Relationship Banking and the Pricing of Financial Services

Charles W. Calomiris and Thanavut Pornrojnangkool*

This Version: February 2006

<u>DRAFT: DO NOT QUOTE WITHOUT PERMISSION</u>

* Calomiris is the Henry Kaufman Professor of Financial Institutions at Columbia Business School, Professor of International and Public Affairs at Columbia's SIPA, the Arthur Burns Fellow in International Economics at the American Enterprise Institute, and a Research Associate at the National Bureau of Economic Research. Pornrojnangkool is a Ph.D. candidate at Columbia Business School. We thank Paul Efron and seminar participants at the Columbia Business School, the New York Fed, the Federal Reserve Board, the University of Western Ontario, and George Mason University for helpful comments. Please address comments to: Charles W. Calomiris, email: cc374@columbia.edu

ABSTRACT

We investigate how banking relationships affect the terms of lending, through both supply- and demand-side effects, and the underwriting costs of debt and equity issues. We use micro-level loan and underwriting data to investigate pricing effects of the joint production of loans and security underwritings within the context of relationship banking. We capture and control for firm characteristics, including differences in the sequences of firm financing decisions, and assemble a database of the financial histories of 7,315 firms, comprising their loans, debt issues, and equity issues for the period 1992 to 2002. We address several shortcomings in prior studies, which results in significant improvement in the explanatory power of our regressions when compared to prior studies. We find no evidence that universal banks under-price loans to win underwriting business, which also rules out any possibility of illegal "tying." We do find evidence that banks price loans and underwriting services in a strategic way to extract value from their relationships. In particular, we find that banks charge premiums for both loans and underwriting services to extract value from their combined lending and underwriting relationships. We also find that universal banks enjoy cost advantages in both lending and underwriting, irrespective of relationship benefits. Part of the advantages borrowers enjoy from bundling products within a banking relationship may include a reduced demand for borrowing, which takes the form of reduced demand for lines of credit. We find evidence of a "road show" effect from debt underwritings to loan pricing discounts.

1. Introduction

This paper focuses on the consequences for the pricing of financial transactions of the bundling of those transactions within the same banking relationship. From the outset it is important to distinguish bundling from illegal "tying." Bundling is a well-established practice within the banking industry whereby banks offer multiple financial products and services to customers as a part of durable relationships. In theory, banks should price related product offerings to meet their internal profitability standards on a total customer relationship basis. In practice, banks generally offer arrays of products[1] to customers, and products may be bundled together. Laws do not prohibit this practice of relationship banking or product bundling as long as customers have the option to refuse bundling.

Tying, on the other hand, is a different concept whereby the sale or price of a "main" product, in which the seller potentially has market power, is conditioned upon the requirement that customers also purchase the "other" products, with the goal of leveraging market power in the "main" product to improve the performance of "other" products.[2]

---

[1] Bank regulators classify products that banks offer into traditional and non-traditional banking products. Traditional banking products are products that traditionally are offered by banks such as bank credit, deposit, custodian business, cash management, and trust service. Non-traditional banking products are, for example, insurance policy, wealth management service, and underwriting business.

[2] Tying in this manner can be illegal in any product markets by general antitrust laws because of its anti-competitive effects. The Clayton Antitrust Act explicitly prohibits exclusive dealing arrangements or tying arrangements, where the seller conditions the sale of a desired product upon the buyer purchasing another product, where competition is likely to be lessened substantially. See Clayton Act, 15 U.S.C. § 14.

In the banking industry, section 106 of the Bank Holding Company Act Amendment of 1970 explicitly prohibits the tying of traditional banking products to non-traditional banking products. Consistent with the intent of the law, regulators have adopted a strict interpretation of illegal tying to include only transactions that give rise to the potential extension of market power in traditional banking products to non-traditional banking products. According to a Federal Reserve interpretation (see Fed Reg. 52024 Aug 29,2003), the bundling of banking products constitutes illegal tying only when all of the following conditions are met: 1) tying is initiated by the bank, 2) tying involves at least two products, a borrower's "desired" traditional banking product and another non-traditional banking product, 3) the pricing and/or availability of the "desired" product is conditioned on the borrower's purchase of another non-traditional banking product (a tied product), and 4) at the time of negotiation, the bank does not present meaningful unbundled

Concerns about tying lending to security underwriting to win underwriting business emerged only recently; until the 1980s the Glass-Steagall Act of 1933 was interpreted as prohibiting banks from underwriting corporate securities. As the restriction on underwritings was gradually lifted since 1987, regulatory interest in the consequences of the bundling of lending and underwriting services has increased. The Glass-Steagall Act was repealed by the Gramm-Leach-Bliley Act of 1999. The law allows the bundling of lending and underwriting services by universal banks but the prohibition for tying remains.[3]

Mullineaux (2003), among others, argues that the necessary conditions for illegal tying by universal banks are unlikely to be met in the current market environment. The corporate lending market for large firms is predominately a syndicated market, includes many lenders, and is highly competitive. Banks have little apparent market power in this market, so there is little potential to abuse power or to extend it to other (e.g., underwriting) services. A large firm is unlikely to hire a particular universal bank as

---

alternatives to the borrower. See Office of the Comptroller of the Currency (2003) for some legal perspective and some discussion regarding the original intents of the anti-tying laws.

Closely related to anti-tying laws, section 23B of the Federal Reserve Act 1913 also prohibits any transactions that may benefit non-bank affiliates at the expense of insured banks. Effectively, this regulation prohibits banks from under-pricing loans to win underwriting businesses for their non-bank affiliates. The economic argument for this regulation is simple. Under-pricing loans might help weak banks increase their safety net subsidies by channeling income from insured banks to the uninsured security affiliates.

[3] The in-roads made by universal banks into the securities underwriting business have prompted competitive concerns among specialized investment banks. Press coverage (e.g., *The Economist*, 1/9/2003, *American Banker*, 9/27/2002) and practitioner surveys (e.g., Association for Financial Professionals 2004 Credit Access Survey) worry that potential tying practices by universal banks may be used to compete unfairly for underwriting business against stand-alone investment banks. However, studies by regulators and government agencies indicate no widespread practice of illegal tying, despite the substantial increases in the market shares of universal banks in underwriting services. Regulators point to the need to distinguish between the illegal practice of tying and the legal practice of product bundling (e.g., General Accounting Office 2003). Not surprisingly, investment banks that are losing market share to universal banks may confound the two phenomena in their assessments of whether there is a "problem" of loan under-pricing by universal banks.

underwriter just to be able to get a loan from that bank when the lending market is competitive.[4]

Of course, in some circumstances, market power may be an important issue. Calomiris and Pornrojnangkool (2005) provide evidence that regional market power can exist for some lending market segments, such as middle-market lending, when a single lender dominates that segment of the market and borrowers are not large to obtain sufficiently attractive terms from large lenders outside the region. However, the segment of the market in which banking relationships are most likely to combine lending with underwriting services is the large corporate segment, and these borrowers enjoy national market access, so market power in lending is unlikely. Nonetheless, it is possible that specific circumstances may exist that give banks an upper hand in negotiations with clients, which may give rise to illegal tying.[5]

Even if the illegal tying of lending and underwriting are unlikely in the United States today, it is still of interest to understand the consequences for lending and underwriting costs of their joint production. Has the bundling of lending and underwriting created net benefits from joint production, and if so, how have those benefits been shared between banks and their clients? Do those net benefits show themselves in the pricing of bundled lending and underwriting services?

---

[4] Similarly, there are reasons to question whether violations of Section 23b are occurring, or that such violations could explain the growing market shares of universal banks in securities underwriting. Reforms of prudential regulation since 1991 (the FDICIA of 1991, and recent modifications of the Basel standards to emphasize internal risk controls at large banks), along with historically high bank capital ratios, should limit the incentives that large banks face to transfer income out of protected (deposit insured) commercial bank affiliates, even if regulators and supervisors were not able to observe and prevent safety net abuse.

[5] On August 27, 2003, the Federal Reserve released a Combined Consent Order to Cease and Desist against WestLB AG and its New York branch, citing violations of anti-tying restrictions.

Another important question is whether universal banks enjoy a comparative advantage in providing lending and underwriting services in comparison to stand-alone investment banks. Universal banks have gained enormous market share in underwriting. Does that reflect a fundamental cost advantage or an unfair competitive advantage related to the possession of a commercial banking charter? Does the cost advantage of universal banks show itself in both the lending function and the underwriting function? How do cost advantages or disadvantages across banks affect strategic pricing behavior?

We compare banks' pricing behavior for bundled and non-bundled transactions, and compare the lending and underwriting costs charged by stand-alone investment banks with those charged by universal banks. Our study of pricing policies across these types of banks, and across different circumstances, provides new insights about the costs and pricing strategies of different banks under different circumstances, and offers some guidance to regulators about whether universal banks' success should concern them.[6]

Section 2 provides a review of the literature. Section 3 reviews our data sources and our empirical methodology. Section 4 presents our findings, including the estimation of supply and demand functions for borrowing, and non-structural estimates of the cost of underwriting services. Section 5 concludes.

2. Literature Review

An early line of research on the joint production of lending and underwriting focused on conflicts of interest. A conflict can arise from a moral hazard problem, where universal banks learn negative private information about a firm and induce the firm to

---

[6] A 10/2/3003 letter from Board of Governors of the Federal Reserve System to the U.S. General Accounting Office indicates their current effort the study loan pricing behavior to potentially improve the enforcement of anti-tying and loan underpricing regulations.

issue debt in the market to repay outstanding loans to the bank before the negative information is revealed to the market. Here, bankers harm securities purchasers by withholding pertinent information from them. An adverse selection problem can also create a conflict of interest in this setting. Universal banks may cherry-pick transactions by lending to the best quality firms and bringing poor quality firms to the debt market.

Kroszner and Rajan (1994) focus on the pre-Glass Steagall era and compare the ex-post performance of bonds underwritten by universal banks with bonds underwritten by investment banks, after controlling for ex-ante risk profiles. They find that bonds underwritten by universal banks default significantly less often than (ex-ante similar) issues underwritten by investment banks. That finding indicates that potential conflicts of interest either were absent or were overcome by other banking practices and reputational considerations.

Focusing on bond issues from the same period, Kroszner and Rajan (1997) investigate ex-ante pricing of bonds (i.e., yield spreads over Treasuries) and document that the market rewards universal banks for placing their underwriting business within a separate subsidiary (as opposed to an internal department) as one of the ways to mitigate potential conflicts of interest, a finding that may help to explain the apparent lack of conflict observed in Kroszner and Rajan (1994).

Joint production of multiple banking products can provide economies of scope due to information reusability and efficiency gains associated with better portfolio diversification, scale-related economies of scope in product delivery, and lower costs (e.g. Calomiris 2000, Calomiris and Karceski 2000). There is a vast literature on the cost functions in banks, which seeks to measure scope economies across activities, with little success (e.g., Berger and Humphrey 1991, Pulley and Humphrey 1993).[7]

The joint production of lending and underwriting may give rise to bank quasi rent creation and extraction in the context of relationship management (e.g., Greenbaum, Kanatas and Venezia 1989, Sharpe 1990, Rajan 1992). In the case where it is costly for a firm to credibly communicate its prospects to the public or to other banks, an informed banker can gain market power that can potentially be translated into charging higher prices for some loans and other services. This line of reasoning receives more attention in our empirical discussion below. Some of our findings support the notion that bank-borrower relationships entail the creation of quasi rents, and that banks are able to extract some of those rents.

Puri (1996) investigates bond yield spreads over Treasuries for the pre-Glass Steagall era and documents that universal banks obtain better prices for their customers than investment banks do. This provides some evidence of net benefits from the joint production of loans and debt underwriting. For the more recent period, Gande, Puri, Saunders and Walter (1997) compare the yield spreads of bonds underwritten by

---

[7] As pointed out by Rajan (1995), it can be difficult to detect scope economies due to difficulties in estimating bank cost functions precisely. A potentially more promising approach is to investigate micro-level data that enable researchers to measure interactions among various types of production activities directly. More recent studies pursue this line of analysis by comparing loan spreads, underwriting fees, and ex-ante performance of the security offerings between bundling and non-bundling transactions. Nonetheless, the results from these studies are not conclusive.

In addition to reducing clients' interest costs and fees, and increasing the securities prices clients are able to obtain from their issues, universal banking also may permit borrowers to save transaction costs (including "face time") by establishing more efficient communication procedures with a smaller number of financial institutions. Information production is costly for both banks and borrowers. The larger the number of banking relationships, the larger the amount of the resources a borrower has to allocate to communicate and coordinate with banks. To our knowledge, there is no study that directly focuses on transaction cost savings from bundling services, and we are unaware of any data that would permit such a study. While we do not pursue this line of research in this study, transaction cost savings from universal banking would be consistent with some of our findings, as discussed further below.

investment banks with the spreads of bonds underwritten by subsidiaries of commercial banks from 1993 to 1995. They find evidence that firms obtain better pricing for their bonds when they have an existing relationship with the underwriting bank. Roten and Mullineaux (2002) investigate the same question for bonds underwritten from 1995 to 1998 but find that an existing relationship with the underwriting bank has no impact on bond pricing. However, they find that banks on average charge lower underwriting fees (measured by gross underwriting spreads) than investment banks, regardless of relationships.

Drucker and Puri (2005) investigate 2,301 seasoned equity underwritings during the period 1996 to 2001. Of the 2,301 seasoned equity underwritings in their sample, 201 issues are bundled with 358 loans (that is, loans and underwriting services are provided by the same institution). They estimate a gross underwriting spread equation and find that investment banks offer a discount on their underwriting fees when an equity underwriting is bundled with a loan. The discount only applies to non-investment grade issuers, where the authors argue the gains from scope economies are relatively large. They find no underwriting fee discount for bundled issues underwritten by universal banks. In addition, they perform a matched sample analysis of bundled and non-bundled loans, comparing their all-in-spreads, and find that universal banks give a pricing discount to loans that are bundled with underwriting deals. They find no loan pricing discount on bundled loans from investment banks. Their results are consistent with the existence of economies of scope between lending and underwriting, although the authors find that universal banks and investment banks pass on the associated cost savings to firms through different channels, depending of the skills in which they have a comparative advantage.

Several other studies, which differ from Drucker and Puri (2005) in their methodologies, report somewhat contrary results. Fraser, Hebb and MacKinnon examine 1,633 revolving loans and 320 non-convertible debt issues from three large banks (Bank of America, JP Morgan Chase, and Citibank) during the period 1997 to 2001. They first run a regression controlling for the variables used in the matched sample analysis of Drucker and Puri (2005) and find a similar result for loan interest cost discount when banks bundle loans with underwritings. However, the discount disappears once fixed effects for lenders and additional control variables are included. They conclude that combining underwriting and lending in a single relationship has no impact on loan pricing by universal banks.

Sufi (2004) studies the underwriting fees and yield spreads of bonds underwritten by universal banks and investment banks from 1990 to 2003. The regression analysis includes firm fixed effects to control for time-constant unobserved heterogeneity among firms. The main finding of the paper is that universal banks provide a 10 to 15 percent discount in underwriting fees for joint transactions of loans and debt underwriting. However, there is no evidence of lower yields on bonds underwritten jointly with bank loans. This paper demonstrates that OLS estimates of the bond spread equation are biased and can lead to an incorrect inference when firm fixed effects are excluded or an insufficient number of control variables are included in the regression.

Schenone (2004) focuses on the possible effect of an existing lending relationship in reducing IPO underpricing. The study documents a substantial reduction in IPO underpricing for firms that have existing lending relationship with banks with underwriting capability (i.e., universal banks, as opposed to non-universal banks). However, whether the firms go public with their relationship banks (or, alternatively, choose to use another underwriter) has no incremental impact on IPO underpricing. One interpretation of these findings, which we try to take into account in our own results reported below, is that these results reflect selectivity bias. In particular, there may be characteristics associated with the decision of a firm to establish a relationship with a universal bank that are also associated with reduced IPO underpricing. The omitted variables that are of our interest here may be related to a firm's expected financing needs. For example, a firm with exceptional business opportunities and a foreseeable need for a future IPO may be more likely to establish a relationship with a universal bank. It might be the case that the firm characteristic of exceptional business opportunities explains the lower IPO underpricing found in the study; the firm's relationship with a universal bank, per se, may have no effect on underpricing. In the table below, we present a summary of the relevant studies discussed above.

Our primary objective is to revisit the issue of how bank relationships (both lending and underwriting) affect underwriting fees and the terms of loans. We employ a comprehensive dataset and a research methodology designed to isolate the effects of bundling on the supply functions for lending and underwriting. The distinguishing features of this paper include the following methodological innovations.

