IB lenders and loans involving pure commercial bank lenders, indicating that controls for borrower characteristics, lender financials, and firm-bank relationships will need to be included in the models in order to isolate the effects of CB-IB mergers.

3 Switching Lenders

This section provides an examination of whether firms benefit from or are harmed by CB-IB mergers. Theoretically, firms that both borrow in the private debt markets and issue public securities may benefit from mergers between commercial banks and investment banks because the CB-IB can share information across divisions, which may create economies of scope and reduce the costs of financial intermediation (see e.g. Benston 1990). Further, some prior empirical evidence shows that firms receive higher public security prices when using their commercial-investment bank as underwriter (Puri 1996; Gande *et al.* 1997; Schenone 2004). Since the largest impact on security prices are for companies that are more informationally opaque, the effect likely arises because the CB-IB can use private information from lending relationships to reduce information asymmetries between firms and investors when underwriting securities.

On the other hand, firms may be harmed by the mergers. First, if bank borrowing and raising capital in public markets are funding substitutes, CB-IB mergers may directly diminish competition by reducing the number of financial intermediaries. Second, CB-IB mergers may create an adverse selection problem that increases the bank's market power. In essence, the private information a commercial bank acquires through lending allows the bank to determine the quality of their borrowers, so outside underwriters will be skeptical of CB-IB borrowers that approach them to place securities, a problem that does not exist when pure commercial bank borrowers seek to issue public securities (Rajan 1996). Finally, by maintaining a lending relationship, a CB-IB can anticipate a firm's future funding needs and prepare for a securities

issuance well in advance of other intermediaries. This strategic advantage over outside underwriters may diminish competition and harm the borrower (Rajan 2002).

Still, it is not entirely clear that CB-IB mergers will have major effects on firms. CB-IBs are large banks, which have been shown to primarily focus their lending business on medium to large borrowers, for which hard information exists (see e.g. Berger *et al.* 1995; Peek & Rosengren 1996; Strahan & Weston 1996).¹⁵ If information is primarily in the public domain, then there may be little or no benefits that arise from sharing information across divisions of the bank. Further, if private information is not important, then there are unlikely to be additional benefits or costs that arise from CB-IB mergers causing changes in the amount of information asymmetry.

To examine whether firms benefit or are harmed by CB-IB mergers, I rely on the revealed preference of borrowers. If firms that do not have existing lending relationships with CB-IBs are more likely to switch to a CB-IB, then this implies that the benefits of a CB-IB lending relationship outweigh switching costs. On the other hand, borrowers that are significantly harmed by CB-IB mergers will be more likely to switch lenders following acquisitions.

Two important data issues arise when estimating a borrower's decision to switch lenders. There are some instances when a lender provides multiple lending facilities to the borrower on the same day. Since these loans are presumably negotiated at the same time, I consider the set of loans to represent a single interaction between the firm and bank. Therefore, I use the "loan deal" as the unit of analysis, where a loan deal is defined as one or more loans to a borrower by the same lender on the same date. Also, I remove loans where the borrower's first lending relationship forms during the sample period. Unlike borrowers that have lending relationships prior to the merger period, these firms can choose an *initial* lender that can provide a full array of investment banking services. If borrowers anticipate future dealings with their bank, then decisions to stay or switch will be biased by the initial choice. This restriction leaves a sample of loans to firms that borrow from the top-50 banks during the five years prior to the merger period

¹⁵ Stein (2002) reasons that large banks focus on larger companies because the banks are better equipped to handle hard information rather than "soft" information that is needed to assess the quality of small businesses. Petersen (2002) argues that this occurs for efficiency reasons.

of January 1997 through December 2002 and also receive a subsequent loan from at least one of these banks during the merger period.

Table 3 provides summary statistics for the 1,213 loan deals. As in the full sample of loans, borrowers are medium sized. Banks are liquid and well capitalized, which is not surprising given that the banks in this sample are the largest commercial banks in the United States. Lending relationships, on average, are strong and long lasting, as banks and borrowers have an average lending relationship of 54.8 months as of the date of the loan, and borrowers select a prior lender in over 75 percent of loan deals.

3.1 Multinomial Logit Models

I use a multinomial logit model to examine borrowers' decision to either borrow again from its prior lenders or switch lenders. This model allows the borrower to choose from among multiple choices based on factors that are specific to the potential choice, the firm, its prior lenders, and the relationship between the firm and its prior lenders.¹⁶ Each borrower is allowed to choose between three alternatives: (i) stay with any of its prior lenders, (ii) switch to a commercial-investment bank that is not a prior lender, or (iii) switch to a pure commercial bank that is not a prior lender. The set of lenders that are pure commercial banks as opposed to commercial-investment banks varies over time, based on the mergers that are listed in Table 1. Estimation of the model yields two coefficients for each independent variable: one captures the effect of the variable on the probability of switching to a commercial-investment bank instead of staying with a prior lender, and the other coefficient reflects the effect of the variable on the likelihood of switching to a commercial bank instead of staying with a prior lender.

Of interest is whether borrowers who have relationships with CB-IBs are more or less likely to switch to a new lender. This can be ascertained through the coefficients on an independent variable that indicates borrowers who have a prior relationship with a commercial bank that has merged with an investment bank by the date of the loan. In the estimation of the likelihood of switching to a CB-IB, a negative coefficient on this variable suggests that a

¹⁶ Greene (2000) provides an excellent discussion of models for choices between multiple alternatives. A multinomial logit model provides the relative probabilities of each of the alternatives and can be thought of as jointly estimating a series of logit models for each pair of alternatives.

borrower is more likely to switch to a CB-IB when it *does not* have a prior lending relationship with a CB-IB. This would be consistent with the benefits of CB-IB lending relationships outweighing switching costs. Alternatively, positive coefficients suggest that borrowers are more likely to switch lenders after their commercial bank acquires an investment bank, consistent with borrowers being harmed by CB-IB mergers.

The model contains other variables that may affect a borrower's choice. Many of these variables have been identified to influence the duration of lending relationships (Ongena & Smith 2001) and / or affect a firm's decision to switch from single to multiple lending relationships (Farinha & Santos 2002). Since borrower attributes may affect the choice, the model includes the firm's size, profitability, and leverage, as well as variables that indicate if the borrower is investment-grade rated or junk rated. Also in the model are variables for the bank's liquidity, equity capital ratio, and the bank's reputation, as proxied by the share of C&I loans of the borrower's main prior lender.¹⁷ It is expected that higher reputation banks will be more successful at retaining customers. Additional variables capture the strength of lending relationships by indicating when the borrower and its main prior lender have a local lending relationship, the duration of the relationship, and a variable which indicates that the borrower has an active investment banking relationship with another financial institution. Industry fixed effects using the one-digit SIC code of the issuer are also included in the model. Finally, for loan deals in the later part of the sample, there are more commercial banks that have previously merged with investment banks, which makes it more likely for borrowers to choose commercial-investment banks. To account for this aspect of the sample, I include year dummy variables.¹⁸

I estimate two variations of the model – in the first model, I do not consider differences based on the information transparency of the firm; I relax this restriction in the second model by allowing for differences between rated and unrated firms. Unrated firms are likely to be comparatively unknown to outside investors, which could make a relationship with a CB-IB particularly valuable. However, if the mergers increase the bank's market power, then unrated

¹⁷ The borrower's main prior lender is the bank that lent the most dollars (deflated into first quarter, 1997 dollars) to the borrower between January 1992 and the loan date

¹⁸ As a robustness check, I replace the year indicators with a continuous variable that measures the extent of CB-IB merger activity as the sum of the loan market shares of CB-IBs at the end of the month prior to the loan deal. The variable is not included *with* the year indicators due to collinearity problems. As expected, estimation reveals that higher levels of CB-IB market share are associated with borrowers being more likely to switch to CB-IBs. Results are qualitatively similar and left unreported.

firms are more likely to suffer. Of course, CB-IB mergers are unlikely to affect firms that have little need for investment banking services. Therefore, I split the sample based on whether the borrower is an issuer of public securities, with the expectation that any effects should be found among firms that issue public securities. All models are estimated with clustered standard errors because observations for the same borrower may be correlated.