Summary of Literature Review

Study	Study Period	Type of Relationship	Variables of Interests	Summary of Findings
Kroszner and Rajan 1994	1921-1929	universal banks vs. investment banks debt underwritings	bond default rate	Bonds underwritten by universal banks default significantly less.
Puri 1996	1927-1929	universal banks vs. investment banks debt underwritings	bond offering price	Universal bank underwritings obtain better offering prices.
Kroszner and Rajan 1997	1925-1929	internal department vs. subsidiary underwriting structure	bond offering price	Subsidiary underwritings obtain better offering prices.
Gande, Puri, Saunders and Walter 1997	1993-1995	joint production of loans and debt underwritings	bond offering price	Underwriters with existing lending relationships obtain better offering prices.
Roten and Mullineaux 2002	1995-1998	joint production of loans and debt underwritings	bond offering price	Existing lending relationships have no impact on offering prices.
			underwriting fee	Universal banks charge lower fees regardless of existence of relationship.
Drucker and Puri 2005	1996-2001	joint production of loans and SEO underwritings	underwriting fee	Investment banks with existing lending relationships charge lower fees for non-investment grade issuers but no discount from universal banks.
			loan spread	Universal banks with existing lending relationships charge lower spread for loans but no discount from investment banks.
Fraser, Hebb and MacKinnon 20xx	1997-2001	joint production of loans and debt underwritings	loan spread	Underwriting relationships surrounding loan transaction has no impact on loan pricing.
Sufi 2004	1990-2003	joint production of loans and debt underwritings	underwriting fee	Universal banks with existing lending relationships charge lower fees.
			bond offering price	Existing lending relationships have no impact on on offering prices.
Schenone 2004	1998-2000	joint production of loans and IPO underwritings	IPO underpricing	Prior relationships with *propsective* underwriters reduce IPO underpricings regardless of who actually underwrites.

First, our study is comprehensive in its treatment of firms' financing decisions. Previous studies focus on a pair of transaction types (i.e., loans vs. debts or loans vs. equities) and usually investigate the pricing or fees of one type of transaction, ignoring the other type of transaction (with the exception of Drucker and Puri 2005). For example, Sufi (2004) and Roten and Mullineaux (2002) study the impact of an existing lending relationship on underwriting fees and the pricing of bond underwritings but ignore any pricing implication for the loan itself. The reason to examine all bank-borrower interactions together is simple: Any discount of underwriting fees on bundled offerings will have no impact on firm financing costs or on bank revenues if banks compensate for that discount by charging higher spreads on bundled loans. We construct a complete financing history of 7,315 firms (comprising of all loan, debt, and equity transactions[8]) for the period 1992 to 2002, which spans a decade in which commercial banks gradually entered the underwriting business and eventually were allowed to compete freely in the market. We investigate the effects of relationships on underwriting fees (for both bonds and equities) and on loan prices.

Second, our analysis of the loan market uses a structural modeling approach of the price and quantity of the loan. We explicitly allow the price and quantity of the loans to be determined jointly by the banks in our analysis. Our model posits determinants of loan supply and loan demand, some of which we identify as only affecting supply or demand. We utilize instruments to estimate loan supply and demand equations jointly using both two-stage least squares and a more robust Generalized Method of Moments approach. Previous studies have not tried to identify supply and demand, and thus have made strong implicit assumptions about the orthogonality of demand and supply effects.

Third, existing studies suggest that model misspecification is a possible explanation for the contradictory findings that appear in the various studies. Fraser, Hebb and MacKinnon show that discounts for loans from relationship banks disappear once sufficient variables controlling for risk and fixed effects for lenders are included in the regressions. Sufi (2004) also shows that bond yield discounts disappear when fixed effects for issuers are included in the regressions. We identify and take into account three potential sources of model misspecification: (1) insufficient inclusion of balance sheet and income statement characteristics of borrowers and issuers in the list of explanatory variables that control for differences in firms' riskiness; (2) insufficient controls for

[8] We exclude private placements of securities and commercial paper offerings for reasons discussed in section 3.

possible heterogeneity in the cost functions of lenders and underwriters; and (3) insufficient controls for heterogeneity in the financing strategies and objectives of borrowers and issuers (which could be relevant for loan pricing because they capture additional aspects of risk).

In our regressions, we employ larger sets of control variables than previously studies, and include all variables previously found to be important either in the pricing of loans or the setting of underwriting fees. In addition, we include variables that distinguish the type of financial institutions in the transactions (i.e., universal banks vs. investment banks) as well as proxies for lender reputation. Finally, we explicitly include variables that capture patterns of firm financing strategies in our regressions (in particular, the specific combinations of financings in which firms engage within defined windows of time). These variables capture otherwise omitted heterogeneity in firms that are likely related to risk, and which could influence the terms of loans and the fees charged by underwriters. The details of our regression specifications, and our dataset construction methods, are presented in Section 3.

3. Data Sources and Research Methodology

In constructing our dataset, our objective is to measure the effects of relationship formation on lending and underwriting behavior by capturing and controlling for firm risk characteristics, including the dynamic nature of firm financing needs. The effects of relationships have to be measured after controlling for the dynamic financing strategy of the firm. For example, if relationships are more frequently formed by firms that engage in many underwritings and loans at the same time, and if those firms have peculiar (otherwise unobserved) risk characteristics, then failing to control for the combination of financings chosen by the firm may lead to false inferences about the effects of relationships, per se, on loan pricing or underwriting costs.

An ideal dataset would contain a complete and detailed history of firm financing transactions, including bank loans and all public and private placements of securities. Such a database is not readily available. To the extent that it can be approximated, one must construct firm financing histories by combining multiple data sources.

This section details our approach to combining loan data from Loan Pricing Corporation's *DealScan* database and underwriting data from Securities Data Corporation (*SDC*) into a single dataset that contains all available information on the history of bank loans and public offerings for 7,315 U.S. firms during the period 1992 to 2002. Our data include deal pricing information, firm characteristics, and information about the identity of lenders and underwriters for each deal.

We exclude private placements of securities from our dataset due to the lack of pricing data for such deals. We do not regard the omission of private placements as a major shortcoming since private placements constitute a small portion of listed firms' financing transactions. Commercial paper offerings are also excluded, since these offerings are generally part of a long-term financing program (making the timing of the financing decision hard to measure) and because commercial paper offerings are accessible only to a select group of firms (for further discussion, see Calomiris, Himmelberg, and Wachtel 1995). To the best of our knowledge, we are the first to construct such a complete dataset of bank loans and public offerings and to use it to systematically address the issue of how relationship banking affects the pricing of financing transactions.

Loan Data

We searched the *DealScan* database for all bank loan deals for U.S. borrowers from 1992 to 2002. Since we are interested in industrial firms, we excluded all transactions related to financial institutions (firms with SIC 6) from the search. We also followed the precedent of many other studies by excluding regulated industries (those with SIC code starting with 43, 45, and 49)[9] and government-related deals (those with SIC code starting with 9) from the search. We further exclude borrowers with no stock ticker information available from the dataset to restrict our study to listed borrowers. In each deal, the data contain all loan facilities associated with the deal along with the list of lenders and their roles for each facility in the deal. Data on the all-in-spread cost of loans and other loan characteristics are also available from this source. Table I provides a summary of loan observations in the study broken down by lender types, loan classifications, and loan distribution method.

There are several points worth noting about the loan data. First, over the sample period, 1992 to 2002, the lending market is dominated by commercial banks. Roughly 99% of loans in the sample have commercial banks in the leading roles. Investment banks participate in the lending market primarily through relatively large loan syndications where commercial banks act as joint lead lenders. Second, there is an increased usage of short-term revolver facilities instead of longer-term ones as a result of a favorable

[9] We do not exclude all firms with SIC 4 to ensure that some high-tech and telecom industry firms are included in our study. These firms are a focus of tying accusations in the financial press and were active issuers during our study period.

regulatory capital requirement rule for lines of credit with less than one year to maturity.[10] Third, an increasing number of loans are syndicated over time.

Underwriting Data

Detailed data for all public offerings of common equity and bonds during 1992-2002 are obtained from the *SDC* database. The data also contain information on the gross underwriting spreads (total fees paid by the issuer to the underwriters) and the other expenses associated with the offerings. As before, we exclude issuers with SIC codes starting with 6, 9, 43, 45, and 49 from our sample. Table II provides a summary of underwriting deals in our sample broken down by type of financial institutions.

It is very clear from the sample that investment banks have been losing a significant amount of market share to universal banks, both for debt and equity underwriting, during our sample period. This trend represents a combination of two phenomena: in-roads by commercial banks into the underwriting business, and consolidations between investment banks and commercial banks.

Combining the Datasets

To link data in the different datasets, by firm, we utilize a unique identification number, namely *GVKEY*, assigned by *Compustat* to the each firm in its database. This unique identification numbering system eliminates the problem associated with changes in firms' names and stock ticker symbols during the study period. It also facilitates our matching of financing transaction data from *SDC* and *DealScan* with *Compustat* data on firm characteristics and market pricing data in the *CRSP* database.

[10] As we will show later, banks in fact charge lower spreads and provide larger credit lines for short-term revolving lines of credit.

To associate loan observations to the *GVKEY* variable in *Compustat*, we match stock ticker information from the *DealScan* dataset to the ticker variable in *Compustat* and combine data dated for the same quarter and year of the loan date, when available. This approach ensures that loan deals are assigned to the current owner of the ticker symbol at the time of the loan.[11] However, not all loan deals find a match in *Compustat.* Borrowers that cannot be matched through the easy method are searched manually, by name, for a possible match to the *Compustat* database. For underwriting deals from the *SDC* database, the issuers' CUSIP numbers are available and can be used to match with firms in *Compustat*. When matching cannot be accomplished using this method, the CUSIP numbers of the issuer's immediate parent or ultimate parent is used to match instead.

The resulting dataset can be used to track the history of financing transactions of a firm by sorting all transactions associated with a particular *GVKEY* by loan and underwriting dates. We have 7,315 firms with "complete" histories of financing transactions (i.e., all bank loans and securities offerings from *DealScan* and SDC) in our final dataset[12]. Once firms are matched, accounting information from *Compustat* and the market equity price from *CRSP* are added to the final dataset.

Research Methodology

Our period of study begins in 1992 (a time at which commercial banks were able to underwrite securities to a limited extent as the result of Federal Reserve actions).

[11] More than one firm may use the same ticker symbol at the different point in time. Care is necessary to match the current owner of the symbol (in the DealScan data) with the correct firm in the Compustat data.
[12] In matching loan and underwriting transactions, all observations from databases that can be matched to *Compustat* are included in order to obtain a complete history of financing transactions and matching relationships. However, not all transactions can be used in the regressions due to missing data for some variables used in those regressions.

Underwriting limits for commercial banks and "firewall" regulations were relaxed over time, and all limits were eliminated in 1999 under the Gramm-Leach-Bliley Act.

Our objective is to study differences in lending terms (price and quantity) and underwriting fees among borrowers that use different types of financial intermediaries, have different financing needs (that are potentially driven by unobserved firm characteristics), and have different banking relationship patterns. We thus classify firms' financing patterns and banking relationship patterns through time. To this end, we develop the concept of the "financing window" to capture differences in the dynamics of firms' financing needs, and to separate firm-level effects associated with combinations of financings, per se, from the effects of different financial relationship choices and service bundling decisions.

Defining Financing Windows

To capture the dynamic nature of financing transactions of a firm in a systematic way,[13] we define a financing window as a set of transactions that are temporally close together. Specifically, a window is defined as a cluster of financing events[14] that are at most one year apart from their closest neighboring transaction, and for which there are no other financing events (outside the window) happening within one year before or after the

[13] Existing studies on the effects of relationships focus their attention on either lending or underwriting transactions and define banking relationships surrounding a particular transaction. This approach ignores other transactions in the close neighborhood and may affect the conclusion reached about relationships, per se. For example, when a study focuses on a debt underwriting transaction and defines the existing banking relationship as any lending transactions prior to the debt underwriting transaction, a fee discount on debt underwriting deal may not be a consequence of the existing lending relationship if, for example, there are other equity or debt offerings prior to the current debt underwriting deal, as well. That is, the discount may be a consequence of prior security offerings that are ignored in the construction of the proxies for banking relationship. We also distinguish between patterns of financing according to the sequence in which various transactions occur, as explained in more detail below.

[14] Financial events can be a loan, a debt underwriting, or an equity underwriting.

window.[15] Using this definition, the window can have a length ranging from one year (with two financing events, one at the beginning and one at the end of the window) to as long as the total length of the study period (1992-2002). The vast majority of financing windows have a length of less than two years. Table III provides a summary of financing windows constructed by this method.[16] The last two rows of the table show the number of windows in our dataset broken down by the number of events in the window and the average length of the windows (in months). Not surprisingly, most of the windows have a pair of events occurring less than one year apart. This fact explains why varying the definition of windows has little effect on our findings.

Determining Lead Financial Institutions

The mergers, acquisitions, and reorganizations among financial institutions make it difficult to identify all banks/subsidiaries within a bank holding structure through time. To overcome this challenge, we develop an additional dataset containing the identities of large bank holding companies, their subsidiaries, and merger histories, in order to uniquely identify each financial institution in the dataset through time.[17] We assign a unique ID to *all* banks/subsidiaries within the same holding company. When mergers occur, the IDs are updated to reflect the new holding company. Similarly, unique IDs are assigned to all investment banks in our dataset.

In addition, several financial institutions usually participate in loan syndications or joint security underwriting. However, the degree of participation and the influence in

---

[15] We also defined the financing window with a 6-month events gap, as opposed to one year. The conclusions of the paper are insensitive to that alternative specification.

[16] Because our dataset is left-truncated in 1992, we exclude all windows where the first event we observe occurs in 1992, since it is unclear whether those windows actually start in 1992 or at an earlier date.

[17] Merger data are available from the BHC database provided at the Federal Reserve Bank of Chicago website. We also manually verify bank merger history and holding company structure with the website of the National Information Center of the Federal Reserve System for accuracy.

deal pricings vary according to their roles in the transaction. We credit a financial institution with the transaction *only if* it has a *leading* role as the originator or underwriter of the transaction. Specifically, the lead lenders for loans are defined as lenders with agent title in loan syndication documentation (e.g., managing agent, syndication agent, documentation agent, administrative agent) or act as the lender and arranger in non-syndicated loans. For underwriting deals, we adopt the definition of lead managers from the *SDC* database, where lead managers are defined as those with the role of book runner, joint book runner, or joint lead manager. Therefore, it is possible in our dataset that a loan or underwriting has multiple lead lenders or lead underwriters, which may give rise to ambiguity in defining bank-firm relationship. We devise quite a robust approach to handle this situation and will elaborate further below.

Constructing Control Variables for Firm Financing Needs

Having constructed financing windows that define combinations of transactions, and their sequence, we proceed to define firm financing needs for each of the events within the financing windows (loans, debt offerings, and equity offerings) according to the existence of other events within the windows. We use the following six dummy variables that are designed to capture patterns of firm financing strategies by describing the temporal relationship between the current event and all the other events in the same window: *PL, PD, PE, SL, SD,* and *SE*. The variables *PL*, *PD*, and *PE* equal one, respectively, if there are other loan, debt, or equity events *preceding* the current event within the financing window. Whereas *SL, SD*, and *SE* equal one, respectively, if there are other loan, debt, and equity events *subsequent* to the current event within the financing window. These six dummy variables are clearly defined for each event in a financing window regardless of the identities of the lenders/underwriters involved in the event and can be used in the regressions to control for unobserved heterogeneity among firms related to differences in the patterns of their financial needs, per se.

Constructing Proxies for Relationship Variables

In the context of our analysis, we define a relationship between a bank and a firm as the repetition of this bank-firm pairing in multiple events within the financing window. Therefore, a bank-firm relationship can take the form of repeating loans, repeating debts, repeating equities, or any combination of these transactions by this bank-firm pair within a window.

When *all* of the lead lenders/underwriters for *all* events within a financing window are unique, we identify this window as an *unmatched window*. In this case, a firm uses different lenders/underwriters of all events in the window and there is no identifiable relationship in the window. Clearly, a single-event window is an unmatched window by definition. A financing window is a *matched window* when *one or more* lead lenders/underwriters in the window (as identified by their unique IDs defined earlier) lead *more than one* transaction within the window. Therefore, it is possible to have several relationships embedded within a matched window. Figure 1 provides a diagram depicting the classification of events for different type of windows and relationships.