3.2 Results

Table 4 presents the results of estimating the multinomial logit models.¹⁹ The odd columns provide the effects of the variables on the probability of switching to a new CB-IB as opposed to borrowing again from a prior lender, while the even columns show the effects of the variables on switching to a pure commercial bank instead of choosing to borrow from a prior lender. In Panel A, I present the results of the model in which I do not allow for differences in the switching decisions of rated and unrated firms. As for the control variables, high reputation banks are more likely to keep their borrowers. As shown in the first column, for the sample of borrowers who issue public securities, all else equal, a one standard deviation (5.06 percent) increase in the prior lender's market share decreases the odds that a borrower starts a new lending relationship with a CB-IB by 1.3 times. Borrowers that have lending relationships with banks that have local branches are approximately 1.4 times less likely to switch to lenders, which is consistent with local banks having stronger relationships. Interestingly, results in the first column show that borrowers who both issue public securities and have an active investment banking relationship with another financial institution are 1.4 times less likely to start a new relationship with a CB-IB. Although this result is not statistically significant, it is economically important and is consistent with the idea that one of the reasons for a firm to switch its borrowing to a CB-IB is to establish both a lending and underwriting relationship.

As for the effect of CB-IB mergers on firm-bank relationships, significant effects are found in the sample of borrowers that issue public securities after receiving the loan. The results in the first column indicate that, holding all other variables constant, the odds of a borrower

¹⁹ An assumption underlying the multinomial logit model is the independence of irrelevant alternatives ("IIA"). This means that adding or deleting potential choices does not affect the odds among the remaining outcomes. Using formal tests of IIA developed by Hausman & McFadden (1984), in all models, I cannot reject the assumption of IIA.

switching to a CB-IB are three times greater when the borrower's lender is pure commercial bank relative to when the prior lender has already merged with an investment bank, a significant difference at the 5% level. The results in the second column indicate that the new lender's ability to provide investment banking services is important to the switching decision, as there are no significant effects of CB-IB mergers on the likelihood of switching to a pure commercial bank. Importantly, the results in the third and fourth columns show that CB-IB mergers do not affect the switching probabilities for borrowers that do not issue public securities after the loan. These results are consistent with the benefits of establishing a relationship with a CB-IB outweighing the costs of switching from a pure commercial bank when the borrower is likely to access the public capital markets.

In Panel B, I explore whether the amount of private information that the commercial bank is likely to gather in the lending process has an effect on switching probabilities. The results in the first column are consistent with only informationally opaque firms benefiting from the mergers between commercial banks and investment banks. The estimation shows that, among borrowers that issue public securities, unrated borrowers with prior CB-IB lending relationships have a 2.8 percent probability of establishing a new relationship with a CB-IB while an unrated borrower that does not have a prior lending relationship with a CB-IB switches 9.2 percent of the time. The effects are both statistically significant and economically meaningful. In contrast, CB-IB mergers do not affect the switching probabilities of the more informationally transparent, rated borrowers. In combination, these results are consistent with the view that the ability of a CB-IB to use private information in investment banking is critical to the overall benefits that firms receive from CB-IB mergers.

One potential issue with the results is that the current model only incorporates the past financial characteristics of the borrower, but when banks lend, they examine the firm's future prospects. Therefore, it may be the case that particular types of firms are switching lenders independent of the merging activity of their prior lenders, inducing an omitted variables bias. To account for this possibility, I replace the firm financial characteristics (size, profitability, and leverage) with their ex-post counterparts, calculated in the year after the loan. The results in Panel C, which are for the sample of loan deals where the borrower issues public securities, are similar to the estimations that are displayed in Panels A and B. This indicates that the results are not driven by omitting these ex-post financial variables.

Overall, the results suggest that borrowers, particularly more informationally opaque firms that are likely to issue public securities, benefit from CB-IB mergers. This is supported by results that show that among public securities issuers, unrated borrowers are significantly more likely to establish a new lending relationship with a CB-IB when they do not have a prior relationship with a CB-IB. By revealed preference, the benefits of establishing new relationships with CB-IBs outweigh switching costs. Since the benefits are concentrated among firms that both issue public securities and are more informationally opaque, it is likely that the positive effects arise from informational economies of scope.

3.3 Are Mergers Between Commercial Banks Driving Switching Behavior?

As a robustness check, I perform additional tests by identifying mergers between the fifty largest commercial banks (“CB-CB mergers”). It is possible that some of the previous results are driven by general consolidation among commercial banks because some of the commercial banks that are involved in CB-IB mergers also merge with other commercial banks during the sample period. While I control for the increases in size as well as changes in the liquidity and capital ratio of the bank by accounting for CB-CB mergers when constructing the bank-specific control variables, it is possible that CB-CB mergers have other effects that can influence the likelihood of switching. Also, studying the effects of CB-CB mergers provides a useful comparison with CB-IB mergers because the commercial bank does not gain another line of business through CB-CB mergers.

In order to address these issues, I examine if CB-CB mergers affect the probability that a borrower switches lenders. To proceed, I make a few changes to the model. First, I alter the dependent variable to be an indicator variable that equals one if the firm switches to any commercial bank that is not a prior lender. Also, I replace the variable that indicates the prior lender has merged with an investment bank with a similar variable that indicates the prior lender has merged with another top-50 commercial bank prior to the loan deal. I use this more parsimonious specification because I find little reason for a merger between commercial banks to have different influences on the likelihood that a borrower establishes a new lending relationship

with a CB-IB instead of a pure commercial bank.²⁰ The results of the probit estimations are found in Table 5, and in all cases, commercial bank mergers do not affect switching probabilities. These estimations support that the effects on firm-bank relationships that are identified in Section 3.2 are not simply due to general banking consolidation and likely due to the CB-IB's ability to use its private information from lending in investment banking.

4 The Pricing of Loan Contracts

In Section 3, I provide evidence that suggests borrowers who also issue more informationally sensitive securities benefit from CB-IB mergers. Now, I examine if one direct benefit of CB-IB mergers is lower loan yield spreads, which could arise if informational economies of scope produce lower costs and CB-IBs pass these savings along to firms.²¹ Loan discounts may be pronounced among firms that are starting new lending relationships with CB-IBs because mergers between commercial banks and investment banks increase the potential points of contact between the bank and firm, allowing the bank to spread the fixed costs of establishing a relationship over multiple products.

4.1 Propensity Score Matching

In order to determine the effect of mergers between commercial banks and investment banks on the pricing of loan contracts, I compare the loan yield spreads charged by commercial-investment banks with the spreads charged by pure commercial banks.²² Simply comparing the means of the two samples is likely to produce biased results because, as shown in Table 2, Panel B, there are many observable differences in factors that may influence loan pricing. One way to account for these differences is to match CB-IB loans and pure commercial bank loans based on

²⁰ In support, when I estimate the original model, a comparison of switching to a CB-IB with switching to a pure commercial bank reveals that the CB-CB merger variables are insignificantly different.

²¹ The yield spread is the rate that the borrower pays to the lender (inclusive of fees), quoted in basis points over LIBOR.

²² As in the loan deal sample, the date of the loan affects the classification of each lender, with banks that either never merge with an investment bank or have not *yet* merged with an investment bank by the date of the loan being classified as pure commercial banks.

many observables, but finding individual loans that have similar attributes on multiple dimensions is likely to be very difficult, if not impossible. To overcome this difficulty, I use propensity score matching techniques that were developed by Rosenbaum & Rubin (1983), and extended by Heckman & Robb (1986) and Heckman *et al.* (1997; 1998).²³ In effect, instead of matching directly on many observable characteristics, propensity score matching allows matches to be based on a one-dimensional propensity score, which is a function of borrower, lender, lending relationship, and loan characteristics. Pure commercial bank loans and CB-IB loans that are similar across many observable characteristics have similar propensity scores and are more likely to be matched. Importantly, the technique ensures that observed differences are not driving yield spread differences.