First, consider the cases of unmatched windows. By construction, all events in the unmatched windows are *unmatched events*. We use these events as a control group to isolate the effects of relationship on deal pricings. When an unmatched event involves a single lead financial institution, the identity and characteristic of lead institution to be used in the regressions are obvious. However, it is less clear when there are multiple lead bankers in the event. One possible approach for the regression analysis is to include all possible bank-firm pairings from each event in the regressions. For example, a two-event window comprised of a loan (with two lead lenders) followed by a debt underwriting (with two lead underwriters) creates four possible observations for the regression analysis (two observations for loan regressions and two observations for debt regressions). This approach essentially double-counts some events, thus may suffer from non-random sampling bias induced by the correlation among observations from the same event. Instead, we handle unmatched loans with multiple lead institutions by randomly assigning a lead institution to each event in order to create a unique bank-firm matching. This approach to assigning bank-firm matches to our control (unmatched) group does not introduce any systematic bias in measuring the effects of relationships on deal pricings, which is evident in our robustness tests (not reported).[18]

In a matched window, if *only one* financial institution is involved in multiple events in the window, then there is a *unique relationship* in this window. We simply assign these matched events to the relationship bank in the regressions and discard any unmatched events from the analysis. However, when *more than one* financial institution leads (or jointly leads) multiple events in the window, we include only events from the financial institution with the *strongest* relationship in the regressions, where the strength

[18] In results not reported here, we perform the following robustness tests for our approach to randomly assigning a lead banker to each event. For the first robustness test, we redraw several trials of the random assignment of a banker-firm match for the set of unmatched loans. Our regression results are practically unchanged from one trial to another. For the second test, we average lender/underwriter characteristics across all banks and assign the average value to that event in the regressions. In our specification, the only lender/underwriter characteristic used in the regressions is the lending/underwriting market shares. In addition to the *IB* dummy variable, whose value indicates the fact that the event involves exclusively investment banks, we also include a dummy variable *MIX* to indicate mixed commercial and investment banks deal (the base case regression corresponds to deals that are done exclusively by commercial banks). The regression results for these robustness tests are very similar to the ones reported here in the paper.

of a bank-firm relationship is measured by the number of repeated transactions done by that relationship bank within that window.[19]

In 2,377 of our 4,411 matched window observations for loans, we identify unique matches within the window (that is, transactions involving a matched bank-firm relationship where there is no other bank-firm matching occurring within the window). In 1,533 other transactions, there is more than one matched relationship within the window, but we are able to identify a dominant matched relationship. In the remaining 501 cases where more than one institution has the same number of repeated events in the window, we randomly select one of the bank-firm relationships as the matched relationship for that window. As in the case of the random assignment of unmatched bank-firm relationships, this method avoids double counting of matched observations. We test, and confirm, the robustness of our reported results to alternative random choices of bank-firm matches, and also to the alternative sampling method of using only the 2,377 unique matches in our sample.[20]

Once we identify the strongest relationship bank within the matched windows, we define another set of six indicator variables, namely *MPL*, *MPD*, *MPE*, *MSL*, *MSD*, and *MSE*, to capture the pattern of matching across transactions within the window. These variables, *MPL*, *MPD*, *MPE*, *MSL*, *MSD*, and *MSE*, equal one when the corresponding events (i.e. *PL*, *PD*, *PE*, *SL*, *SD*, and *SE*) involve the same financial institution as the one in the current event. For instance, *MPD* as well as *PD* equals one if the current loan event

[19] For an event with multiple lead bankers, it can simultaneously be part of several relationships within a window. Therefore, the approach we adopt here in defining the strongest relationship also handles the issues that arise from the events with multiple lead financial institutions.

[20] In the Appendix Tables III , we present our loan spread regressions where we restrict our samples to include only events from unmatched windows and matched windows with a *unique* bank relationship, to test whether our conclusions are sensitive to our specific approach in assigning a relationship bank to a matched window with multiple relationships. The regression results in this case are similar to what we report in the next section of the paper.

is preceded by a debt offering that is underwritten by the same bank as the current loan. Table IV provides descriptions for all twelve relationship variables defined earlier, along with the definitions of other variables used in this study.

Table II in the Appendix provides two examples for matched windows to illustrate how the relationship variables are determined. Example 1 illustrates the case where there is only one lead banker for each event in a window with multiple relationships. Example 2 in the same table illustrates the case of multiple lead bankers within a window with multiple relationships. In both examples, bank B is involved in three matched transactions compared to two transactions by bank A and one transaction by bank C. We therefore include only the observations led by bank B in the regressions based on the criteria that bank B has the highest number of repeated events within both windows. In particular, we only include the second, the fourth and the fifth events in example 1 in the regressions. Whereas, in example 2, we include all three events in the regressions but only associate these events to bank B.

Loan Regressions

The endogenous variables of interest for the loan regressions are the loan spread (all-in-spread) and the loan amount. We choose a log specification to be consistent with positivity of loan spread and quantity and to transform these variables to be closer to a normal distribution.[21] As discussed previously, we allow the loan spread and loan amount to be determined jointly in the following system of simultaneous equations, where equation (1) is the Loan Supply Equation, and equation (2) is the Loan Demand Equation.

$$LNSPREAD_i = b_0^s + b_1^s REL_i + b_2^s LEC_i + b_3^s LOC_i + b_4^s BC_i + b_5^s SUP_i + g_1 LNAMT_i + e_{1i} \quad (1)$$

[21] Our results are not sensitive to this log transformation. We obtain very similar results using the basis point spread and the dollar loan amount.

$$LNAMT_i = b_0^d + b_1^d REL_i + b_2^d LEC_i + b_3^d LOC_i + b_4^d BC_i + b_5^d DEM_i + g_2 LNSPREAD_i + e_{2i} \quad (2),$$

where:

- *LNSPREAD* is the natural log of the loan all-in-spread,
- *LNAMT* is the natural log of loan amount,
- *REL* is a vector of dummies for financing needs and relationship variables (defined above) which can interact with dummies for the type of financial institution,
- *LEC* is a vector of lender characteristics,
- *LOC* is a vector of loan characteristics,
- *BC* is a vector of borrower characteristics,
- *SUP* is a vector of loan supply shifters unrelated to loan demand, and
- *DEM* is a vector of loan demand shifters unrelated to loan supply.

Crucial to our ability to identify equations (1) and (2) as Loan Supply and Loan Demand is our ability to construct plausible measures of *SUP* and *DEM*. We include variables *PRIME* and *SUBORDINATE* in *SUP*. These variables are assumed to primarily influence loan supply terms and to be unrelated to demand. Calomiris and Pornrojnangkool (2005) and Beim (1996) document pricing premium for loans that are indexed to the prime rate (instead of other, market-based indexes, such as Libor). Loan subordination also reduces default risk to the lenders and should have negative impact on loan prices but should be relatively unrelated to loan demand.

We include two measures of lender characteristics (*LEC*) in both the Loan Supply and Loan Demand equations. These are the variables *MULTIPLELENDER*, and *LNTOTLENDING*. *MULTIPLELENDER* is an indicator variable for syndicated loan. The lead lender in a syndicated loan may have less pricing power due to the fact that other members of the syndicate may insist that the loan is priced at market terms. *LNTOTLENDER* is the log of the aggregate amount of lending made by the lead lender for a given year. This variable is a proxy for the lender's reputation and any lender size effect. We expect these two *LEC* variables to have negative impacts on the loan spread.

For Loan Demand, the variables *SALEGROWTH* and *MVE_BVE* (the ratio of the market value of equity to the book value equity) are used as proxies for growth and hence the funding needs of borrowers, which drive demand. We assume that these two variables do not influence loan pricing *beyond the default risk that has already been captured by other control variables in the system with which they may be correlated* (which are captured, inter alia, by debt ratings and leverage). If these identifying assumptions are reasonable, then the coefficients of this system can be consistently estimated using two-stage least square, where *DEM* is used to instrument *LNAMT* in equation (1) and *SUP* is used to instrument *LNSPREAD* in equation (2). Alternatively, the coefficients of these equations can potentially be estimated more efficiently by GMM. In the next section, we report the results for both the 2SLS and GMM methods, together with various specification tests for the endogeneity of *LNAMT* and *LNSPREAD*, the validity of the instruments, and the overidentification restrictions.

The other control variables used are as follows. *REL* is a vector of variables which consists of the variables *PL*, *PD*, *PE*, *SL*, *SD*, *SE*, *MPL*, *MPD*, *MPE*, *MSL*, *MSD*, *MSE*, and their interaction with the variable *IB* (a dummy variable which equals one is the lead financial institution in the event is an investment bank, and zero otherwise).

We include the following loan characteristic variables in *LOC*: *LNMATURE*, *TERMB*, *TERMBSUB*, *REVOLVER*, *STREVOLVER*, *BRIDGE*, *COMBODEAL*, *PERFPRC*, and *SECURE*, together with the following indicator variables that capture the purpose use of loan: *TAKEOVER*, *CAPRESTRUC*, *CPBACKUP*, *DEBTREPAY*, *BUYOUT*, and *WORKCAP*. Most of these are standard control variables for loan characteristics that are used successfully in previous loan pricing studies (e.g., Calomiris and Pornrojnangkool 2005). Their definitions are provided in Table IV, together with the rest of the variables used in this paper. One point worth noting is that we distinguish revolvers of less than one year from revolvers of greater than one year. Bank capital regulation requires banks to hold additional capital against undrawn revolvers with a maturity greater than one year. We thus expect *STREVOLVER* to have negative impact on loan spread in the Loan Supply Equation.

The variables included in *BC* control for the borrower characteristics that influence loan terms. *LNASSET* is used to capture the effect of borrower size. *ADJMKTLEVERAGE* is the market value measure of leverage, and is adjusted for any loan, debt, and equity transactions that have occurred since the last available financial statements, in order to better reflect the borrower's riskiness at the time of the loan event. We use the market value of equity instead of the book value of equity in the calculation of leverage. We also include dummies for S&P's long-term senior credit ratings in the regressions. Roughly one-third of our observations have no rating data. We employ an ordered Probit model to impute credit ratings for observations where no rating data are available.[22] The indicator variable *RATEFORE*, which indicates whether ratings are forecasted by the model rather than provided by the ratings agency, is included to capture any systematic difference between firms that are rated and firms that are not.

Debt Underwriting Regression

We estimate the following, non-structural regression for total debt underwriting spreads, where total spreads include management fees, underwriting fees, selling concessions, and other direct expenses related to the administration and marketing of the offering. We include these direct expenses into the definition of underwriting spreads to better reflect total costs associated with security offerings.

$$LNDSPREAD_i = b_0^D + b_1^D REL_i + b_2^D DBC_i + b_3^D DFC_i + b_4^D DIC_i + e_{3i}\,. \qquad (3)$$

LNDSPREAD is the natural log of the debt underwriting spread relative to the amount of proceeds raised, expressed in basis points of the total amount of proceeds. *REL* is defined similarly to the way it was defined in the loan regressions. *DBC* is a vector of underwriter (bank) characteristics, which is comprised of *MULTIPLEBANKER and LNTOTDEBTUNDERWRITING*. They are defined similarly to the control variables for lender characteristics (*LEC*) in the Loan Supply equation, but are specific to the debt underwriting market. *DFC* is a vector of firm characteristics, which includes the log of firm assets (*LNASSET*), a market-value measure of adjusted leverage (*ADJMKTLEVERAGE*) defined similarly to the measure used in the loan regressions, and an indicator variable for an investment grade-rated firm (*INVGRADE*).[23] Lastly, we

[22] The Appendix includes the results of the ordered probit model used in this study, together with the results from the loan spread and loan amount regressions when observations with no rating information are excluded. Our findings are robust to such exclusion.

[23] Calomiris and Himmelberg (1999) use these firm-level observable characteristics to estimate equity underwriting costs. They use these cost estimates as proxies for external financing costs and explore their impacts on the investment behavior of firms.

include debt issue characteristics in *DIC*, namely *LNMATURE, LNAMT, REPAYBANK*, *REFINDEBT*, *ACQLOB*, *MTNPROG*, *FLOAT*, *SHELFREG*, *CALLABLE*, *PUTTABLE*, *LISTED*, and *COMPBID*. Their definitions are presented in Table IV.

Equity Underwriting Regression

We employ similarly specified regressions for the equity underwriting spread, as shown below.

$$LNESPREAD_i = b_0^E + b_1^E REL_i + b_2^E EBC_i + b_3^E EFC_i + b_4^E EIC_i + e_{3i}, \qquad (4)$$

LNESPREAD is the log of the equity underwriting spread. *REL* is the vector of financing needs and relationship variables defined previously. *EBC* is defined similarly to *DBC* in the debt regression but is specific to the equity underwriting market. We include *LNASSET*, *ADJMKTLEVERAGE*, *RATED*, *INVGRADE, LNMVE, and VOLATILITY* in the vector of firm characteristics *EFC*. Volatility of equity is calculated from the previous 250-day daily equity returns, looking back from the offering date. The issue characteristics (e.g., *LNAMT*, *REPAYBANK, REFINDEBT*, *ACQLOB* and *SHELFREG*) are included in the vector of issue characteristics (*EIC*).

4. Empirical Results

Loan Supply Specifications

Table VI presents the estimates of the Loan Supply equation (1). In this specification, we postulate that *LNSPREAD* and *LNAMT* are determined simultaneously, as described in the previous section. Model A presents two-stage least squares estimates of *LNSPREAD* regression in which financing needs and relationship variables (*REL*) do not interact with the investment bank indicator variable (*IB*). Model B allows *REL* to interact with *IB*. Using *SALEGROWTH* and *MVE_BVE* as instruments for *LNAMT* in this regression seems to work well. At the bottom of the table, we display results for tests of the significance of these instruments in the first-stage regression of *LNAMT* on all exogenous variables. Individually and jointly, these instruments are correlated with *LNAMT*. We also implement a Hausman (1978) procedure to test the null hypothesis that instruments are exogenous. In doing so, we regress the residual from the second-stage regression on the list of all exogenous variables and construct a test statistics (N times the R-squared from this residual regression, where N is number of observations in the regression). The test statistic has an asymptotic distribution of Chi-Square with 1 degree of freedom (the number of instruments minus endogenous variables). As shown in the overidentification tests in the table, the value of the test statistic is 0.37 for model A and 0.26 for model B, indicating that one cannot reject the null of instruments exogeneity.

In addition, we utilize the instruments to test for the endogeneity of *LNAMT* in the spread regression. If *LNAMT* is exogenous in the spread equation, then ordinary least squares and two-stage least squares estimates of all coefficients should differ only by sampling error. The test is implemented by first regressing *LNAMT* on all exogenous variables to obtain its residual. Then, we add the residuals from this regression to the spread regression (1) to obtain the OLS estimate. The t-statistics of the residual term in this augmented spread regression can be used as a test statistics for the null hypothesis that *LNAMT* is exogenous. Our t statistic has a value of -12.77 for model A, and -11.51 for model B. Thus, we clearly reject the null hypothesis that *LNAMT* is exogenous.

In our sample, it is interesting to see how the coefficient of *LNAMT* from the two-stage least squares estimate differs from the coefficient from the ordinary least squares estimate. We include the ordinary least square estimates of equation (1) in the Appendix

(Appendix Table IV). The coefficient for *LNAMT* in the ordinary least squares regression is significantly *negative* whereas the coefficient for *LNAMT* in the two-stage least squares regression is *positive* and significant. Since we interpret our spread regression as a Loan Supply equation (by including supply shifter variables (*SUP*) in the equation), we expect an upward sloping supply curve (a positive coefficient for *LNAMT*). The ordinary least squares estimator clearly is not consistent and suffers from simultaneity bias. This result therefore confirms the validity of our approach in modeling Loan Supply and Loan Demand as a simultaneous system of equations.

The coefficients for most variables in the Loan Supply equation are of the expected signs and significant. Having multiple lenders (*MULTIPLELENDER*) participating in the syndication significantly reduces the costs of borrowing. Larger and more diversified lenders (*LNTOTLENDING*) can lend to borrowers at lower costs. Loan characteristics also affect loan pricing in expected ways. In tranch B term loans (*TERMB*), where lenders carry lower seniority than other lenders in the same term loan, loan pricing is higher. The pricing premium is even greater for loans in lower trenches (*TERMBSUB*). Revolvers carry lower spreads than term loans (tranch A) and short-term revolvers have even greater discounts, perhaps reflecting the lower regulatory capital required for short-term revolvers. The indicator variable *SECURE* is significantly positive, as found in previous studies. This reflects unobserved (higher) riskiness of borrowers that borrow in the form of secured loans. In addition, borrowers are charged higher rates when term and revolving loans are packaged together in one deal (*COMBODEAL*). We document a substantial *PRIME* premium in our sample, as found in Beim (1996). The coefficient for *SUBORDINATE* is also significant and positive in our sample. In our sample, the discount for “performance pricing” of loans is significant but smaller than the discount reported in prior studies (e.g., Beatty and Weber 2000). We also include time and industry dummies, which are omitted from the table.

Table VII presents a GMM estimator for the Loan Supply equation, where we utilize the cross-equation correlation of the error terms in the estimation and allow for a general form of heteroskedasticity. The GMM estimator is asymptotically more efficient if the model is correctly specified. The results are remarkably similar.