I use a probit model to compute propensity scores for each of the CB-IB loans and pure commercial bank loans. The dependent variable indicates loans that are from lenders that have merged with investment banks before the loan date, and the independent variables are dummy variables for the firm's credit rating and industry, the firm's size, leverage, and profitability, the lender's liquidity and capital ratio, an indicator for lending relationships where the lender and borrower are in the same state, the duration of the lending relationship, a variable that indicates that the borrower has an active investment banking relationship with another financial institution at the time of the loan, the notional size of the loan, the term length of the loan, indicators for the type of loan, indicators for the purpose of the loan, and year dummy variables.²⁴ I remove loans that have propensity scores that are outside of the common support of CB-IB loan and pure commercial bank loan propensity scores because using these outlier loans can substantially bias the results (Heckman *et al.* 1997).

Two classes of propensity score matching estimators are used to estimate the mean effect of the difference between CB-IB loan yield spreads and pure commercial bank yield spreads: (i) nearest neighbor matching; and, (ii) kernel-based matching. The nearest neighbor matching estimator chooses for each CB-IB loan, the 10 pure commercial bank loans with closest propensity scores to the CB-IB loan propensity score and computes the arithmetic average of the

²³ Appendix B provides details on propensity score matching.

²⁴ Notional size, term length, and type of loan are determined at the same time as the loan yield spread, which may bias the results. As a robustness check, I exclude these variables when computing the propensity scores, and the results are similar and not reported. Also, the firm characteristics are measured during the year of the loan, which has the benefit of timeliness but the potential problem that receiving the loan may alter the financial characteristics. The results are robust to using firm characteristics that are measured in the year prior to the loan year.

yield spreads of these 10 pure commercial bank loans. The kernel estimator constructs matches for each CB-IB loan by using weighted averages of yield spreads of multiple pure commercial bank loans, with more weight on pure commercial bank loans that are close in propensity score to the CB-IB loan and less or zero weight on more distant observations. I use the Epanechnikov kernel, which limits the potential set of pure commercial bank loan matches to ones with a propensity score that falls within a bandwidth of 0.01 of the CB-IB loan's propensity score. As a robustness check, I also try different bandwidths and obtain similar results. Both methods measure the average difference between CB-IB loan yield spreads and their matched pure commercial bank counterpart.

Since CB-IB mergers are unlikely to affect firms that do not need underwriting services, I split the loan sample based on whether the borrower is an issuer of public securities. I estimate a model where I do not allow for differences based on the information transparency of the borrower and then relax this restriction by splitting the loan sample to allow for a comparison of unrated CB-IB loans with matched, unrated loans from pure commercial banks and to enable CB-IB loans to rated borrowers to be matched with pure commercial bank loans to similar, rated borrowers. If CB-IBs charge lower yield spreads than pure commercial banks to the more informationally opaque, unrated borrowers that issue public securities, then this would be consistent with the benefits seen in Section 3 being partially due to informational economies of scope. Further, to explore the possibility that CB-IBs take advantage of their ability to spread relationship startup costs across multiple products by charging lower loan yield spreads to new customers, I split the sample into two subsamples based on whether the borrower has received a prior loan from the lender. Standard errors are computed by bootstrapping with fifty replications.

4.2 Results

The results of estimating yield spread differences are presented in Table 6. Each yield spread differential represents the discount (if negative) or premium (if positive) that a borrower pays when borrowing from a commercial-investment bank. Three results in Panel A of Table 6 support the view that CB-IB mergers benefit borrowers when there are likely to be cost savings

from the CB-IB sharing information between lending and investment banking. First, the yield spread differentials that are displayed in the first and third columns indicate that borrowers who also issue public securities are charged lower loan yield spreads by CB-IBs, with an average discount of between 24.2 and 29.4 basis points that is significant at the two percent level. For the average loan in the sample, which is a \$70 million dollar, 3-year loan, a borrower earns a present value savings of between \$430,000 and \$522,000 using a ten percent discount rate. Second, the lower yield spreads charged by CB-IBs are restricted to the sample of firms that issue public securities; the yield spread differentials in the second and fourth column show that non-issuers do not receive discounts. Third, yield spread discounts are only found among the more informationally opaque unrated borrowers, where economies of scope are likely to be large. Unrated borrowers that also issue public securities receive loan discounts from CB-IBs of between 18.9 and 26.8 basis points relative to similar, matched loans from pure commercial banks, while rated borrowers do not receive significant discounts.

The estimations that are displayed in Table 6, Panel B indicate that yield spread discounts are provided to new customers of the CB-IB but not to borrowers that receive follow-up loans from a prior lender. Among loans to borrowers that also issue public securities, CB-IB loans have yield spreads that are between 25.8 and 29.6 basis points lower than similar, matched loans from pure commercial banks when the borrower and lender do not have a prior lending relationship. The lower yield spreads charged by CB-IBs to their new borrowers are concentrated among unrated borrowers, with present value savings ranging between \$486,000 and \$620,000 using a ten percent discount rate. Further, no discounts are provided to new borrowers of commercial-investment banks when the borrower does not issue public securities. In combination, these results are consistent with the lower loan yield spreads resulting from the CB-IBs ability to spread relationship startup costs across multiple products.

Since banks set loan yield spreads based on estimates of future performance and risk, one possible explanation for the lower yield spreads is that the firms who start new relationships with CB-IBs are of higher quality than borrowers that start new relationships with pure commercial banks. However, the results from the multinomial logit model in Table 4, Panel C indicate the opposite is true; the coefficients associated with future profitability indicate that borrowers that switch to commercial-investment banks are of *worse* quality in comparison with borrowers that

switch to pure commercial banks.²⁵ Still, to formally account for the possibility that future performance is driving the results, I replace the firm financial characteristics (size, profitability, and leverage) with their ex-post counterparts, calculated in the year after the loan year. The results in Table 6, Panel C indicate that ex-post performance and risk are not responsible for the lower yield spreads; similar to the results in Panel B, new customers of CB-IB lenders receive loan yield spreads that are discounted, on average, by between 19.8 to 28.7 basis points relative to matched first-time loan yield spreads from pure commercial banks involving borrowers that also issue public securities.

Another alternative explanation is that the lower yield spreads are caused by commercial bank mergers. Since many of the commercial-investment banks also merge with other commercial banks, the lower yield spreads may be due to banks becoming larger and more efficient. To examine this possibility, I modify the propensity score matching techniques to compare loans from commercial banks that have merged with other commercial banks with similar loans where the lender has not merged with another commercial bank by the loan date. The results in Table 6, Panel D show that commercial bank mergers do not significantly affect loan yield spreads, indicating that the lower yield spreads charged by CB-IBs are not due to general banking consolidation. Also, since CB-CB mergers do not expand the scope of bank operations, the results support the view that the lower yield spreads charged by CB-IBs are due to economies of scope.

The analysis in Section 3 suggests that more informationally opaque borrowers that are likely to also issue public securities benefit from CB-IB mergers. The results of this section indicate that one such benefit is lower loan yield spreads charged by CB-IBs relative to pure commercial banks, which is consistent with cost savings resulting from informational scope economies. Interestingly, the discounted loan yield spreads from commercial-investment banks are provided only on loans that establish new lending relationships with borrowers that also issue public securities, which suggests that a major source of scope economies is the ability to spread the fixed costs of establishing relationships across multiple products. In support of the lower yield spreads being driven by the CB-IB's ability to re-use information in lending and investment banking, robustness checks show that the lower yield spreads charged by commercial-investment

²⁵ While the ex-post financial variables are statistically insignificant, borrowers with higher future profitability are 1.6 times more likely to switch to a pure commercial bank rather than switch to a CB-IB.

banks are not due to strong ex-post performance of borrowers, decreases in borrower risk, or mergers between commercial banks.