Effects of the Patterns of Financing Needs and Relationships on Loan Prices

As we discussed in our review of the literature, one potential shortcoming of existing studies is their insufficient controls for heterogeneity among borrowers. In particular, unobserved heterogeneity may drive patterns of borrowers’ financing needs, which in turn may influence loan pricing, and may be correlated with relationship indicator variables. Thus, omitting financing pattern variables from the regressions can make estimates inconsistent and provide misleading estimates of the effects of bundling on loan pricing. In our regressions, we include variables *PL*, *PD*, *PE*, *SL*, *SD*, and *SE* as proxies for unobservable heterogeneity.

We find several consistent results across our specifications, which indicate the importance of controlling for financing patterns. First, loans that occur around the time of debt offerings receive pricing discounts from both universal and investment banks, regardless of whether the lender and underwriter are matched (the coefficients of *PD* and *SD* are negative). Interestingly, we do not find the same result for loans around the time of equity offerings. This finding is consistent with a “road-show” effect, in which information regarding creditworthiness of borrowers is transmitted to the market surrounding a debt offering in a way that reduces information gathering costs for the surrounding loans. Second, a loan that is followed by another loan (*SL*) is priced slightly higher than a single loan. This occurs regardless of whether the loans are matched or not. Third, investment banks price loans significantly higher than universal banks, in general (the coefficient for *IB* is positive and significant). Investment banks' loan spreads are about 8% higher in model A, ceteris paribus, and the effect is even larger (11%) in model B, where we allow the *IB* interactions. This finding indicates that investment banks suffer a basic cost disadvantage relative to commercial banks in originating loans. It is possible that commercial banks' special access to the payment system reduces their costs of originating loans.[24]

Turning to the effects of bundling lending and underwriting, our results for matched loans (whose lenders also underwrite other transactions within the same financing windows) differ from the results of existing studies. Matched loans, whose lenders provide other loans or underwrite other *debt* issues within the same financing windows, are priced similarly to unmatched loans, ceteris paribus. That finding is consistent with the study of Fraser, Hebb and MacKinnon for the matching of loans and debt underwritings. For loans that are matched to *equity* underwritings, we find that matching has differing effects on loan pricing depending on the sequencing of the transactions and the identities of the lenders. If matched loans occur before equity underwritings, both universal banks and investment banks price these loans significantly

[24] At least two possible influences may be important. First, the payment system may afford special information to banks about borrowers by virtue of the fact that banks can monitor debits and credits flowing in and out of the firm's accounts. A second possibility, which applies to revolving lines of credit, is that linking the line with a checking account may economize on transaction costs of accessing the line.

higher than their unmatched counterparts. However, if loans are granted after matched equity offerings, then there is a loan pricing *discount* that *only* investment banks provide.

Drucker and Puri (2005) utilize different econometric techniques in their analysis and report evidence that *only* universal banks (not investment banks) provide discounts for loans to the borrowers who also use their equity underwriting services *around* the time of loans. They interpret their findings to be consistent with the existence of economies of scope between the joint production of loans and underwritings, whose benefits are passed on to borrowers in the form of a loan pricing discount. In their study, however, they do not include our controls, model lending structurally, or consider differences in loan pricing that result from differences in the sequences of loans and equity offerings. Our results indicate that such distinctions result in qualitative differences in estimated effects of bundling.

Our finding of a loan pricing *premium* preceding matched equity underwritings does not support the notion that universal banks underprice their loans to win future security underwriting business. Quite the opposite. Perhaps underwriters utilize their ongoing equity underwriting relationship to *over*-price loans that immediately precede equity offerings. Typically, equity underwritings are lengthy and complex processes. It is not uncommon for a successful equity underwriting to take more than one year from inception to completion. Therefore, it is possible that matched preceding loans are granted after the firm has decided to underwrite equity. Because the debt underwriting process is less complex and debt offerings are substitutes for loan, it may be more difficult for debt underwriters to leverage their underwriting relationships to increase their spreads in the lending market. Our findings suggest that illegal tying is not prevalent, since a necessary condition for tying is the discounting of loans in anticipation of underwritings – a phenomenon not apparent in the data.

Our finding that loan pricing discounts are offered only by investment banks, and only when loans are preceded by matched equity underwritings, is consistent with the notion that investment banks suffer cost disadvantages relative to commercial banks in providing loans (i.e., the positive coefficient for the *IB* indicator). Investment banks may compete with universal banks in the loan market by providing "rebates" through loan pricing discounts only for loans that are closed after matched equity offerings. In this regard, it is interesting to note that the coefficients on IB (0.11) and IB_MPE (-0.19) are of roughly similar magnitude.

It is clear from our findings thus far that loan pricing in the presence of an underwriting relationship does not merely reflect the physical scope economies between lending and underwriting, as previous studies have posited. Banks also utilize loan pricing in a *strategic* way to extract value from existing relationship with firms (by selectively charging "premiums"), and also as a tool to compete with competitors (by selectively offering "rebates").

Universal banks seem to enjoy cost advantages in providing loans, in general. This may explain universal banks' growing share of the underwriting market. So long as there are either expected savings to customers from bundling (which can take the form of initial discounts to attract clients, partly offset by rent extraction in later years through the charging of loan premia, as in Rajan 1922, or better price performance on securities offerings, or physical, non-pecuniary savings of transaction costs to customers from bundling), and as long as universal banks can perform underwriting services as effectively as investment banks, then universal banks should attract a growing share of the underwriting and lending markets. Given the fact that most universal banks acquired existing investment banking franchises to participate in the underwriting market, there is no obvious reason to presume that universal banks are not able to underwrite securities as effectively as investment banks. Below, we investigate that question empirically.

We also report Loan Supply estimates using GMM estimators. The results are similar and are presented in Table VII. Our instruments pass a GMM overidentification test, which confirms our choice of instruments.

Loan Demand Specifications

Two-stage least squares estimates of the Loan Demand equation are presented in models C to E in Table VI. The sign of *LNSPREAD* is negative and significant, confirming the demand interpretation of the equation. Our instruments for *LNSPREAD* also work well. In the first-stage regression, *PRIME* and *SUBORDINATE* are very significant instruments in explaining *LNSPREAD*, as shown at the bottom of the table. In addition, we can not reject the null hypothesis that our instruments are exogenous in the overidentification test, which validates our choices of instruments.

Our demand shifter variables (*SALEGROWTH* and *MVE_BVE*) are both positive and significant. A higher growth firm has higher loan demand. Borrowers with higher loan demand use larger lenders and often use loan syndication. Borrowers who use lower tranch loans (*TERMB* and *TERMBSUB*) tend to have higher demand for funds. Revolvers typically are associated with larger loan size than standard term loans. Borrowers who are willing to have their loans secured tend to have larger demand for credit than those who do not secure their loans. Borrowers tend to demand larger loans when the loans are for a specific purpose such as a takeover, a bridge loan, or a debt repayment. Borrowers with better credit ratings tend to have less demand for credit, and more leveraged borrowers tend to have higher demand for credit. We include time and industry dummies, which are omitted from the table. Results are similar using a GMM estimator and the instruments for *LNSPREAD* in the Loan Demand regression pass GMM overidentification tests.

Effects of Patterns of Financing Needs and Relationships on Loan Demand

For the variables that capture patterns of financial need, we find that firms that recently issued debts (*PD*) have lower demand for loans, and that firms that recently issued equities or plan to issue equities (*PE* or *SE*) have higher demand for loans regardless of whether the loans are matched.

For relationship variables, we observe consistently negative signs for the coefficients of matched loans regardless of which particular transactions are matched with these loans (i.e., negative signs for *MPL*, *MPD*, *MPE*, *MSL*, *MSD*, and *MSE*). In model E, we restrict the model by requiring that all relationship dummies are equal (as shown in *MATCH* and *IB_MATCH* variables at the bottom of the table). The result indicates that bundling, in general, is associated with lower loan demand.[25]

Sub-Samples Analysis

Table VIII presents the GMM estimates of spread regressions broken down by time and borrower sales.[26] The evidence of a loan pricing premium on loans that precede matched equity transactions holds when we split our sample pre- and post-1998, but

---

[25] This finding may reflect another valuable aspect of banking relationships. Borrowers who maintain close relationships with their banks (as reflected in matched transactions) may have access to implicit "credit lines" from their relationship banks. They may consequently have less need for large explicit credit lines or large loans, which could result in substantial interest savings for borrowers through time. This result holds for both universal banks and investment banks.

[26] The results are similar for the two-stage least squares estimators.

results are more significant post-1998, which corresponds to the period when the Glass-Steagall Act was no longer in effect. This pricing premium applies across the borrower size spectrum, although the coefficients for *MSE* are not significant for the smallest size borrowers (with less than $250 million in annual sales) and the largest size borrowers (with more than $10 billion in annual sales). This finding is consistent with our previous interpretation that the *MSE* premium reflects bank quasi rent extraction by virtue of their relationships. In our sample, there are few *MSE* transactions for the smallest size category of borrowers, which can explain the larger standard errors for that coefficient. For the largest borrowers, we hypothesize that the underwriting market is highly competitive (i.e., lenders lack significant private information about these borrowers) so that banks seeking to exploit their relationships to extract quasi rents (as in Rajan 1992) would fail because they have no market power in the lending market.

The sign for the coefficients of *IB*MPE* is consistently negative pre- and post-1998 and across borrower sizes. However, the coefficients are significant only for the post-1998 period and for large borrowers (those with annual sales more than $1 billion). This finding is also consistent with the hypothesis that investment banks suffer cost disadvantages relative to universal banks in providing loans, and therefore, are forced to compete in the loan market by providing “rebates” of their underwriting fees in the form of pricing discounts for loans that follow equity offerings. Since this “rebate” is costly, it is logical for them to offer it only when they have to do so (i.e., on deals where revenue is large, and for which the competition from universal banks is strongest – namely loans to large borrowers). Other regression results from the sub-samples are similar to those for the whole sample, and thus we do not report them.

Debt Spread Regressions

Both our debt and equity underwriting spread regressions, shown in Table IX, have high explanatory power, as is evident from the adjusted R-squareds of 0.78 and 0.74 for the debt and equity underwriting spread regressions, respectively. Our control variables in the debt underwriting spread regressions shown in Table IX have the expected signs and most are significant. Large underwriters (*LNTOTDEBTUNDERWRITING*) appear to be able to underwrite debt issues more efficiently and at lower cost, although it is also possible that the underwriter size effect reflects unobserved heterogeneity of clients (riskier, and therefore, hard-to-underwrite firms may be attracted to smaller underwriters). Larger firm size (*LNASSET*) is associated with reduced underwriting costs for debt issuers. Higher leverage (*ADJMKTLEVERAGE*) is associated with higher underwriting costs, while having long-term debt rated as investment grade (*INVGRADE*) reduces underwriting costs. In addition, the underwriting costs are lower when the proceeds of the debt offerings are used for existing debt repayments or refinancings (*REPAYBANK* or *REFINDEBT*). Having floating interest debt (*FLOAT*), being registered in an MTN program (*MTNPROG*), or using a competitive bidding process (*COMPBID*) for selecting underwriters reduces underwriting costs. Finally, more complex debt structures such as callable and puttable features (*CALLABLE* and *PUTTABLE*) increase underwriting costs for the issues.

With respect to bundling, we find that debt offering transactions that are matched with loans are associated with higher spreads than unmatched counterparts (i.e., we find significantly positive coefficients for *MPL* and *MSL*) for both universal and investment banks. This finding is consistent with the hypothesis that relationship banks can extract value from their relationships. In this context, banks extract value from relationships in the form of higher underwriting fees for matched loan and debt transactions. Recall the results from the loan regressions, where we found significant discounts for loans surrounding debt offerings due to a "road show" effect, whether these loans are matched or not. Therefore, for matched debt and loan transactions, borrowers pay less of an interest spread for their loans but the discounts are offset to some extent by higher debt underwriting costs. In addition, we find that issuers pay less when debt offerings are done consecutively, which we see as a variation on the "road show" effect. Interestingly, we also find that, in general, it costs more to use specialized investment banks than universal banks to underwrite debts.

Equity Spread Regressions

As in the debt regressions, we find that larger underwriters underwrite equity at lower costs (*LNTOTEQUNDERWRITING*). Using joint underwriters (*MULTIPLEBANKER*) increases total underwriting costs. We also find that market capitalization (*LNMVE*), asset size (*LNASSET*), and the size of the equity offering (*LNAMT*) are associated with significantly reduced underwriting costs, whereas leverage (*ADJMKTLEVERAGE*) and equity volatility (*VOLATILITY*) are associated with higher underwriting costs for equity offerings. The negative coefficient for *SHELFREG* and the positive coefficient for *ACQLOB* are similar to those in the debt spread regressions.

With respect to the relationship variables, we find two results that are similar to the debt underwriting regressions. First, investment banks in general underwrite equity offerings at higher costs than universal banks, ceteris paribus (i.e., there is a significantly positive coefficient for *IB*). Second, when there are matched loans surrounding equity offerings, both universal banks and investment banks underwrite the issues at higher costs than unmatched transactions. This finding together with the finding of a positive coefficient for *MSE* in the loan spread regressions provide consistent evidence that both universal and investment banks are able to extract value from their banking relationships through higher loan and underwriting spreads in the matched windows in which loans are followed by equity offerings. (Recall that we find a significant negative coefficient for *IB*MPE* in the loan spread regressions.) It appears that investment banks provide a loan pricing "rebate" after they capture an underwriting fee premium for matched transactions.

5. Conclusions

We investigate how the formation of banking relationships, and the bundling of financial services that occurs within those relationships, affect the pricing of loans and the underwriting costs of issuing securities. In particular, we investigate the alleged practice of loan under-pricing (and potentially, illegal tying) as tools for universal banks to compete more effectively as underwriters. In doing so, we revisit the existing literature that uses micro-level loan and underwriting data to investigate the costs and benefits of the joint production of loans and security underwritings within the context of relationship banking.

Our research methodology addresses several shortcomings in current studies. First, we incorporate important control variables into the analysis of the effects of relationships on pricing, and in particular, we consider the pricing of financial transactions within the context of the sequential patterns of financing transactions undertaken by firms. Firm and deal characteristics, as well as the sequencing of transactions, turn out to be important sources of firm heterogeneity, and incorporating these effects has significant consequences for measuring the effects of relationships on pricing. We construct a dataset that captures nearly complete financing transaction histories for 7,315 firms comprising loan, debt, and equity transactions for the period of 1992 to 2002. Second, we explicitly identify the effects of bundling on loan *supply* by imposing identifying restrictions on supply and demand that allow us to estimate loan supply and loan demand functions. Third, we consider the pricing of several financial services supplied within financial relationships, including loan pricing, debt underwriting costs, and equity underwriting costs.

All of our regressions have high explanatory power. We report several interesting findings. First, our findings contradict other studies that had found evidence that universal banks under-price loans to gain an in-road into the underwriting market. Our findings, therefore, also imply an absence of illegal loan tying.

Second, we find evidence of strategic aspects of the pricing of loans and underwriting services. Banks are able to use their valuable relationships to *over*-price loans (as predicted by Rajan 1992) that precede equity underwritings. We also find pricing premiums for both debt and equity underwriting services that are matched with loans within the same financing windows. Investment banks have different pricing strategies than universal banks, reflecting the fact that investment banks apparently operate at a cost disadvantage with respect to universal banks. That is, controlling for other differences, investment banks price loans, and debt and equity underwriting services, higher than universal banks. The cost disadvantage of investment banks may explain why they price bundled transactions somewhat differently from universal banks, too. Investment banks compete with universal banks in the loan market by providing loan pricing discounts as "rebates" to borrowers who had employed them in preceding equity underwriting transactions.

Our findings that banks appear to be able to extract quasi rents from their relationships (charge premium on loans and underwritings) might seem to imply that relationships are harmful to bank customers, but that is not the case. Unless there are substantial benefits accruing to the borrowers from forming relationships and choosing to bundle transactions, relationship banks should not be able to extract quasi rents from their relationships through pricing premiums in bundled transactions. In the Rajan (1992) model, customers freely choose and benefit from relationship formation, and receive up-front concessions early on in their banking relationships which compensate for the quasi rents banks later extract. Furthermore, relationships can entail benefits for customers other than initial price discounts on loans and underwritings at the time of relationship formation. One possibility is that bundling economizes on transaction costs (saved "face time," for example). Another possibility is that richer banking relationships increase the prices of debt and equity securities underwritten by bankers. Still another possibility is that relationships may reduce the need for some bank services. Our results from the estimation of Loan Demand suggests that bundling may reduce the demand for loans, possibly because stronger relationships entail an implicit "credit line," which substitutes for an explicit one. That reduction in the demand for credit could result in substantial interest savings.

A more fundamental implication of our findings about the strategic pricing of financial services is that empirical models of loan pricing and underwriting need to take bank strategies into account, and not presume that physical scope economies will necessarily be reflected in pricing decisions. Observed prices do not merely reflect the cost functions of banks.