5 Conclusion

Following the relaxation and repeal of the 1933 Glass-Steagall Act, commercial banks merged with investment banks, allowing banks to both lend and underwrite public securities. Through these cross-product mergers, the commercial bank acquires the capability to use the private information from its lending relationships in investment banking. This may create efficiencies that benefit firms who both borrow privately and issue public securities, but these mergers may hurt firms by increasing the banks' market power.

To examine the effects of CB-IB mergers on borrowers, I use a unique, hand-matched dataset of individual loan contracts that includes loan, borrower, lender, and lending relationship characteristics. The empirical findings indicate that these mergers are beneficial to borrowers when there is substantial potential for informational economies of scope from combining lending and investment banking. This is supported by the decisions of informationally opaque unrated borrowers that issue public securities to switch from pure commercial banks to CB-IB lenders. Since switching lenders is costly, by revealed preference, these borrowers benefit from CB-IB lending relationships. One direct benefit for these borrowers is CB-IB lenders charge lower loan yield spreads; unrated borrowers that issue public securities receive, on average, a present value savings of more than \$400,000 on loans from merged commercial-investment banks relative to similar loans from pure commercial banks.

The fact that only new borrowers receive loan discounts suggests that a major source of cost savings results from the ability of the CB-IB to spread the fixed costs of establishing a relationship over multiple products. If the benefits of other cross-product banking mergers are largely due to reducing relationship initiation costs, then this may provide a guide to understanding which types of cross-product banking mergers are likely to be most beneficial to firms. This raises an interesting implication for regulating the scope of bank activities.

Appendix A

Detailed Descriptions of the Variables

Switching Lenders

- SWITCHLEND: In the multinomial logit model, the variable indicates the borrower's choice from three alternatives: (i) "Prior Lender," which is any bank that has provided a loan to the firm between January 1992 and the loan date; (ii) "New CB-IB," which is a commercial bank that has merged with an investment bank and has not provided a loan to the firm between January 1992 and the loan date; and, (iii) "New CB," which is a commercial bank that has not merged with an investment bank and has not provided a loan to the firm between January 1992 and the loan date. In the probit model, an indicator variable that equals one if the firm selects any commercial bank that has not provided a loan to the firm between January 1992 and the loan date.
- PRIORCBIBREL: An indicator variable that equals one if the borrower has a relationship with a commercial bank that has merged with an investment bank prior to the loan deal.
- ISSUEPUB: An indicator that equals one if the borrower issues public debt or public equity between January 1997 and June 2004.
- LNASSETS: The logarithm of ASSETS, the total assets during the loan year, measured in first quarter, 1997 dollars.
- ROA: The return on assets, calculated as the ratio of net income to total assets during the loan year, measured in first quarter, 1997 dollars.
- LEVERAGE: The book debt to total assets during the loan year, measured in first quarter, 1997 dollars.
- IGRADE: A dummy variable that equals one if the firm has a Standard and Poor's long-term debt rating of AAA, AA, A, or BBB at the time of the loan.
- JUNK: A dummy variable that equals one if the firm has a Standard and Poor's long-term debt rating of BB, B, CCC, CC, or C at the time of the loan.
- NR: A dummy variable that equals one if the firm does not have a Standard and Poor's long-term debt rating at the time of the loan.
- RATED: A dummy variable that equals one if the firm has a Standard and Poor's long-term debt rating at the time of the loan.
- LOANMKTSHR: The market share of the borrower's prior lender's total domestic C&I loans as of the end of the year prior to the year of the loan, adjusted for mergers that take place during the year of, but prior to, the loan, expressed as decimal. If the firm has multiple lending relationships, then the firm's prior lender from whom it has borrowed the most dollars (deflated into first quarter, 1997 dollars) between January 1992 and the loan date is used for identification.
- LIQUIDITY: The borrower's prior lender's total cash and balances due from depository institutions divided by total assets as of the end of the year prior to the year of the loan, adjusted for mergers that take place during the year of, but prior to, the loan, expressed as decimal. If the firm has multiple lending relationships, then the firm's prior lender from whom it has borrowed the most dollars (deflated into first quarter, 1997 dollars) between January 1992 and the loan date is used for identification.
- CAPITALRATIO: The borrower's prior lender's total equity capital divided by total assets as of the end of the year prior to the year of the loan, adjusted for mergers that take place during the year of, but prior to, the loan, expressed as decimal. If the firm has multiple lending relationships, then the firm's prior lender from whom it has borrowed the most dollars (deflated into first quarter, 1997 dollars) between January 1992 and the loan date is used for identification.
- LOCAL: An indicator that equals one if the firm's prior lender has a branch in the same state of the borrower's headquarters at the time of the loan deal. If the firm has multiple lending relationships, then the firm's prior lender from whom it has borrowed the most dollars (deflated into first quarter, 1997 dollars) between January 1992 and the loan date is used for identification.
- LNDURATION: The logarithm of 1+DURATION, the number of months between the first loan provided by the firm's prior lender and the loan date. If the firm has multiple lending relationships, then the firm's prior lender from whom it has borrowed the most dollars between January 1992 and the loan date is used for identification.
- OTHERIBREL: An indicator variable that equals one if the borrower has issued public debt or public equity during the five years prior to the loan deal and used an underwriter other than its prior lenders as lead manager.
- IND: Dummy variables that equal one if the issuer is in the corresponding one-digit SIC group
- YR: Dummy variables that correspond to the year of the loan deal.
- CBMERGE: An indicator variable that equals one if the borrower has a relationship with a commercial bank that has merged with another commercial bank (ranked in the top-50 of C&I lenders as of the end of 1996) prior to the loan deal.

LNASSETS_{YR+1}: The logarithm of total assets during the year after the loan year, measured in first quarter, 1997 dollars.
ROAYR+1: The return on assets, calculated as the ratio of net income to total assets during the year after the loan year, measured in first quarter, 1997 dollars.
LEVERAGE_{YR+1}: The book debt to total assets during the year after the loan year, measured in first quarter, 1997 dollars.

The Pricing of Loan Contracts

YSPREAD: The yield spread of the loan. This is the *DealScan* item “all-in spread drawn,” which is the coupon spread over the London Interbank Offer Rate (LIBOR) plus the annual fee plus the up-front fee (which is divided by the maturity of the loan).

IBMERGE: An indicator variable that equals one at any date after the lending bank merges with an investment bank.

LNASSETS: The logarithm of ASSETS, the total assets during the loan year, measured in first quarter, 1997 dollars.

ROA: The return on assets, calculated as the ratio of net income to total assets during the loan year, measured in first quarter, 1997 dollars.

LEVERAGE: The book debt to total assets during the loan year, measured in first quarter, 1997 dollars.

RATING: Dummy variables that indicate the firm’s Standard and Poor’s long term debt rating at the time of the loan. Individual dummies are created for AAA, AA, A, BBB, BB, B, CCC, and C. Unrated loans are indicated by the variable NR.

LOANMKTSHR: The lender’s market share of total domestic C&I loans from commercial banks in the Federal Reserve Call Reports as of the end of the year prior to the year of the loan, adjusted for mergers that take place during the year of, but prior to, the loan, expressed as decimal.

LIQUIDITY: The lender’s total cash and balances due from depository institutions divided by total assets as of the end of the year prior to the year of the loan, adjusted for mergers that take place during the year of, but prior to, the loan, expressed as decimal.

CAPITALRATIO: The lender’s total equity capital divided by total assets as of the end of the year prior to the year of the loan, adjusted for mergers that take place during the year of, but prior to, the loan, expressed as decimal.

LOCAL: An indicator that equals one if the lender has a branch in the same state of the borrower’s headquarters at the time of the loan.

LNDURATION: The logarithm of 1+DURATION, the number of months between the first loan provided by the lender to the borrower and the loan date.

OTHERIBREL: An indicator variable that equals one if the borrower has issued public debt or public equity during the five years prior to the loan deal and used an underwriter other than the lender as lead manager.

LNLENGTH: The logarithm of LENGTH, the term length of the loan, where the term length is the number of months between the facility active date and the facility maturity date.

LNFACTSIZE: The logarithm of FACTSIZE, the notional size of the lending facility. The notional size is measured in first quarter, 1997 dollars.

LOANTYPE: Dummy variables that correspond to the type of lending facility. The dummy variables indicate if the facility is a term loan, 364-day facility, revolving line of credit, or other type.

LOANPURPOSE: Dummy variables that correspond to the purpose of the loan. The purposes are for acquisition, recapitalization (including debt repayments and consolidations), LBO, general (including working capital), miscellaneous (project finance, real estate, securities purchases, stock buybacks, spinoffs and trade finance), or other (including commercial paper backups, credit enhancements, DIP, and ESOPs). Grouping into these six categories is based on Hubbard *et al.* (2002).

IND: Dummy variables that equal one if the issuer is in the corresponding one-digit SIC group

YR: Dummy variables that correspond to the year of issuance.

ISSUEPUB: An indicator that equals one if the borrower issues public debt or public equity between January 1997 and June 2004.

CBMERGE: An indicator variable that is one at any date after the lender merges with another commercial bank, where both commercial banks are ranked in the top-50 commercial bank C&I lenders as of the end of 1996.

LNASSETS_{YR+1}: The logarithm of total assets during the year after the loan year, measured in first quarter, 1997 dollars.
ROAYR+1: The return on assets, calculated as the ratio of net income to total assets during the year after the loan year, measured in first quarter, 1997 dollars.
LEVERAGE_{YR+1}: The book debt to total assets during the year after the loan year, measured in first quarter, 1997 dollars.

Appendix B

Propensity Score Matching

Let $D=1$ for CB-IB loans and $D=0$ for pure commercial bank loans. Theoretically, the i th CB-IB loan has its observed CB-IB yield spread Y_{1i} and another yield spread Y_{0i} that would result if it were a pure commercial bank loan. To determine the average effect of CB-IB mergers on yield spreads, one would calculate the mean difference between Y_{1i} and Y_{0i} for all CB-IB loans $E(Y_1 - Y_0 | D=1)$. However, since Y_{0i} is unobservable, there is a missing data problem. While $E(Y_1 | D=1)$ can be identified from data on CB-IB loans, the unobservable counterfactual mean $E(Y_0 | D=1)$ can be approximated by the observable mean of pure commercial bank loan yield spreads $E(Y_0 | D=0)$, resulting in a bias, $B = E(Y_0 | D=1) - E(Y_0 | D=0)$. Intuitively, this bias can be problematic if Y_0 for the CB-IB loans and pure commercial bank loans differ systematically. If so, in observing only Y_0 for the pure commercial bank loans, we would not correctly estimate Y_0 for the CB-IB loans.

To address this problem, following Heckman and Robb (1986), assume that all relevant differences between CB-IB loans and pure commercial bank loans are captured by their observable characteristics X , and let $(Y_0, Y_1) \perp D | X$ denote the statistical independence of (Y_0, Y_1) and D conditional on X . Intuitively, this assumes that, conditioning on observable covariates, the assignment to either being a CB-IB loan or a pure commercial loan is taken as random and that unobservables do not play a role in assignment. Therefore, comparing the loan yield spreads of CB-IB loans and pure commercial bank loans with the same observable characteristics is like comparing the difference between the observable yield spread Y_{1i} and the unobservable Y_{0i} for CB-IB loans.

A major drawback of this solution is that one needs to match on many dimensions to substantially reduce the bias. Propensity score matching removes this limitation. Rosenbaum and Rubin (1983) establish that when $(Y_0, Y_1) \perp D | X$ and $0 < P(D=1 | X) < 1$ (which are referred to as the strong ignorability conditions), then $(Y_0, Y_1) \perp D | P(D=1 | X)$. This result allows matching based on the one-dimensional $P(D=1 | X)$ alone instead of the higher dimension X . $P(D=1 | X)$ is commonly referred to as the propensity score because it measures the propensity, or probability, that a given loan with characteristics X is a CB-IB loan.

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Table 1
List of Commercial Bank – Investment Bank Mergers, 1997 through 2002

This table presents a list of U.S. commercial banks that merge with investment banks and the month and year of merger. This list only includes mergers where the commercial banks were ranked in the top-50 of domestic commercial and industrial lending as of December 1996 and the investment bank had underwritten at least one equity or bond offering during the three years prior to the merger.

Commercial Bank	Investment Bank	Merger Date
LaSalle Bank	Chicago Corp.	January 1997
Bankers Trust	Alex Brown & Sons	September 1997
Bank of America	Robertson Stephens	October 1997
NationsBank	Montgomery Securities	October 1997
First Union	Wheat, First, Butcher & Singer	November 1997
SunTrust Bank	Equitable Securities	January 1998
US Bancorp	Piper Jaffray	May 1998
Fifth Third Bancorp	Ohio Co	June 1998
BankBoston	Robertson Stephens	September 1998
KeyCorp	McDonald Investments	September 1998
Citigroup	Salomon Smith Barney	October 1998
BB&T Corp	Scott & Stringfellow	November 1998
Wachovia Bank	Interstate - Johnson Lane	January 1999
First Union	Everen Securities	October 1999
Chase Manhattan Bank	Hambrecht & Quist	December 1999
Wells Fargo	Van Kasper & Co	November 2000
SunTrust Bank	Robinson Humphrey	July 2001

Table 2
Loan Sample Summary Statistics

This table provides summary statistics for the sample of 3,810 loan facilities. Borrowers are in COMPUSTAT and lenders are U.S. commercial banks that are ranked in the top-50 by commercial and industrial loan volume at the end of 1996. The time period is January 1997 through December 2002. All variables are explained in detail in Appendix A, under the heading “The Pricing of Loan Contracts.” Panel A summarizes the sample. Panel B summarizes differences between loan facilities based on whether or not the lender has merged with an investment bank by the date of the loan facility. A bank that has merged with an investment bank before the start of the loan facility (*IBMERGE=1*) is a commercial-investment bank (CB-IB) while a bank that has not merged with an investment bank before the start of the loan facility (*IBMERGE = 0*) is a commercial bank (CB). ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A: Summary Statistics			
Variable	Mean / Percentage	Std. Dev	Median
<i>Firm</i>			
ASSETS (\$ mil)	1310.26	7014.77	167.12
LNASSETS	19.11	1.68	18.93
ROA (%)	2.17	10.26	3.05
LEVERAGE (%)	57.14	25.09	56.62
ISSUEPUB (%)	38.69		
IGRADE (%)	10.05		
JUNK (%)	12.76		
NR (%)	77.19		
<i>Bank</i>			
IBMERGE (%)	49.24		
LOANMKTSHR (%)	6.68	5.10	5.20
LIQUIDITY (%)	6.74	2.48	6.40
CAPITALRATIO (%)	8.27	1.51	8.14
<i>Firm-Bank Relationship</i>			
LOCAL (%)	69.40		
DURATION (months)	17.29	25.75	0.00
LNDURATION	1.54	1.78	0.00
OTHERIBREL (%)	40.60		
<i>Loan Contract</i>			
LENGTH (months)	36.01	23.55	36.00
LNLENGTH	3.33	0.77	3.58
FACSIZE (\$ mil)	69.53	147.53	26.27
LNFACSIZE	17.00	1.55	17.08
<i>Type of Loan</i>			
Credit Line (%)	71.33		
Term Loan (%)	24.31		
Other Loan (%)	4.36		
<i>Purpose of Loan</i>			
Acquisition (%)	14.78		
General (%)	41.02		
LBO (%)	1.05		
Recapitalization (%)	33.52		
Miscellaneous (%)	2.70		
Other (%)	6.93		

(continued)

Table 2 (continued)