Third, we find evidence of “road show” effects for debt underwritings. The similarity between the information produced in debt underwriting and loans seems to result in pricing discounts for loans that occur near debt issues, and this result holds for both universal and investment banks, whether the loans are bundled with the offerings (matched with the same bank) or not. In addition, and similarly, we find that consecutive debt offering have lower underwriting costs than stand alone debt offerings.

From the conclusions of this study, several questions remain and should be addressed by further research. In particular, more investigation is warranted of the possible advantages that customers receive from bundling, which could take the form of improved prices on debt and equity securities, transaction costs savings that accompany bundling, and possible savings from implicit “credit lines.” Second, further study is needed to understand the relative efficiency of universal banks as compared with investment banks – that is, why do investment banks systematically charge higher interest rates on loans and higher fees for their underwriting services? The key difference between the two intermediaries is the access to deposits and the payment system enjoyed by commercial banks (which may provide favorable information processing capabilities about borrowers, and lower transaction costs for providing revolving lines of credit), as well as their access to the government safety net (i.e., deposit insurance, and access to Fed overdrafts and the discount window).

Table I

Summary of DealScan Loan Sample

This table presents the number and the dollar volume of loans to non-financial, non-regulated, and non-governmental borrowers in the U.S. from Loan Pricing Corporation's DealScan database. Specifically, we exclude all borrowers with first-digit SIC code 6 and 9 and highly regulated industries with first 2-digit SIC code 43, 45 and 49. In Panel A, the data are broken down by various types of lending financial institutions for the period from 1992 to 2002. Panel B classifies loans by type of loans. Panel C classifies loans by distribution method. Only loans from the borrowers that can be matched to financial data from Compustat are included in this table.

Panel A: Loans classified by type of lender													
Type of lenders	Data items	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
Banks Only	Number of Loans(% of Total)	93%	95%	95%	94%	92%	88%	87%	83%	85%	80%	83%	88%
	Dollar Volumn(% of Total)	88%	95%	96%	81%	89%	83%	83%	70%	70%	66%	71%	78%
IBs Only	Number of Loans(% of Total)	1%	1%	1%	1%	1%	1%	1%	1%	2%	1%	1%	1%
	Dollar Volumn(% of Total)	1%	3%	1%	2%	2%	1%	1%	1%	2%	1%	0%	1%
Joint Banks & IBs	Number of Loans(% of Total)	0%	0%	0%	2%	3%	6%	7%	11%	9%	13%	12%	7%
	Dollar Volumn(% of Total)	8%	0%	2%	17%	9%	15%	15%	28%	28%	32%	28%	19%
Other Lenders	Number of Loans(% of Total)	5%	4%	4%	3%	4%	4%	5%	5%	4%	6%	4%	4%
	Dollar Volumn(% of Total)	3%	2%	1%	1%	1%	1%	1%	1%	1%	2%	1%	1%
Panel B: Loans classified by loan type													
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
Bridge Loans	Number of Loans(% of Total)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	1%
	Dollar Volumn(% of Total)	1%	3%	0%	2%	1%	2%	4%	4%	3%	6%	6%	3%
364 day Facility	Number of Loans(% of Total)	1%	4%	7%	6%	4%	6%	9%	12%	16%	17%	18%	10%
	Dollar Volumn(% of Total)	12%	15%	21%	17%	11%	14%	28%	36%	42%	36%	44%	28%
Letter of Credit	Number of Loans(% of Total)	4%	4%	3%	2%	2%	2%	1%	1%	1%	1%	1%	2%
	Dollar Volumn(% of Total)	1%	1%	1%	1%	0%	2%	2%	2%	2%	2%	0%	1%
Lease	Number of Loans(% of Total)	0%	0%	0%	0%	1%	1%	1%	1%	2%	2%	1%	1%
	Dollar Volumn(% of Total)	0%	0%	0%	0%	0%	0%	1%	0%	1%	1%	0%	0%
Other	Number of Loans(% of Total)	5%	4%	3%	2%	1%	1%	1%	4%	3%	3%	2%	3%
	Dollar Volumn(% of Total)	1%	1%	1%	1%	1%	1%	1%	2%	2%	1%	1%	1%
Revolver	Number of Loans(% of Total)	67%	66%	65%	69%	71%	67%	61%	52%	51%	52%	50%	60%
	Dollar Volumn(% of Total)	72%	71%	69%	73%	78%	71%	49%	40%	38%	44%	35%	55%
Term Loan	Number of Loans(% of Total)	22%	21%	21%	19%	21%	22%	26%	29%	26%	23%	26%	24%
	Dollar Volumn(% of Total)	14%	9%	9%	7%	8%	9%	16%	16%	12%	10%	13%	11%
Panel C: Loans classified by distributiion method													
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
Sole Lender	Number of Loans(% of Total)	42%	36%	26%	18%	24%	23%	19%	15%	7%	8%	7%	18%
	Dollar Volumn(% of Total)	3%	2%	1%	1%	1%	1%	1%	0%	0%	1%	0%	1%
Syndication	Number of Loans(% of Total)	58%	64%	74%	82%	76%	77%	81%	85%	93%	92%	93%	82%
	Dollar Volumn(% of Total)	97%	98%	99%	99%	99%	99%	99%	100%	100%	99%	100%	99%
Total	**Number of Loans**	**965**	**1,145**	**1,358**	**1,361**	**1,738**	**1,955**	**1,906**	**1,934**	**1,869**	**1,798**	**1,548**	**17,577**
	Dollar Volumn (Billion)	**113**	**175**	**248**	**310**	**337**	**437**	**369**	**415**	**464**	**482**	**395**	**3,744**

Table II

Summary of SDC Public Offering Sample

This table presents the number and the dollar volume of debt and public equity offerings (both IPO and SEO) by non-financial, non-regulated, and non-governmental borrowers in the U.S. from Securities Data Corporation's underwriting database. Specifically, we exclude all borrowers with first-digit SIC code 6 and 9 and highly regulated industries with the first 2-digit SIC code 43, 45 and 49. The data are broken down by security type and types of underwriting financial institutions for the period 1992- 2002.

Security	Underwriter	Data items	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
Debt	Banks Only	Number of Offering(% of Total)	10%	11%	13%	20%	22%	16%	34%	33%	38%	47%	58%	26%
		Dollar Volumn(% of Total)	7%	7%	7%	12%	16%	15%	24%	31%	34%	48%	57%	28%
	IBs Only	Number of Offering(% of Total)	90%	89%	87%	80%	78%	84%	66%	66%	60%	49%	35%	72%
		Dollar Volumn(% of Total)	93%	93%	93%	88%	84%	85%	74%	67%	63%	44%	28%	68%
	Joint Banks & IBs	Number of Offering(% of Total)	0%	0%	0%	0%	0%	0%	1%	1%	2%	4%	8%	1%
		Dollar Volumn(% of Total)	0%	0%	0%	0%	0%	0%	2%	2%	3%	7%	15%	4%
	Debt Total	Number of Offering	417	511	315	397	565	657	749	403	308	401	340	5,063
		Dollar Volumn (Billion)	70	84	44	58	78	84	114	114	100	169	122	1,039
Equity	Banks Only	Number of Offering(% of Total)	0%	1%	3%	3%	5%	12%	29%	27%	33%	30%	30%	13%
		Dollar Volumn(% of Total)	0%	2%	4%	3%	3%	8%	26%	22%	20%	18%	20%	13%
	IBs Only	Number of Offering(% of Total)	100%	99%	97%	97%	95%	87%	70%	72%	62%	61%	64%	86%
		Dollar Volumn(% of Total)	100%	98%	96%	97%	96%	90%	72%	75%	69%	62%	72%	82%
	Joint Banks & IBs	Number of Offering(% of Total)	0%	0%	0%	0%	0%	0%	1%	2%	5%	8%	6%	1%
		Dollar Volumn(% of Total)	0%	0%	0%	0%	1%	1%	2%	3%	10%	20%	8%	5%
	Equity Total	Number of Offering	663	884	705	820	1,141	858	531	743	649	310	295	7,599
		Dollar Volumn (Billion)	36	48	35	56	81	66	64	111	125	65	49	736

Table III

Classification of Financing Windows

This table presents the number of financing windows constructed from the history of financing activities of 7,315 firms during 1992 and 2003. The history of financing activities for each firms is assembled from loan and underwriting data from DealScan and Loan Pricing Corporation (LPC) databases detailed in table I and II. Loans in DealScan are matched with Compustat using ticker symbol as well as manual name matching. The underwriting deals in SDC Platinum are matched with loans from LPC using CUSIP. Then financing history of a firm is constructed by sorting all loans and underwriting deals by date for each matched GVKEY variable in Compustat. A financing windows is defined as a cluster of events that are at most one year apart and for which there are no other financing events happening within one year before and after the window. By this definition, financing windows can have variable length with different number of events in a window. The table thus classified windows by the number of events that contain in them. Furthermore, we classify windows according to the sequence of events within the window defined as follows:

Type of Events	Number of events in window					
in the Windows	1	2	3	4	>4	Total
Loan only	4,658	808	226	74	52	5,818
Debt only	500	73	23	4	20	620
Equity only	3,700	377	32	4		4,113
Loan and Debt		138	84	61	185	468
Loan and Equity		661	345	162	155	1,323
Debt and Equity		98	29	13	14	154
Loan, Debt, and Equity			26	32	134	192
Total	8,858	2,155	765	350	560	12,688
Average Length of Windows in Months		15	30	43	84	31

Table IV

Definition of Variables that Capture Firm Financing and Bank Relationship Patterns

Each transaction in a financing window defines an event. An event can be loan, debt offering, or equity offering. This table provides the definitions of dummy variables used to capture firm financing and bank relationship patterns. Table A1 in appendix provides an illustrative example of how the value of these dummy variables are assigned for a given event/transaction in a financing window.

Variable Names (abb. For)		Firm Financing and Bank Relationship Patterns
PL	(has Preceding Loan)	equals one if current event is preceded by at least one loan event in the same financing window.
PD	(has Preceding Debt)	equals one if current event is preceded by at least one debt event in the same financing window.
PE	(has Preceding Equity)	equals one if current event is preceded by at least one equity event in the same financing window.
MPL	(has Matched Preceding Loan)	equals one if current event is preceded by at least one loan event in the same financing window and the preceding loan was from the same financial institution that is in the current event.
MPD	(has Matched Preceding Debt)	equals one if current event is preceded by at least one debt event in the same financing window and the preceding offering was underwritted by the same financial institution that is in the current event.
MPE	(has Matched Preceding Equity)	equals one if current event is preceded by at least one equity event in the same financing window and the preceding offering was underwritted by the same financial institution that is in the current event.
SL	(has Subsequent Loan)	equals one if current event is followed by at least one loan event in the same financing window.
SD	(has Subsequent Debt)	equals one if current event is followed by at least one debt event in the same financing window.
SE	(has Subsequent Eq)	equals one if current event is followed by at least one equity event in the same financing window.
MSL	(has Matched Subsequent Loan)	equals one if current event is followed by at least one loan event in the same financing window and the subsequent loan is from the same financial institution that is in the current event.
MSD	(has Matched Subsequent Debt)	equals one if current event is followed by at least one debt event in the same financing window and the subsequent offering is underwritten by the same financial institution that is in the current event.
MSE	(has Matched Subsequent Equity)	equals one if current event is followed by at least one equity event in the same financing window and the subsequent offering was underwritten by the same financial institution that is in the current event.
		Lenders or underwriters control variables
IB		equals one if the lender or runderwriter is investment bank
LNTOTLENDING		log of total dollar loan made by this lender last year
LNTOTDEBTUNDERWRITING		log of total debt underwritten by this underwriter last year
LNTOTEQUNDERWRITING		log of total equity underwritten by this underwriter last year
MULTIPLEBANKER		equals one if the offering is joint underwritten by more than one underwriter
MULTIPLELENDER		equals one if loan is a syndicated loan with multiple lenders with agent titles
SIC2DEBTUNDERWRITERSHARE		% share of debt offering done by this underwriter for companies with the same 2-digit SIC code
SIC2EQUNDERWRITERSHARE		% share of eq offering done by this underwriter for companies with the same 2-digit SIC code
SIC2LENDINGSHARE		% share of loans made by this lender to companies with the same 2-digit SIC code

Table IV (continue)

Definition of Variables that Capture Firm Financing and Bank Relationship Patterns

Loans or issue characteristics	
AAA,…,B	are dummies for S&P senior debt credit ratings
LNAMT	log of principle amount of loan or offering
ACQLOB	equals one if loan is acquisition line of credit
BRIDGE	equals one if loan is bridge loan
CALLABLE	equals one if debt issue is callable
COMBODEAL	equals one if multiple types of loans (eg term and revolver) are offered at the same time
COMPBID	equals one if the underwriting fee is set by competitive bidding process
FLOAT	equals one if debt issue has floating rate
LISTED	equals one if company stocks are traded in the exchange
LNMATURE	log of the number of days to maturity of loan or debt offering
LTREVOLVER	equals one if loan is revolver loan with maturity more than 1 year
MTNPROG	equals one if debt issue is a part of Medium-term Note program
PUTTABLE	equals one if debt issue is puttable
REFINDEBT	equals one if equity offering is for refinancing outstanding debt
REPAYBANK	equals one if equity or debt offering is used to repay bank loan
SECURE	equals one if loan is secured by assets
SHELFREG	equals one if debt or equity offering has been shelf-registered
SUBORDINATE	equals one if loan is a subordinated loan
TERMB	equals one if loan is tranch B term loan
TERMBSUB	equals one if loan is term loan with tranch lower than B
PERFPRC	equals one if loan has performance pricing provision (i.e. pricing grid)
Issuer/lenders control variables	
ADJMKTLEVERAGE	(book debt+new debt+new loans)/(book debt+new debt+new loans+market value equity+new equity) where new transactioins are transactions that are yet to be reflected in latest accounting data
CURASSET_A	current asssets/total assets
CURRATIO	current ratio
FWC_K	financial working capital/fixed capital
INT_DEBT	interest expenses/total debts
INTCOVER	interest coverage ratio
INVGRADE	equals one if issuer's long-term senior debt is rated BBB or above
INVTURNC	sales/average cost of good sold
INVTURNS	sales/average inventories
K_A	properties, plant & equipment/total assets
LNAMT	log of principle amount of loan or offering
LNASSET	log of total assets
LNMVE	log of market value of equity
QUICKRATIO	quick ratio
RATED	equals one if the issuer has credit rating
RATINGFORECAST	equals one for borrower with no credit rating but uses forecasted rating in loan regressions
ROA	return on asset
ROE	return on equity
SALEGROWTH	growth of sales over the past year
MVE_BVE	market value of equity/book value of equity
STD_A	short-term debts/total assets
STDEBTOVERDEBT	short-term debts/total debts
STREVOLVER	equals one if loan is revolver loan with maturity equal or less than 1 year
VOL	equity volatility calculated using last year daily equity returns

Table V
Summary Statistics of Exogenous Variables Used in Regressions

PANEL A: VARIABLES USED IN REGRESSIONS						
Pricing Variables	25th pct	Median	75th pct	Mean	Std	Count
LNSPREAD (loan)	3.9120	4.8283	5.4702	4.6322	0.9455	21579
Loan all-in-spread (bps)	50	125	238	150	120	21579
LNTOTSPREAD (debt)	4.2665	4.5312	5.0761	4.6859	0.7037	2132
Debt total spread (bps of proceed amt)	71	93	160	143	133	2132
LNTOTSPREAD (equity)	6.3120	6.5048	6.6898	6.5206	0.3801	1864
Equity total spread (bps of proceed amt)	551	668	804	737	411	1864
Loan Regressions	25th pct	Median	75th pct	Mean	Std	Count
ADJMKTLEVERAGE	0.2150	0.3540	0.5045	0.3690	0.1932	21579
LNAMT	18.3153	19.3370	20.2533	19.1496	1.6906	21579
LNASSET	19.9285	21.2252	22.5884	21.2093	1.9557	21579
LNMATURE	5.8972	6.9994	7.5099	6.8425	0.8046	21579
LNTOTLENDING	23.6742	24.8222	25.5747	24.3186	1.9696	21579
MVE_BVE	1.3557	2.2643	3.8354	3.2726	1.8101	21579
SALEGROWTH	0.0117	0.0909	0.2291	0.1519	0.3364	21579
SALES (MILLION)	417	1568	5543	6532	14842	21579
SIC2LENDINGSHARE	0.0189	0.0487	0.1003	0.0744	0.0898	21579
Debt Underwriting Regressions	25th pct	Median	75th pct	Mean	Std	Count
ADJMKTLEVERAGE	0.1782	0.2733	0.4101	0.3060	0.1666	2132
LNAMT	18.8261	19.3370	20.0301	19.4293	1.0198	2132
LNASSET	21.0703	22.2074	23.3306	22.1268	1.6863	2132
LNMATURE	7.8485	8.2039	8.3853	8.1576	0.8654	2132
LNTOTDEBTUNDERWRITING	22.2887	22.9611	23.4945	22.6629	1.3806	2132
MVE_BVE	1.5201	2.3330	3.6108	2.0611	4.1674	2132
SALEGROWTH	0.0162	0.0764	0.1786	0.1347	0.2950	2132
SALES	1214	4051	12144	11082	21123	2132
SIC2DEBTUNDERWRITERSHARE	0.1111	0.2097	0.3752	0.2874	0.2504	2132
Equity Underwriting Regressions	25th pct	Median	75th pct	Mean	Std	Count
ADJMKTLEVERAGE	0.0077	0.0879	0.2463	0.1502	0.1667	1864
LNAMT	17.0841	17.7365	18.4000	17.7480	1.0855	1864
LNASSET	17.5133	18.4171	19.6123	18.6313	1.6719	1864
LNMVE	18.2538	19.0283	20.0088	19.1094	1.4457	1864
LNTOTEQUNDERWRITING	19.5186	21.0705	22.0667	20.6364	1.8638	1864
MVE_BVE	1.9889	3.1417	5.4753	2.9615	6.1149	1864
SALEGROWTH	0.1017	0.2445	0.4810	0.3352	0.5839	1864
SIC2EQUNDERWRITERSHARE	0.0241	0.0646	0.1653	0.1406	0.1944	1864
VOLATILITY	0.4063	0.5256	0.6718	0.5655	0.2426	1864