Panel B: Commercial-Investment Bank versus Commercial Bank Loan Facilities				
Variable	CB-IB Lender Mean / Percent	CB Lender Mean / Percent	Z-ratio	Wilcoxon test p-value
<i>Firm</i>				
ASSETS (\$ mil)	1858.15	778.79	4.70 ***	0.0000 ***
ROA (%)	2.15	2.19	-0.11	0.2819
LEVERAGE (%)	58.36	55.96	2.96 ***	0.0014 ***
ISSUEPUB (%)	39.02	38.37	0.41	
NR (%)	71.32	82.89	-8.50 ***	
<i>Bank</i>				
LOANMKTSHR (%)	9.02	4.41	31.15 ***	
LIQUIDITY (%)	5.74	7.71	-26.81 ***	
CAPITALRATIO (%)	8.51	8.03	9.82 ***	
<i>Firm-Bank Relationship</i>				
LOCAL (%)	66.36	72.34	-4.00 ***	
DURATION (months)	19.84	14.82	6.02 ***	0.0000 ***
OTHERIBREL (%)	38.22	42.92	-2.95 ***	
<i>Loan Contract</i>				
LENGTH (months)	34.86	37.07	-2.83 ***	0.0018 ***
FACSIZE (\$ mil)	77.38	61.93	3.25 ***	0.0000 ***
Number of Loan Facilities	1876	1934		

**Table 3
Loan Deal Summary Statistics**

This table provides summary statistics for the sample of 1,213 loan deals with “existing borrowers,” which are borrowers who are in COMPUSTAT and have a loan from at least one top-50 ranked bank both before and after January 1997. A loan deal is one or more loans to a borrower by the same lender on the same facility active date. The time period is January 1997 through December 2002. All variables are explained in detail in Appendix A, under the heading, “Switching Lenders.”

Variable	Mean / Percentage	Std. Dev	Median
<i>Firm</i>			
ASSETS (\$ mil)	1460.87	5711.35	271.57
LNASSETS	19.53	1.60	19.42
ROA (%)	2.54	1.13	3.29
LEVERAGE (%)	57.84	23.94	57.34
ISSUEPUB (%)	40.07		
IGRADE (%)	13.52		
JUNK (%)	17.48		
NR (%)	69.00		
<i>Bank</i>			
LOANMKTSHR (%)	6.57	4.88	5.72
LIQUIDITY (%)	6.87	2.46	6.49
CAPITALRATIO (%)	8.12	1.69	8.01
<i>Firm-Bank Relationship</i>			
SWITCHELND (%)	24.81		
PRIORCBIBREL (%)	49.22		
LOCAL (%)	67.85		
DURATION (months)	54.79	31.27	51.37
LNDURATION	1.59	0.51	1.65
OTHERIBREL (%)	47.90		

Table 4
Probability of Switching Lenders
Commercial Bank-Investment Bank Mergers

This table presents the results of a multinomial logit model, using the 1,213 loan deals from 1997 through 2002 where the borrower has an existing lending relationship at the time of the loan deal with a commercial bank ranked in the top-50 by total domestic commercial & industrial (C&I) loans (ranked as of the end of 1996). The dependent variable is *SWITCHLEND*, which indicates the borrower's choice from three alternatives: (i) "Prior Lender," which is any bank that has provided a loan to the firm between January 1992 and the loan date; (ii) "New CB-IB," which is a commercial bank that has merged with an investment bank and has not provided a loan to the firm between January 1992 and the loan date; and, (iii) "New CB," which is a commercial bank that has not merged with an investment bank and has not provided a loan to the firm between January 1992 and the loan date. The key independent variable is *PRIORCBIBREL*, an indicator variable that equals one if the borrower has a relationship with a commercial bank that has merged with an investment bank prior to the loan deal. Other independent variables are the logarithm of the borrower's assets (*LNASSETS*); the borrower's return on assets (*ROA*); the borrower's debt-to-asset ratio (*LEVERAGE*); indicators that equal one if the borrower is investment-grade rated (*IGRADE*) or junk rated (*JUNK*); the market share of commercial & industrial loans (*LOANMKTSHR*), the cash-to-assets ratio (*LIQUIDITY*), and the equity capital-to-assets ratio (*CAPITALRATIO*) of the borrower's main lender; an indicator that equals one if the main prior lender has a branch in the same state as the borrower (*LOCAL*); the logarithm of one plus the length of the lending relationship between the main prior lender and the borrower (*LNDURATION*); an indicator that equals one if the borrower has a pre-existing investment banking relationship with a bank other than its main lender (*OTHERIBREL*); year indicators (*YR*); and industry indicators (*IND*). All variables are explained in detail in Appendix A, under the heading, "Switching Lenders." Columns (1) and (2) provide the results of estimations using loan deals where the firm issues either public debt or public equity between January 1997 and June 2004 (*ISSUEPUB* = 1). Columns (3) and (4) summarize estimations using loan deals where the firm does not issue public debt or public equity between January 1997 and June 2004 (*ISSUEPUB* = 0). The odd numbered columns ((1) and (3)) show the probability of switching to "New CB-IB" instead of staying with "Prior Lender" while the even numbered columns ((2) and (4)) show the probability of switching to "New CB" instead of staying with "Prior Lender." Panel A provides the results of the base model. Panel B shows differential effects of CB-IB mergers, based on the whether the borrower is rated or unrated. Panel C reports the results of estimating the model after replacing the logarithm of the borrower's total assets (*LNASSETS*), the borrower's return on assets (*ROA*), and the borrower's debt-to-asset ratio (*LEVERAGE*) with corresponding variables that are measured during the year after the loan year (*LNASSETSYR+1*, *ROAYR+1*, and *LEVERAGEYR+1*). Coefficients for industry dummies (*IND*) and year dummies (*YR*) are not reported. Standard errors are White heteroskedastic consistent and clustered at the borrower-level and z-scores are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A: Base Model				
	Issue Public Securities		Does Not Issue Public Securities	
	Switch CB-IB vs. Stay (1)	Switch CB vs. Stay (2)	Switch CB-IB vs. Stay (3)	Switch CB vs. Stay (4)
PRIORCBIBREL	-1.082 ** (2.22)	-0.048 (0.11)	0.273 (0.86)	-0.506 (1.56)
<i>Firm Variables</i>				
LNASSETS	0.116 (0.68)	-0.190 (1.10)	0.016 (0.14)	-0.055 (0.41)
ROA	-6.404 *** (3.19)	1.610 (0.59)	0.559 (0.75)	0.706 (0.80)
LEVERAGE	0.132 (0.13)	0.270 (0.35)	1.250 *** (2.95)	1.336 ** (2.55)
IGRADE	0.705 (1.17)	0.274 (0.44)	0.118 (0.19)	-0.065 (0.11)
JUNK	-1.487 ** (2.04)	0.388 (0.87)	-0.466 (1.12)	-0.675 * (1.74)
<i>Bank Variables</i>				
LOANMKTSHR	-5.930 (1.45)	-10.165 *** (2.68)	-8.331 *** (3.03)	-5.678 * (1.71)
LIQUIDITY	-13.611 * (1.74)	-3.202 (0.53)	3.482 (0.67)	-3.580 (0.64)
CAPITALRATIO	11.118 (1.25)	-14.189 (1.54)	-24.249 ** (2.49)	12.023 (1.63)
<i>Firm-Bank Relationship Variables</i>				
LOCAL	-0.489 (1.33)	-0.355 (1.05)	-0.363 (1.33)	-0.341 (1.24)
LNDURATION	0.036 (0.08)	-0.431 (1.12)	0.596 * (1.93)	0.322 (1.21)
OTHERIBREL	-0.342 (0.82)	0.421 (1.08)	-0.045 (0.13)	-0.126 (0.45)
Intercept	-4.596 (1.23)	4.016 (1.15)	-3.988 (1.55)	-0.784 (0.30)
YR Fixed Effects	Yes	Yes	Yes	Yes
IND Fixed Effects	Yes	Yes	Yes	Yes
Log Likelihood	-289.79		-472.85	
Pseudo R-Squared	0.15		0.13	
Number of Loan Deals	486		727	

Panel B: Differences between Rated and Unrated Borrowers				
	Issue Public Securities		Does Not Issue Public Securities	
	Switch CB-IB vs. Stay (1)	Switch CB vs. Stay (2)	Switch CB-IB vs. Stay (3)	Switch CB vs. Stay (4)
NR X PRIORCBIBREL	-1.283 ** (2.21)	-0.217 (0.42)	0.553 (1.59)	-0.299 (0.85)
RATED X PRIORCBIBREL	-0.760 (1.15)	0.219 (0.36)	-0.698 (1.23)	-1.400 ** (2.35)
<i>Firm Variables</i>				
LNASSETS	0.136 (0.80)	-0.179 (1.04)	0.027 (0.24)	-0.043 (0.31)

(continued)

Table 4 (continued)

ROA	-6.496 *** (3.21)	1.639 (0.60)	0.461 (0.62)	0.605 (0.72)
LEVERAGE	0.047 (0.05)	0.224 (0.29)	1.257 *** (2.90)	1.324 ** (2.51)
IGRADE	0.322 (0.40)	0.005 (0.01)	1.004 (1.43)	0.369 (0.55)
JUNK	-1.836 * (1.78)	0.200 (0.39)	0.361 (0.65)	-0.318 (0.73)
<i>Bank Variables</i>				
LOANMKTSHR	-5.923 (1.45)	-10.040 *** (2.65)	-8.775 *** (3.21)	-6.138 * (1.81)
LIQUIDITY	-13.101 * (1.68)	-2.997 (0.49)	5.049 (0.97)	-3.032 (0.54)
CAPITALRATIO	11.243 (1.30)	-13.928 (1.53)	-24.416 ** (2.44)	12.274 * (1.67)
<i>Firm-Bank Relationship Variables</i>				
LOCAL	-0.454 (1.24)	-0.334 (0.98)	-0.334 (1.23)	-0.327 (1.19)
LNDURATION	0.073 (0.16)	-0.415 (1.08)	0.554 * (1.77)	0.283 (1.05)
OTHERIBREL	-0.315 (0.75)	0.436 (1.11)	-0.069 (0.20)	-0.137 (0.49)
Intercept	-4.972 (1.34)	3.780 (1.09)	-4.536 * (1.73)	-1.092 (0.42)
YR Fixed Effects	Yes	Yes	Yes	Yes
IND Fixed Effects	Yes	Yes	Yes	Yes
Log Likelihood	-289.36		-469.93	
Pseudo R-Squared	0.16		0.14	
Number of Loan Deals	486		727	

Panel C: Replacing Firm Variables with Ex-Post Firm Variables (Sample: Issuers of Public Securities)

	Switch CB-IB vs. Stay (1)	Switch CB vs. Stay (2)	Switch CB-IB vs. Stay (3)	Switch CB vs. Stay (4)
PRIORCBIBREL	-0.945 * (1.83)	0.059 (0.13)		
NR X PRIORCBIBREL			-1.087 * (1.75)	-0.035 (0.07)
RATED X PRIORCBIBREL			-0.737 (1.12)	0.208 (0.33)
LNASSETS _{YR+1}	0.167 (0.99)	-0.200 (1.09)	0.177 (1.06)	-0.193 (1.06)
ROA _{YR+1}	-3.629 (1.45)	1.487 (0.62)	-3.616 (1.46)	1.470 (0.62)
LEVERAGE _{YR+1}	0.151 (0.15)	0.148 (0.18)	0.116 (0.12)	0.124 (0.15)
All Base Model Variables (not <i>LNASSETS</i> , <i>ROA</i> , and <i>LEVERAGE</i>)	Yes	Yes	Yes	Yes
Log Likelihood	-275.68		-275.53	
Pseudo R-Squared	0.15		0.15	
Number of Loan Deals	460		460	

Table 5
Probability of Switching Lenders
Commercial Bank – Commercial Bank Mergers

This table presents the results of a probit model, using the 1,213 loan deals from 1997 through 2002 where the borrower has an existing lending relationship at the time of the loan deal with a commercial bank ranked in the top-50 by total domestic commercial & industrial (C&I) loans (ranked as of the end of 1996). The dependent variable is *SWITCHLEND*, which is an indicator variable that equals one if the firm selects any commercial bank that has not provided a loan to the firm between January 1992 and the loan date. The key independent variable is *CBMERGE*, an indicator variable that equals one if the borrower has a relationship with a commercial bank that has merged with another commercial bank (ranked in the top-50 of C&I lenders as of the end of 1996) prior to the loan deal. Other independent variables are the logarithm of the borrower's assets (*LNASSETS*); the borrower's return on assets (*ROA*); the borrower's debt-to-asset ratio (*LEVERAGE*); indicators that equal one if the borrower is investment-grade rated (*IGRADE*) or junk rated (*JUNK*); the market share of commercial & industrial loans (*LOANMKTSHR*), the cash-to-assets ratio (*LIQUIDITY*), and the equity capital-to-assets ratio (*CAPITALRATIO*) of the borrower's main lender; an indicator that equals one if the main prior lender has a branch in the same state as the borrower (*LOCAL*); the logarithm of one plus the length of the lending relationship between the main prior lender and the borrower (*LNDURATION*); an indicator that equals one if the borrower has a pre-existing investment banking relationship with a bank other than its main lender (*OTHERIBREL*); year indicators (*YR*); and industry indicators (*IND*). All variables are explained in detail in Appendix A, under the heading, "Switching Lenders." Columns (1) and (2) contain results from estimations using loan deals where the firm issues either public debt or public equity between January 1997 and June 2004 (*ISSUEPUB* = 1). Columns (3) and (4) contain results from estimations using loan deals where the firm does not issue public debt or issue or public equity between January 1997 and June 2004 (*ISSUEPUB* = 0). The estimations in columns (1) and (3) are of the base model. The results in columns (2) and (4) show differential effects of CB-IB mergers, based on the whether the borrower is rated or unrated. Coefficients for industry dummies (*IND*) and year dummies (*YR*) are not reported. Standard errors are White heteroskedastic consistent and clustered at the firm-level and z-scores are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	Issue Public Securities		Does Not Issue Public Securities	
	(1)	(2)	(3)	(4)
CBMERGE	0.010		-0.123	
	(0.06)		(0.94)	
NR X CBMERGE		-0.006		-0.181
		(0.03)		(1.24)
RATED X CBMERGE		0.034		0.056
		(0.15)		(0.24)
<i>Firm Variables</i>				
LNASSETS	-0.059	-0.058	-0.015	-0.017
	(0.81)	(0.79)	(0.29)	(0.33)
ROA	-0.831	-0.837	0.382	0.368
	(0.83)	(0.84)	(0.94)	(0.92)
LEVERAGE	0.083	0.081	0.758 ***	0.757 ***
	(0.24)	(0.23)	(3.45)	(3.45)
IGRADE	0.329	0.308	0.022	-0.110
	(1.26)	(1.01)	(0.08)	(0.36)
JUNK	-0.079	-0.098	-0.295 *	-0.409 *
	(0.37)	(0.40)	(1.72)	(1.84)
<i>Bank Variables</i>				
LOANMKTSHR	-5.324 ***	-5.337 ***	-3.825 ***	-3.687 ***
	(3.19)	(3.20)	(2.91)	(2.79)
LIQUIDITY	-2.243	-2.272	0.160	0.018
	(0.89)	(0.90)	(0.07)	(0.01)
CAPITALRATIO	-4.548	-4.562	0.376	0.382
	(1.11)	(1.12)	(0.10)	(0.10)
<i>Firm-Bank Relationship Variables</i>				
LOCAL	-0.192	-0.191	-0.196	-0.204 *
	(1.28)	(1.27)	(1.64)	(1.71)
LNDURATION	-0.188	-0.186	0.255 *	0.266 **
	(1.03)	(1.02)	(1.96)	(2.05)
OTHERIBREL	0.115	0.117	-0.074	-0.069
	(0.71)	(0.71)	(0.57)	(0.53)
Intercept	1.251	1.239	-0.730	-0.676
	(0.87)	(0.86)	(0.68)	(0.63)
YR Fixed Effects	Yes	Yes	Yes	Yes
IND Fixed Effects	Yes	Yes	Yes	Yes
Log Likelihood	-246.24	-246.23	-388.02	-387.60
Pseudo R-Squared	0.07	0.07	0.06	0.06
Number of Observations	486	486	727	727