Table V (continue)
Summary Statistics of Exogenous Variables Used in Regressions

PANEL B: MEAN OF INDICATORS VARIABLES					
Loan Regressions		Debt Underwriting Regressions		Equity Underwriting Regressions	
IB	0.0467	IB	0.7617	IB	0.9152
PL	0.4982	PL	0.4756	PL	0.2688
PD	0.2605	PD	0.4146	PD	0.0708
PE	0.1761	PE	0.1670	PE	0.2516
SL	0.4413	SL	0.4784	SL	0.2307
SD	0.2253	SD	0.4362	SD	0.0923
SE	0.1303	SE	0.1196	SE	0.1164
MPL	0.2790	MPL	0.1295	MPL	0.0134
MPD	0.0260	MPD	0.2453	MPD	0.0418
MPE	0.0080	MPE	0.0675	MPE	0.1711
MSL	0.2713	MSL	0.1252	MSL	0.0123
MSD	0.0305	MSD	0.2538	MSD	0.0494
MSE	0.0073	MSE	0.0497	MSE	0.0740
MULTIPLELENDER	0.9498	ACQLOB	0.0342	ACQLOB	0.0547
COMBODEAL	0.3448	CALLABLE	0.3194	INVGRADE	0.0649
BRIDGE	0.0189	COMPBID	0.0127	MULTIPLEBANKER	0.0461
REVOLVER	0.4941	FLOAT	0.0239	RATED	0.3664
STREVOLVER	0.3039	INVGRADE	0.7378	REFINDEBT	0.0655
TERMB	0.0497	LISTED	0.1417	REPAYBANK	0.1964
TERMBSUB	0.0117	MTNPROG	0.0038	SHELFREG	0.0456
SECURE	0.4020	MULTIPLEBANKER	0.2223		
PRIME	0.0387	PUTTABLE	0.2167		
SUBORNINATE	0.0006	REFINDEBT	0.1998		
BUYOUT	0.0251	REPAYBANK	0.2688		
CAPRESTRUC	0.0241	SHELFREG	0.7758		
CPBACKUP	0.1857				
DEBTREPAY	0.2359				
TAKEOVER	0.2210				
WORKCAP	0.0921				
PERFPRC	0.4801				
AAA	0.0036				
AA	0.0329				
A	0.1686				
BBB	0.2893				
BB	0.2736				
B	0.2027				

Table VI

Two-stage Least Square Estimates of Loan Pricing and Quantity Regressions

This table presents two-stage least square estimates of a system of equations where log all-in-spread (LNSPREAD) and log loan amount (LNAMT) are allowed to be determined jointly. Model A and C include IB dummy but does not interact with financing pattern and relationship variables. Model B and D allow IB interaction. Both LNSPREAD and LNAMT equations are overidentified with SALEGROWTH and MVE_BVE as instruments for LNAMT in LNSPREAD equation. Whereas PRIME and SUBORDINATE are instruments for LNSPREAD in LNAMT equations. A set of specification tests are listed at the end of the table. The first statistic tests the significance level of instruments (individually and jointly) in the first-stage regressions. The second test implements Hausman (1978) principle in a regression-base procedure by regressing the residual from the second-stage regression on all exogenous variables. The test statistic is constructed as N times R-sq of this residual regression. This statistic is distributed asymptotically as Chi-sq with degree of freedom equals to number of overidentifying instruments. The last test is also the regression-base Hausman test for endogeneity of LNSPREAD and LNAMT. To test for endogeneity of LNAMT in LNSPREAD regression, the OLS residuals from the first-stage regression of LNAMT are included in LNSPREAD regression. The test statistics is simply the t-stat of LNAMT residuals. The test for endogeneity of LNSPREAD in LNAMT regression is done similarly.

	LNSPREAD Regressions						LNAMT Regressions					
	A: No IB Interaction		B: IB Interaction				C: No IB Interaction		D: IB Interaction		E: Constrained Matching Effect	
	Coefficient	Std Err	Coefficient	Std Err			Coefficient	Std Err	Coefficient	Std Err	Coefficient	Std Err
INTERCEPT	5.8358	0.3061 ***	5.8442	0.3062 ***	Int	INTERCEPT	9.5591	0.5694 ***	9.5672	0.5700 ***	9.5827	0.5677 ***
LNAMT	0.0845	0.0228 ***	0.0850	0.0229 ***	lns	LNSPREAD	-0.9134	0.0784 ***	-0.9132	0.0783 ***	-0.9040	0.0782 ***
PL	0.0224	0.0232	0.0169	0.0136	PL	PL	0.0054	0.0241	0.0015	0.0249	-0.0291	0.0202
PD	-0.0638	0.0115 ***	-0.0593	0.0117 ***	PD	PD	-0.0585	0.0215 ***	-0.0585	0.0217 ***	-0.0599	0.0207 ***
PE	0.0403	0.0299	0.0370	0.0302	PE	PE	0.2820	0.0206 ***	0.2817	0.0210 ***	0.2660	0.0200 ***
MPL	-0.0072	0.0138	0.0012	0.0143	MI	MPL	-0.0652	0.0235 ***	-0.0720	0.0244 ***		
MPD	0.0085	0.0218	0.0032	0.0243	MI	MPD	-0.0517	0.0392	-0.0702	0.0434		
MPE	-0.0698	0.0295 **	-0.0127	0.0602	MI	MPE	-0.2214	0.0697 ***	-0.1190	0.0590 **		
SL	0.0313	0.0146 **	0.0329	0.0150 **	SL	SL	0.0029	0.0266	-0.0017	0.0274	-0.0127	0.0199
SD	-0.1697	0.0165 ***	-0.1709	0.0166 ***	SD	SD	0.0191	0.0244	0.0175	0.0248	0.0131	0.0234
SE	-0.0290	0.0262	-0.0275	0.0262	SE	SE	0.1335	0.0225 ***	0.1305	0.0228 ***	0.1251	0.0216 ***
MSL	-0.0011	0.0155	0.0027	0.0161	MS	MSL	-0.0804	0.0264 ***	-0.0868	0.0273 ***		
MSD	-0.0307	0.0199	-0.0272	0.0212	MS	MSD	-0.0368	0.0164 **	-0.0244	0.0387		
MSE	0.1567	0.0411 ***	0.2133	0.0596 ***	MS	MSE	-0.0293	0.0729	-0.0014	0.1073		
IB	0.0827	0.0241 ***	0.1105	0.0384 ***	IB	IB	0.2339	0.0364 ***	0.2499	0.0682 ***	0.2075	0.0842 **
IB_PL			0.0608	0.0536		IB_PL			0.0321	0.0979		
IB_PD			-0.1417	0.0619 **		IB_PD			-0.0249	0.1126		
IB_PE			0.0933	0.0590		IB_PE			-0.0166	0.1071		
IB_MPL			-0.1044	0.0896		IB_MPL			-0.0711	0.0908		
IB_MPD			0.1398	0.0985		IB_MPD			0.1302	0.1255		
IB_MPE			-0.1961	0.0909 **		IB_MPE			-0.1821	0.1667		
IB_SL			-0.0369	0.0625		IB_SL			0.0411	0.1137		
IB_SD			0.0165	0.0092 *		IB_SD			0.0523	0.1154		
IB_SE			-0.0669	0.0701		IB_SE			0.0870	0.1268		
IB_MSL			-0.0383	0.0592		IB_MSL			-0.0531	0.1080		
IB_MSD			-0.0444	0.0739		IB_MSD			-0.1497	0.1343		
IB_MSE			-0.0556	0.0992		IB_MSE			-0.1285	0.1809		
MULTIPLELENDER	-0.1789	0.0566 ***	-0.1788	0.0567 ***	sal	SALEGROWTH	0.0564	0.0206 ***	0.0574	0.0207 ***	0.0564	0.0206 ***
LNTOTLENDING	-0.0133	0.0028 ***	-0.0135	0.0028 ***	mv	MVE_BVE	0.0010	0.0001 ***	0.0010	0.0001 ***	0.0010	0.0001 ***
LNMATURE	-0.1037	0.0162 ***	-0.1038	0.0162 ***	mu	MULTIPLELENDER	0.6266	0.0372 ***	0.6273	0.0372 ***	0.6254	0.0370 ***

Table VI (continue)

Two-stage Least Square Estimates of Loan Pricing and Quantity Regressions

	LNSPREAD Regressions					LNAMT Regressions					
	A: No IB Interaction		B: IB Interaction			C: No IB Interaction		D: IB Interaction		E: Constrained Matching Effect	
	Coefficient	Std Err	Coefficient	Std Err		Coefficient	Std Err	Coefficient	Std Err	Coefficient	Std Err
TERMB	0.2364	0.0313 ***	0.2344	0.0314 ***	LNTOTLENDING	0.0115	0.0044 ***	0.0113	0.0045 **	0.0100	0.0044 **
TERMBSUB	0.3905	0.0372 ***	0.3933	0.0372 ***	LNMATURE	0.1041	0.0179 ***	0.1042	0.0179 ***	0.0996	0.0179 ***
REVOLVER	-0.0615	0.0284 **	-0.0612	0.0283 **	TERMB	0.5466	0.0442 ***	0.5467	0.0442 ***	0.5384	0.0442 ***
STREVOLVER	-0.2405	0.0348 ***	-0.2402	0.0348 ***	TERMBSUB	0.3326	0.0742 ***	0.3349	0.0744 ***	0.3146	0.0742 ***
BRIDGE	0.0579	0.0643	0.0555	0.0643	REVOLVER	0.3357	0.0193 ***	0.3358	0.0193 ***	0.3356	0.0193 ***
COMBODEAL	0.2484	0.0314 ***	0.2478	0.0314 ***	STREVOLVER	0.2309	0.0350 ***	0.2307	0.0350 ***	0.2248	0.0349 ***
SECURE	0.3556	0.0129 ***	0.3558	0.0128 ***	BRIDGE	0.8695	0.0606 ***	0.8670	0.0606 ***	0.8598	0.0604 ***
PERFPRC	-0.0770	0.0184 ***	-0.0769	0.0184 ***	COMBODEAL	-0.2093	0.0264 ***	-0.2100	0.0263 ***	-0.2126	0.0263 ***
PRIME	0.5043	0.0372 ***	0.5051	0.0372 ***	SECURE	0.2140	0.0345 ***	0.2142	0.0345 ***	0.2138	0.0344 ***
SUBORNINATE	0.1509	0.0669 **	0.1562	0.0669 **	PERFPRC	-0.0325	0.0465	-0.0325	0.0465	-0.0380	0.0464
TAKEOVER	-0.0518	0.0441	-0.0521	0.0442	TAKEOVER	0.5693	0.0239 ***	0.5697	0.0239 ***	0.5678	0.0238 ***
CAPRESTRUC	0.0177	0.0346	0.0172	0.0347	CAPRESTRUC	0.3246	0.0509 ***	0.3246	0.0510 ***	0.3268	0.0508 ***
CPBACKUP	-0.2521	0.0206 ***	-0.2527	0.0206 ***	CPBACKUP	-0.0002	0.0309	0.0005	0.0310	0.0049	0.0309
DEBTREPAY	-0.0558	0.0190 ***	-0.0555	0.0190 ***	DEBTREPAY	0.1712	0.0218 ***	0.1713	0.0219 ***	0.1788	0.0218 ***
BUYOUT	0.1571	0.0308 ***	0.1545	0.0309 ***	BUYOUT	0.3723	0.0511 ***	0.3722	0.0512 ***	0.3914	0.0509 ***
WORKCAP	-0.0082	0.0152	-0.0088	0.0152	WORKCAP	0.0040	0.0277	0.0032	0.0278	0.0138	0.0277
LNASSET	-0.0693	0.0296 **	-0.0699	0.0296 **	LNASSET	0.5198	0.0071 ***	0.5195	0.0071 ***	0.5186	0.0071 ***
ADJMKTLEVERAGE	0.3532	0.0966 ***	0.3494	0.0967 ***	ADJMKTLEVERAGE	1.7359	0.0593 ***	1.7357	0.0592 ***	1.7281	0.0592 ***
AAA	-1.6966	0.0698 ***	-1.6971	0.0699 ***	AAA	-1.1858	0.1806 ***	-1.1821	0.1806 ***	-1.1724	0.1798 ***
AA	-1.6570	0.0591 ***	-1.6605	0.0592 ***	AA	-0.7726	0.1434 ***	-0.7730	0.1436 ***	-0.7573	0.1427 ***
A	-1.2206	0.0363 ***	-1.2216	0.0364 ***	A	-0.7433	0.1099 ***	-0.7416	0.1099 ***	-0.7401	0.1093 ***
BBB	-0.5949	0.0258 ***	-0.5964	0.0258 ***	BBB	-0.4088	0.0674 ***	-0.4083	0.0675 ***	-0.4101	0.0670 ***
BB	-0.1997	0.0227 ***	-0.2004	0.0227 ***	BB	-0.1421	0.0460 ***	-0.1408	0.0460 ***	-0.1445	0.0457 ***
B	-0.0785	0.0248 ***	-0.0788	0.0248 ***	B	-0.2498	0.0415 ***	-0.2493	0.0415 ***	-0.2531	0.0413 ***
RATEFORE	0.0202	0.0108 *	0.0212	0.0109 *	FORECASTRATING	-0.1541	0.0200 ***	-0.1547	0.0200 ***	-0.1435	0.0200 ***
					MATCH					-0.0890	0.0259 ***
					IB_MATCH					-0.0076	0.0906
Adj R-sq		0.7886		0.7887	Adj R-sq		0.7996		0.7995		0.8005
N		14439		14439	N		14439		14439		14439

Specification Tests

1. Tests for significance of instruments in first-stage regression											
SALEGROWTH	t(14380)	2.79 ***	t(14368)	2.43 ***	PRIME	t(14380)	38.31 ***	t(14368)	25.83 ***	t(14384)	25.37 ***
MVE_BVE	t(14380)	11.48 ***	t(14368)	10.41 ***	SUBORDINATE	t(14380)	2.30 **	t(14368)	2.97 **	t(14384)	2.67 **
jointly	F(2, 14380)	71.51 ***	F(2, 14368)	71.36 ***	jointly	F(2, 14380)	274.42 ***	F(2, 14368)	273.75 ***	F(2,14384)	285.27
2. Overidentification test for validity of instruments (H0:instruments are exogenous)											
jointly	Chi-sq(1)	0.37	Chi-sq(1)	0.26	jointly	Chi-sq(1)	0.12	Chi-sq(1)	0.11	Chi-sq(1)	0.17
3. Hausman-type test for endogeneity of simultaneous variables (H0: simultaneous variable is exogenous)											
1-stage residual	t(14379)	-12.77 ***	t(14367)	-11.51 ***	1-stage residual	t(14379)	-3.93 ***	t(14367)	-3.43 ***	t(14383)	-3.41 ***

Table VII

Generalized Method of Moments Estimates of Loan Pricing and Quantity Regressions

This table presents the generalized method of moment estimates of a system of equations where log all-in-spread (LNSPREAD) and log loan amount (LNAMT) are allowed to be determined jointly. Model A and C include IB dummy but does not interact with financing pattern and relationship variables. Model B and D allow IB interaction. Both LNSPREA and LNAMT equations are overidentified with SALEGROWTH and MVE_BVE as instruments for LNAMT in LNSPREAD equation. Whereas PRIME and SUBORDINATE a instruments for LNSPREAD in LNAMT equations. Under GMM framework, the estimators utilize cross equations correlation in estimation and are fully robust to heteroskdastici An overidentification test based on objective function of the GMM is reported at the end of the table.

	LNSPREAD Regressions					LNAMT Regressions			
	A: No IB Interaction		B: IB Interaction			C: No IB Interaction		D: IB Interaction	
	Coefficient	Std Err	Coefficient	Std Err		Coefficient	Std Err	Coefficient	Std Err
INTERCEPT	6.4170	0.2099 ***	6.5681	0.2190 ***	INTERCEPT	10.7960	0.8346 ***	10.4716	0.8423 ***
LNAMT	0.0631	0.0237 ***	0.0584	0.0235 **	LNSPREAD	-1.1559	0.1102 ***	-1.0700	0.1125 ***
PL	0.0136	0.0153	0.0139	0.0154	PL	-0.0093	0.0288	-0.0093	0.0280
PD	-0.0453	0.0185 **	-0.0423	0.0194 **	PD	-0.0641	0.0346 *	-0.0670	0.0335 **
PE	0.0259	0.0185	0.0238	0.0180	PE	0.2721	0.0313 ***	0.2603	0.0300 ***
MPL	0.0109	0.0125	0.0150	0.0125	MPL	-0.0550	0.0210 ***	-0.0513	0.0229 **
MPD	-0.0074	0.0261	-0.0058	0.0278	MPD	-0.0750	0.0443 *	-0.1068	0.0488 **
MPE	-0.0605	0.0256 **	0.0140	0.0480	MPE	-0.2235	0.0631 ***	-0.2477	0.0951 ***
SL	0.0344	0.0174 **	0.0394	0.0278	SL	0.0230	0.0314	0.0250	0.0332
SD	-0.1804	0.0212 ***	-0.1833	0.0199 ***	SD	-0.0255	0.0400	-0.0285	0.0412
SE	0.0027	0.0195	0.0038	0.0202	SE	0.1725	0.0373 ***	0.1706	0.0388 ***
MSL	-0.0117	0.0145	-0.0091	0.0143	MSL	-0.0669	0.0271 **	-0.0592	0.0284 **
MSD	-0.0265	0.0222	-0.0229	0.0225	MSD	-0.0609	0.0355 *	-0.0473	0.0402
MSE	0.1121	0.0373 ***	0.1684	0.0532 ***	MSE	-0.0660	0.0784	-0.0730	0.1442
IB	0.0741	0.0192 ***	0.1459	0.0317 ***	IB	0.1895	0.0362 ***	0.1812	0.0635 ***
IB_PL			0.0024	0.0468	IB_PL			-0.0070	0.0797
IB_PD			-0.0548	0.0624	IB_PD			0.0440	0.0870
IB_PE			0.0293	0.0637	IB_PE			0.0035	0.0937
IB_MPL			-0.0917	0.0783	IB_MPL			0.0287	0.0788
IB_MPD			0.0739	0.0744	IB_MPD			0.0904	0.1087
IB_MPE			-0.1430	0.0662 **	IB_MPE			-0.1868	0.1495
IB_SL			-0.0843	0.0553	IB_SL			-0.0705	0.0925
IB_SD			0.1104	0.0656 *	IB_SD			0.1715	0.1036 *
IB_SE			-0.0570	0.0526	IB_SE			-0.1514	0.1083
IB_MSL			-0.0359	0.0595	IB_MSL			0.1064	0.0948
IB_MSD			-0.1028	0.0862	IB_MSD			-0.1271	0.1131
IB_MSE			-0.0403	0.0783	IB_MSE			0.1331	0.1908
MULTIPLELENDER	-0.1763	0.0451 ***	-0.1713	0.0432 ***	MULTIPLELENDER	0.7394	0.0543 ***	0.7323	0.0564 ***
LNTOTLENDING	-0.0149	0.0026 ***	-0.0145	0.0026 ***	LNTOTLENDING	0.0108	0.0050 **	0.0108	0.0052 **

Table VII (continue)
Generalized Method of Moments Estimates of Loan Pricing and Quantity Regressions

	LNSPREAD Regressions					LNAMT Regressions			
	A: No IB Interaction		B: IB Interaction			C: No IB Interaction		D: IB Interaction	
	Coefficient	Std Err	Coefficient	Std Err		Coefficient	Std Err	Coefficient	Std Err
LNMATURE	-0.1160	0.0191 ***	-0.1267	0.0179 ***	LNMATURE	0.0850	0.0307 ***	0.0840	0.0311 ***
TERMB	0.2407	0.0267 ***	0.2592	0.0273 ***	TERMB	0.5704	0.0579 ***	0.5729	0.0614 ***
TERMBSUB	0.4191	0.0419 ***	0.3927	0.0400 ***	TERMBSUB	0.3053	0.0966 ***	0.2948	0.1010 ***
REVOLVER	-0.0757	0.0229 ***	-0.0751	0.0233 ***	REVOLVER	0.3556	0.0299 ***	0.3534	0.0291 ***
STREVOLVER	-0.2882	0.0331 ***	-0.2925	0.0337 ***	STREVOLVER	0.1290	0.0621 **	0.1357	0.0613 **
BRIDGE	0.0603	0.0683	0.0594	0.0714	BRIDGE	0.8325	0.1021 ***	0.8627	0.1111 ***
COMBODEAL	0.2803	0.0241 ***	0.2836	0.0231 ***	COMBODEAL	-0.1073	0.0414 ***	-0.1082	0.0432 **
SECURE	0.3495	0.0163 ***	0.3460	0.0170 ***	SECURE	0.3073	0.0499 ***	0.3063	0.0504 ***
PERFPRC	-0.1518	0.0362 ***	-0.1489	0.0372 ***	PERFPRC	-0.0338	0.0643	-0.0317	0.0639
PRIME	0.5512	0.0373 ***	0.5480	0.0352 ***	SALEGROWTH	0.0556	0.0319 *	0.0563	0.0320 *
SUBORDINATE	0.1485	0.0726 **	0.1490	0.0750 **	MVE_BVE	0.0009	0.0001 ***	0.0009	0.0001 ***
TAKEOVER	-0.0530	0.0387	-0.0515	0.0378	TAKEOVER	0.7092	0.0384 ***	0.7378	0.0354 ***
CAPRESTRUC	0.0175	0.0454	0.0169	0.0433	CAPRESTRUC	0.5897	0.0749 ***	0.5702	0.0794 ***
CPBACKUP	-0.2662	0.0236 ***	-0.2580	0.0255 ***	CPBACKUP	-0.0015	0.0467	-0.0004	0.0497
DEBTREPAY	-0.0571	0.0212 ***	-0.0556	0.0207 ***	DEBTREPAY	0.2311	0.0326 ***	0.2200	0.0314 ***
BUYOUT	0.2205	0.0444 ***	0.2165	0.0432 ***	BUYOUT	0.4121	0.0882 ***	0.4110	0.0893 ***
WORKCAP	-0.0111	0.0204	-0.0110	0.0194	WORKCAP	0.1032	0.0380 ***	0.1059	0.0378 ***
LNASSET	-0.0618	0.0268 **	-0.0612	0.0272 **	LNASSET	0.5480	0.0135 ***	0.5463	0.0131 ***
ADJMKTLEVERAGE	0.4285	0.0643 ***	0.4335	0.0614 ***	ADJMKTLEVERAGE	1.9649	0.0953 ***	1.9054	0.0981 ***
AAA	-1.7708	0.0677 ***	-1.7103	0.0642 ***	AAA	-1.5323	0.2481 ***	-1.5034	0.2467 ***
AA	-1.7017	0.0535 ***	-1.6607	0.0531 ***	AA	-0.9231	0.2078 ***	-0.9337	0.2179 ***
A	-1.1536	0.0472 ***	-1.1235	0.0480 ***	A	-0.8286	0.1569 ***	-0.8243	0.1543 ***
BBB	-0.6222	0.0346 ***	-0.6208	0.0342 ***	BBB	-0.3538	0.1080 ***	-0.3667	0.1028 ***
BB	-0.2172	0.0293 ***	-0.2083	0.0300 ***	BB	-0.0854	0.0757	-0.0866	0.0717
B	-0.0866	0.0299 ***	-0.0825	0.0287 ***	B	-0.2243	0.0684 ***	-0.2162	0.0633 ***
RATEFORE	0.0316	0.0188 *	0.0326	0.0207	RATEFORE	-0.1644	0.0306 ***	-0.1563	0.0298 ***
N		14439		14439	N		14439		14439
GMM Obj Fn		1517.5		2515.3	GMM Obj Fn		1985.4		2207.7

Specification Tests

1. Overidentification test for validity of instruments (H0:instruments are exogenous) based on GMM Objective Function / N

jointly	Chi-sq(2)	0.1051		0.1742	Chi-sq(2)	0.1375		0.1529

Table VIII
GMM Estimates of Loan Pricing Regressions by Time Period and Borrower Sales

This table presents the generalized method of moment estimates of a system of equations where log all-in-spread (LNSPREAD) and log loan amount (LNAMT) are allowed to be determined jointly. The sample are divided into pre 1998 and post 1998 subsamples and subsamples created by borrowers sales size classification. Model A and C include IB dummy but does not interact with financing pattern and relationship variables. Model B and D allow IB interaction. Both LNSPREAD and LNAMT equations are overidentified with SALEGROWTH and MVE_BVE as instruments for LNAMT in LNSPREAD equation. Whereas PRIME and SUBORDINATE are instruments for LNSPREAD in LNAMT equations. Under GMM framework, the estimators utilize cross equations correlation in estimation and are fully robust to heteroskdasticity. An overidentification test based on objective function of the GMM is reported at the end of the table.

	LNSPREAD Regressions by Time Period				LNSPREAD Regressions by Borrower Sales									
	Pre-1998		Post-1998		Sales < 250M		250M<Sales< 500M		500M<Sales< 1B		1B<Sales<10B		Sales>10B	
	Coefficient	Std Err	Coefficient	Std Err	Coefficient	Std Err	Coefficient	Std Err	Coefficient	Std Err	Coefficient	Std Err	Coefficient	Std Err
INTERCEPT	5.7234	1.0523 ***	6.1057	0.2112 ***	5.0871	0.5874 ***	5.2170	0.5142 ***	4.3043	1.6391 ***	7.3201	0.2752 ***	12.6600	1.4494 ***
LNAMT	0.4001	0.1190 ***	0.1233	0.0444 ***	0.2498	0.1274 **	0.2531	0.0862 ***	0.3268	0.1598 **	0.3053	0.0799 ***	0.2628	0.1473 *
PL	-0.0271	0.0395	0.0213	0.0172	-0.0165	0.0271	0.0145	0.0357	0.0807	0.0463 *	-0.0318	0.0145 **	0.0229	0.0371
PD	-0.0634	0.0290 **	-0.0468	0.0228 **	0.2148	0.1914	-0.0198	0.0439	-0.0583	0.0268 **	-0.0364	0.0149 **	-0.0464	0.0140 ***
PE	0.0136	0.0561	0.0104	0.0213	-0.0732	0.0445	-0.0732	0.0381 *	-0.0364	0.0501	0.0884	0.0198 ***	0.2629	0.0504 ***
MPL	0.0794	0.0362 **	0.0026	0.0147	0.0250	0.0286	0.0423	0.0363	-0.1037	0.0455 **	0.0126	0.0147	-0.0371	0.0304
MPD	0.0936	0.1258	-0.0235	0.0269	-0.2715	0.2064	-0.0083	0.1726	0.3298	0.2456	-0.0136	0.0358	-0.0343	0.0430
MPE	0.3772	0.2517	-0.0248	0.0476	-0.1145	0.1581	0.0894	0.1893	0.2526	0.2391	-0.1685	0.1023 *	0.1812	0.1878
SL	0.0122	0.0380	0.0484	0.0201 **	-0.0172	0.0312	0.0272	0.0368	-0.0623	0.0407	0.0349	0.0144 **	0.0327	0.0393
SD	-0.2305	0.1067 **	-0.1906	0.0225 ***	0.0095	0.0599	-0.0328	0.0562	-0.1791	0.0538 ***	-0.0954	0.0176 ***	-0.1461	0.0330 ***
SE	-0.1473	0.0639 **	0.0630	0.0253 **	-0.1130	0.0402 ***	0.0976	0.0342 ***	0.1046	0.0444 **	0.1052	0.0202 ***	-0.0061	0.0527
MSL	0.0663	0.0335 **	-0.0493	0.0161 ***	-0.0343	0.0385	0.0422	0.0419	0.0613	0.0397	-0.0247	0.0168	-0.0261	0.0239
MSD	-0.0814	0.0694	0.0009	0.0257	-0.0003	0.1561	-0.5237	0.1696 ***	-0.1199	0.1321	-0.0394	0.0298	-0.0196	0.0356
MSE	0.2065	0.0996 **	0.1110	0.0363 ***	0.1019	0.4369	0.3545	0.1320 ***	0.1652	0.0745 **	0.0918	0.0429 **	0.4719	0.3144
IB	0.2429	0.1057 **	0.1399	0.0311 ***	0.1015	0.0794	0.0621	0.0853	0.0832	0.0624	0.1472	0.0422 ***	0.1223	0.1172
IB_PL	0.1686	0.1763	-0.0487	0.0495	-0.0126	0.1373	0.1935	0.1641	-0.2539	0.2101	-0.0271	0.0635	0.0059	0.1204
IB_PD	-0.3458	0.2135	0.0272	0.0695	-0.5636	0.3139 *	-0.0546	0.2874	0.6746	0.4279	-0.0410	0.0914	0.0099	0.1079
IB_PE	-0.1282	0.2628	0.0383	0.0661	0.4009	0.2551	0.0070	0.1842	0.0390	0.3329	-0.1790	0.0824 **	0.0404	0.1034
IB_MPL	-0.2541	0.1711	-0.0607	0.0502	0.0021	0.1414	-0.3155	0.2956	0.2238	0.2094	-0.0031	0.0683	-0.0492	0.0917
IB_MPD	0.0410	0.2482	0.0543	0.0734	0.8099	0.4718 *	0.1324	0.4080	-0.9639	0.6505	0.1239	0.1147	0.0455	0.1009
IB_MPE	-0.3019	0.3405	-0.1146	0.0582 **	-0.3324	0.3210	-0.1413	0.3213	-0.3320	0.4148	-0.3018	0.1515 **	-0.3116	0.1241 **
IB_SL	-0.0092	0.2364	-0.0684	0.0593	0.6497	0.3275 **	-0.1714	0.1343	-0.2516	0.1825	-0.0994	0.0742	0.1783	0.1153
IB_SD	0.1521	0.2553	0.0584	0.0694	0.0342	0.3108	-0.1926	0.3511	-0.4092	0.4363	0.2521	0.0960 ***	-0.1171	0.0960
IB_SE	-0.2772	0.1763	-0.0760	0.0597	0.2921	0.2061	0.1560	0.1969	0.0357	0.2473	-0.2055	0.0886 **	0.0156	0.1497
IB_MSL	-0.3311	0.2013	-0.0017	0.0615	-0.1418	0.3044	-0.1199	0.1634	0.1349	0.2006	0.0440	0.0830	-0.1466	0.1005
IB_MSD	0.1139	0.3115	-0.1305	0.0809	0.0782	0.4390	0.2375	0.4420			-0.1310	0.1289	0.0384	0.1043
IB_MSE	0.0541	0.2833	0.0233	0.0851	-0.2419	0.5477	-0.0475	0.2878	0.2010	0.6211	-0.0036	0.1305	0.6025	0.3432 *
MULTIPLELENDER	-0.2153	0.1218 *	-0.1657	0.0458 ***	-0.2342	0.0855 ***	-0.3485	0.1129 ***	-0.7807	0.3439 **	0.5164	0.1559 ***		
LNTOTLENDING	-0.0291	0.0090 ***	-0.0093	0.0033 ***	-0.0178	0.0037 ***	-0.0292	0.0074 ***	-0.0092	0.0074	-0.0126	0.0047 ***	-0.0082	0.0090

Table VIII (continue)