Table 6
Estimating Differences in the Yield Spreads of Loan Contracts

This table provides estimates of the mean difference between the yield spread (YSPREAD) of loans from commercial-investment banks (CB-IB) and loans from commercial banks (CB). *YSPREAD* is the rate that the borrower pays to the lender (inclusive of fees), quoted in basis points over LIBOR. Loans from CB-IBs are from lenders that have merged with an investment bank by the date of the loan while loans from CBs are loans where the lender has not merged with an investment bank by the loan date. I compute propensity scores, match loans from CB-IBs to loans from CBs using the propensity scores, and estimate the differences in yield spread between the two types of loans. Propensity scores are computed using a probit model. The dependent variable is *IBMERGE*, an indicator variable that is one at any date after the lender merges with an investment bank. The independent variables are: the logarithm of the borrower's assets (*LNASSETS*); the borrower's return on assets (*ROA*); the borrower's debt-to-asset ratio (*LEVERAGE*); indicators for the borrower's long term Standard & Poor's debt rating (*AAA, AA, A, BBB, BB, B, CCC, CC, C, NR*); the lender's cash-to-assets ratio (*LIQUIDITY*), the lender's equity capital-to-assets ratio (*CAPITALRATIO*); an indicator that equals one if the lender has a branch in the same state as the borrower (*LOCAL*); the logarithm of one plus the length of the lending relationship (*LNDURATION*); an indicator that equals one if the borrower has a pre-existing investment banking relationship with a bank other than its lender (*OTHERIBREL*); the logarithm of one plus the length of the loan (*LNLENGTH*); the logarithm of the notional size of the loan (*LNFACTSIZE*); dummy variables that correspond to the type of loan (*LOANTYPE*); dummy variables that indicate the purpose of the loan (*LOANPURPOSE*); year indicators (*YR*); and industry indicators (*IND*). All variables are explained in detail in Appendix A, under the heading "The Pricing of Loan Contracts." Estimators are nearest neighbor matching with 10 CB loans and kernel-based matching. In all Panels, results are displayed for three samples – (i) all loans, (ii) loans to unrated borrowers, and (iii) loans to rated borrowers. In Panel A, columns (1) and (3) are for the sample of loans where the borrower issues public securities between January 1997 and June 2004 (*ISSUEPUB=1*) while columns (2) and (4) are for the sample of non-issuers (*ISSUEPUB=0*). In Panels B and C, results are for loans where the borrower issues public securities. Columns (1) and (3) use loans where the borrower and lender do not have a prior lending relationship while in columns (2) and (4), the borrower and lender have a prior lending relationship. In Panel B, the standard model is used to compute propensity scores. Panel C reports the results of estimating the model after replacing the logarithm of the borrower's total assets (*LNASSETS*), the borrower's return on assets (*ROA*), and the borrower's debt-to-asset ratio (*LEVERAGE*) with corresponding variables that are measured during the year after the loan year (*LNASSETSYR+1, ROAYR+1, and LEVERAGEYR+1*). Panel D displays the average yield spread difference between loans from commercial banks that have merged with other commercial banks (CB-CB) and loans from commercial banks that have not merged with other commercial banks, by computing propensity scores with the dependent variable *CBMERGE*, an indicator variable that is one at any date after the lender merges with another top-50 commercial bank. I report T-ratios in parentheses, which are calculated using standard errors that are computed by bootstrapping with 50 replications. ***, **, * indicates significantly different than zero at the 1%, 5%, and 10% level, respectively.

		Nearest Neighbor		Kernel	
		Issues Public Securities (1)	Does Not Issue Public Securities (2)	Issues Public Securities (3)	Does Not Issue Public Securities (4)
<i>ALL LOANS</i>	Coefficient	-24.221 ***	-7.068	-29.400 **	-7.044
	T-Ratio	(-2.67)	(-1.15)	(-2.49)	(-0.78)
	# of Matches	633	1,036	633	1,036
<i>NR</i>	Coefficient	-18.871 **	-6.607	-26.763 **	4.064
	T-Ratio	(-2.25)	(-1.01)	(-2.21)	(0.54)
	# of Matches	424	808	424	808
<i>RATED</i>	Coefficient	0.010	17.813	4.376	30.889
	T-Ratio	(0.00)	(0.88)	(0.15)	(0.98)
	# of Matches	172	216	172	216

(continued)

Table 6 (continued)

Panel B: New Relationship / Existing Relationship Comparison (Sample: Issuers)

		Nearest Neighbor		Kernel	
		New Relationship	Existing Relationship	New Relationship	Existing Relationship
		(1)	(2)	(3)	(4)
<i>ALL LOANS</i>	Coefficient	-25.774 ***	1.451	-29.632 *	-15.200
	T-Ratio	(-2.54)	(0.10)	(-1.81)	(-0.70)
	# of Matches	320	303	320	303
<i>NR</i>	Coefficient	-27.363 **	-3.492	-34.896 ***	-5.140
	T-Ratio	(-2.47)	(-0.22)	(-2.57)	(-0.28)
	# of Matches	229	187	229	187
<i>RATED</i>	Coefficient	13.938	8.514	8.455	28.976
	T-Ratio	(0.73)	(0.36)	(0.29)	(0.82)
	# of Matches	78	72	78	72

Panel C: New Relationship / Existing Relationship Comparison with Ex-Post Firm Variables (Sample: Issuers)

		Nearest Neighbor		Kernel	
		New Relationship	Existing Relationship	New Relationship	Existing Relationship
		(1)	(2)	(3)	(4)
<i>ALL LOANS</i>	Coefficient	-28.673 **	1.129	-19.781	13.342
	T-Ratio	(-2.34)	(0.08)	(-1.42)	(0.55)
	# of Matches	301	274	301	274
<i>NR</i>	Coefficient	-25.756 **	4.208	-24.563 **	10.768
	T-Ratio	(-2.49)	(0.31)	(-1.97)	(0.59)
	# of Matches	215	162	215	162
<i>RATED</i>	Coefficient	7.612	35.708	39.510	-17.655
	T-Ratio	(0.35)	(1.41)	(0.98)	(-0.46)
	# of Matches	72	65	72	58

Panel D: Commercial Bank Mergers (Sample: Issuers)

		Nearest Neighbor			Kernel		
		All Loans	New Relationship	Existing Relationship	All Loans	New Relationship	Existing Relationship
		(1)	(2)	(3)	(4)	(5)	(6)
<i>ALL LOANS</i>	Coefficient	-7.894	-9.720	5.316	-12.818	-13.778	3.477
	T-Ratio	(-0.97)	(-1.01)	(0.41)	(-1.11)	(-0.78)	(0.22)
	# of Matches	588	297	282	588	297	282
<i>NR</i>	Coefficient	-5.743	-10.295	9.264	-6.936	-4.464	9.663
	T-Ratio	(-0.63)	(-1.22)	(0.54)	(-0.65)	(-0.30)	(0.57)
	# of Matches	413	216	187	413	216	187
<i>RATED</i>	Coefficient	-4.932	17.351	7.997	15.477	4.174	-4.975
	T-Ratio	(-0.18)	(0.76)	(0.40)	(0.52)	(0.10)	(-0.13)
	# of Matches	155	56	90	155	56	90