GMM Estimates of Loan Pricing Regressions by Time Period and Borrower Sales

	LNSPREAD Regressions by Time Period				LNSPREAD Regressions by Borrower Sales									
	Pre-1998		Post-1998		Sales < 250M		250M<Sales< 500M		500M<Sales< 1B		1B<Sales<10B		Sales>10B	
	Coefficient	Std Err	Coefficient	Std Err	Coefficient	Std Err	Coefficient	Std Err	Coefficient	Std Err	Coefficient	Std Err	Coefficient	Std Err
LNMATURE	-0.1558	0.0718 **	-0.1252	0.0227 ***	-0.1470	0.0359 ***	-0.1613	0.0361 ***	-0.2606	0.0805 ***	-0.0704	0.0167 ***	-0.0829	0.0306 ***
TERMB	0.3926	0.0892 ***	0.1777	0.0297 ***	0.1580	0.0698 **	0.1438	0.0512 ***	0.0126	0.1352	0.2945	0.0319 ***	0.1743	0.1117
TERMBSUB	0.5853	0.1628 ***	0.3197	0.0433 ***	0.1652	0.0905 *	0.3325	0.0933 ***	0.3362	0.0660 ***	0.2282	0.0511 ***		
REVOLVER	-0.1908	0.1422	-0.1017	0.0262 ***	-0.1249	0.0633 **	-0.0929	0.0383 **	-0.2492	0.1246 **	0.0064	0.0286	0.0945	0.1135
STREVOLVER	-0.2777	0.1087 **	-0.3647	0.0405 ***	-0.1008	0.0418 **	-0.1544	0.0511 ***	-0.4878	0.0991 ***	-0.2728	0.0299 ***	0.0579	0.1460
BRIDGE	0.1542	0.2256	-0.1147	0.0744	-0.1918	0.1388	0.2754	0.1341 **	-0.4259	0.1905 **	0.1050	0.0563 *	0.6723	0.1874 ***
COMBODEAL	0.3829	0.1480 ***	0.3388	0.0245 ***	0.2902	0.0801 ***	0.2919	0.0413 ***	0.2632	0.0801 ***	0.2138	0.0244 ***	0.2784	0.0614 ***
SECURE	0.5603	0.0666 ***	0.2617	0.0189 ***	0.3112	0.0326 ***	0.3337	0.0256 ***	0.3670	0.0264 ***	0.3422	0.0163 ***	0.6566	0.0557 ***
PERFPRC	-0.2729	0.1040 ***	-0.0548	0.0164 ***	-0.1120	0.0346 ***	-0.1562	0.0280 ***	-0.1886	0.0503 ***	-0.1188	0.0744	0.1049	0.0308 ***
PRIME	0.6007	0.0800 ***	0.5169	0.0484 ***	0.5748	0.0552 ***	0.8782	0.0734 ***	0.9308	0.2217 ***	0.6331	0.1029 ***	1.3117	0.7827 *
SUBORDINATE	0.2677	0.1169 **	0.1078	0.0548 **	-0.1896	0.2294	0.0420	0.0232 *	0.4777	0.2556 *			-1.6451	0.5157 ***
TAKEOVER	-0.2263	0.1855	-0.0518	0.0416	0.0586	0.0549	-0.1522	0.0624 **	-0.1948	0.1283	0.1727	0.0548 ***	0.6359	0.1638 ***
CAPRESTRUC	-0.1421	0.1977	0.1478	0.0565 ***	0.0458	0.0647	0.0048	0.0898	0.0873	0.0773	0.2114	0.0456 ***	0.1868	0.1849
CPBACKUP	-0.3120	0.0934 ***	-0.2573	0.0274 ***	-0.9351	0.1811 ***	-0.4012	0.0879 ***	-0.4485	0.1200 ***	-0.1299	0.0227 ***	0.0361	0.0807
DEBTREPAY	-0.1151	0.0796	-0.0309	0.0223	0.0404	0.0231 *	-0.0726	0.0353 **	-0.1732	0.0701 **	-0.0035	0.0231	0.3760	0.1043 ***
BUYOUT	0.2751	0.1381 **	0.2044	0.0470 ***	0.3409	0.0514 ***	0.1724	0.0820 **	0.1981	0.0779 **	0.2978	0.0392 ***	0.1926	0.0943 **
WORKCAP	0.0591	0.0516	0.0054	0.0237	0.0354	0.0273	0.0637	0.0398	-0.0500	0.0443	0.0492	0.0239 **	-0.0328	0.0779
LNASSET	-0.2705	0.1776	-0.0966	0.0272 ***	-0.1099	0.0708	-0.1277	0.0457 ***	-0.1199	0.0634 *	-0.1446	0.0467 ***	0.2029	0.0720 ***
ADJMKTLEVERAGE	0.4562	0.1951 **	0.4543	0.0553 ***	0.2458	0.1184 **	0.3418	0.0828 ***	0.6462	0.2010 ***	1.1169	0.1061 ***	1.4520	0.2348 ***
AAA	-1.5110	0.3527 ***	-1.8709	0.0667 ***	0.2303	0.3273							-2.5317	0.1620 ***
AA	-1.8746	0.4115 ***	-1.7088	0.0641 ***			0.3657	0.4844	-1.0034	0.1905 ***	-1.2647	0.1125 ***	-2.1224	0.1162 ***
A	-1.1600	0.1717 ***	-1.2647	0.0551 ***	-1.0111	0.0963 ***	-0.7356	0.1251 ***	-1.0573	0.0993 ***	-0.9427	0.0742 ***	-1.8618	0.1262 ***
BBB	-0.7628	0.1391 ***	-0.5832	0.0423 ***	-0.5556	0.0558 ***	-0.3639	0.0737 ***	-0.6293	0.0635 ***	-0.5055	0.0651 ***	-1.3204	0.1391 ***
BB	-0.1980	0.0864 **	-0.2720	0.0356 ***	-0.3087	0.0334 ***	-0.0611	0.0667	-0.2849	0.0597 ***	-0.2244	0.0647 ***	-1.1701	0.1840 ***
B	0.0261	0.0717	-0.1418	0.0355 ***	-0.1062	0.0312 ***	0.1418	0.0712 **	-0.0986	0.0674	-0.0377	0.0643	-1.5266	0.3420 ***
RATEFORE	0.0691	0.0261 ***	0.0349	0.0165 **	0.0406	0.0118 ***	0.0151	0.0061 **	0.0478	0.0225 **	0.0546	0.0229 **	0.0324	0.0226
N		3776		10663		2533		1572		1835		5878		2620
GMM Obj Fn		1552.7		3160.5		350.1		373.5		270.8		672.4		537.4
Overidentification Test Stats chisq(2)		0.4112		0.2964		0.1382		0.2376		0.1476		0.1144		0.2051

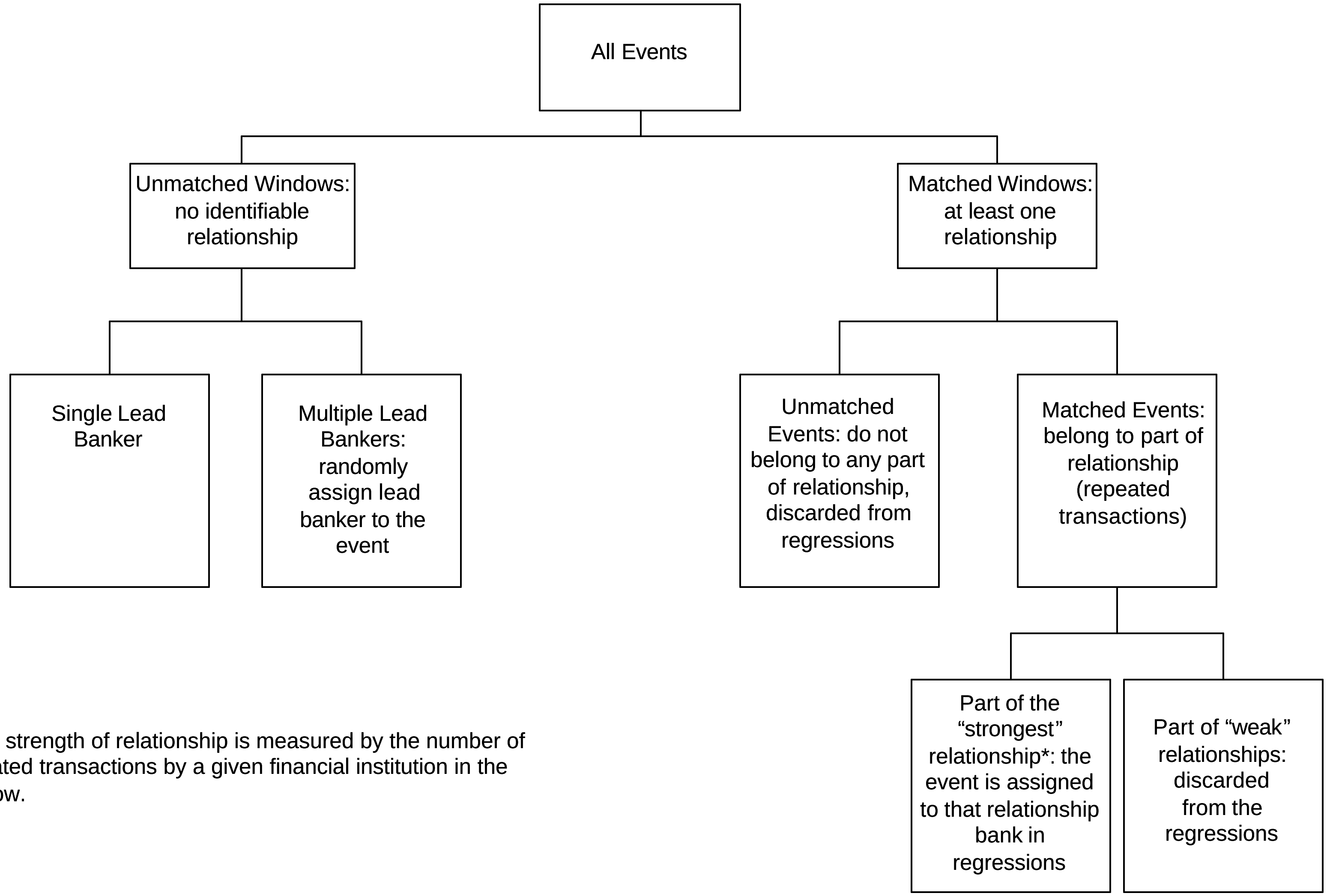
Table IX

Debt and Equity Underwriting Spread Regressions

This table presents OLS regressions of log equity and debt total spread (LNTOTSPREAD) for all equity and debt issues in our database. Model A and C include IB dummy but does not interact with financing pattern and relationship variables. Model B and D allow IB interaction. Total underwriting spread consists of gross spread and other direct expenses related to underwriting, which capture total underwriting costs. Time and industry dummies are included but not shown.

	Debt Total Spread Regressions					Equity Total Spread Regressions			
	A: No IB Interaction		B: IB Interaction			C: No IB Interaction		D: IB Interaction	
	Coefficient	Std Err	Coefficient	Std Err		Coefficient	Std Err	Coefficient	Std Err
INTERCEPT	7.7963	0.2102 ***	7.8689	0.2121 ***	INTERCEPT	11.2370	0.1119 ***	11.2288	0.1142 ***
PL	-0.0102	0.0183	-0.0588	0.0448	PL	-0.0088	0.0124	0.0111	0.0456
PD	-0.0719	0.0228 ***	-0.0866	0.0377 **	PD	0.0115	0.0301	-0.1256	0.0773
PE	0.0179	0.0259	-0.0241	0.0444	PE	-0.0409	0.0179 **	-0.0472	0.0433
MPL	0.0732	0.0298 **	0.1539	0.0440 ***	MPL	0.1422	0.0499 ***	0.1855	0.0826 **
MPD	0.0463	0.0341	-0.0432	0.0471	MPD	-0.0200	0.0368	0.1033	0.1347
MPE	0.0084	0.0376	0.1135	0.0916	MPE	0.0193	0.0201	0.0622	0.0623
SL	0.0041	0.0182	-0.0229	0.0426	SL	0.0172	0.0126	0.0198	0.0513
SD	0.0066	0.0217	-0.0151	0.0378	SD	0.0150	0.0253	0.1385	0.0815 *
SE	0.0145	0.0295	0.0499	0.0577	SE	-0.0238	0.0235	-0.0235	0.0916
MSL	0.0665	0.0288 **	0.1218	0.0461 ***	MSL	0.1083	0.0496 **	0.1206	0.0580 **
MSD	-0.0591	0.0231 **	-0.0829	0.0457 *	MSD	-0.0061	0.0321	-0.0481	0.1288
MSE	0.0067	0.0434	0.0530	0.1261	MSE	0.0409	0.0283	0.0936	0.1170
IB	0.0862	0.0213 ***	0.0697	0.0335 **	IB	0.0429	0.0186 **	0.0491	0.0243 **
IB_PL			0.0550	0.0488	IB_PL			-0.0212	0.0472
IB_PD			0.0152	0.0462	IB_PD			0.1637	0.0829 **
IB_PE			0.0632	0.0543	IB_PE			0.0087	0.0473
IB_MPL			-0.0914	0.0646	IB_MPL			-0.0419	0.1033
IB_MPD			0.1121	0.1553	IB_MPD			-0.1519	0.1410
IB_MPE			-0.1270	0.1011	IB_MPE			-0.0460	0.0662
IB_SL			0.0319	0.0471	IB_SL			-0.0012	0.0528
IB_SD			0.0287	0.0454	IB_SD			-0.1424	0.0854 *
IB_SE			-0.0511	0.0671	IB_SE			0.0020	0.0947
IB_MSL			-0.0545	0.0626	IB_MSL			0.0969	0.1099
IB_MSD			0.0285	0.0531	IB_MSD			0.0534	0.1332
IB_MSE			-0.0456	0.1345	IB_MSE			-0.0583	0.1207
MULTIPLEBANKER	0.0049	0.0253	0.0008	0.0253	MULTIPLEBANKER	0.0657	0.0266 **	0.0678	0.0271 **
LNTOTDEBTUNDERWRITING	-0.0171	0.0067 **	-0.0193	0.0068 ***	LNTOTEQUNDERWRITING	-0.0158	0.0036 ***	-0.0153	0.0036 ***
LNASSET	-0.1031	0.0080 ***	-0.1033	0.0080 ***	LNASSET	-0.0351	0.0080 ***	-0.0343	0.0080 ***
ADJMKTLEVERAGE	0.2276	0.0544 ***	0.2271	0.0545 ***	LNMVE	-0.0409	0.0087 ***	-0.0407	0.0087 ***
INVGRADE	-0.6666	0.0281 ***	-0.6632	0.0282 ***	VOLATILITY	0.1903	0.0247 ***	0.1943	0.0247 ***
LNMATURE	0.0712	0.0088 ***	0.0717	0.0088 ***	ADJMKTLEVERAGE	0.1677	0.0474 ***	0.1670	0.0475 ***
LNAMT	-0.0236	0.0115 **	-0.0230	0.0115 **	LNAMT	-0.1800	0.0086 ***	-0.1820	0.0087 ***
REPAYBANK	-0.0619	0.0183 ***	-0.0620	0.0183 ***	RATED	-0.0117	0.0115	-0.0117	0.0116
REFINDEBT	-0.0542	0.0202 ***	-0.0527	0.0204 ***	INVGRADE	0.0073	0.0210	0.0084	0.0211
ACQLOB	0.0783	0.0423 *	0.0795	0.0424 *	REPAYBANK	0.0058	0.0128	0.0068	0.0129
MTNPROG	-0.0978	0.1203	-0.0779	0.1206	REFINDEBT	0.0315	0.0196	0.0331	0.0196 *
FLOAT	-0.3319	0.0492 ***	-0.3241	0.0493 ***	ACQLOB	0.0448	0.0209 **	0.0433	0.0210 **
SHELFREG	-0.2019	0.0246 ***	-0.2054	0.0247 ***	SHELFREG	-0.0884	0.0246 ***	-0.0867	0.0254 ***
CALLABLE	0.1184	0.0206 ***	0.1194	0.0207 ***					
PUTTABLE	0.0901	0.0244 ***	0.0894	0.0244 ***					
LISTED	0.0808	0.0228 ***	0.0869	0.0229 ***					
COMPBID	-0.5856	0.0669 ***	-0.5833	0.0668 ***					
Adj R-sq		0.7765		0.7776	Adj R-sq		0.7348		0.7348
N		2132		2132	N		1844		1844

Figure 1 Classification of Events



Note

* The strength of relationship is measured by the number of repeated transactions by a given financial institution in the window.

References

Association for Financial Professional, 2004 Credit Access Survey.

Basel Committee on Banking Supervision, 2003, "Markets for Bank Subordinated Debt and Equity in Basel Committee Member Countries," August, Working Paper No. 12.

Beatty, Anne, and Joseph Weber, 2000, "Performance Pricing in Debt Contracts," Social Science Research Network Electronic Paper Collection: http://papers.ssrn.com/paper.taf?abstract_id=249172.

Beim, David O., 1996, "The Prime Premium: Is Relationship Banking Too Costly for Some?," Working Paper 1996, Columbia Business School.

Benston, George, 1989, The Separation of Commercial and Investment Banking: The Glass-Steagall Act Revisited and Reconsidered, Norwell: Kluwer Academic.

Berger, A., and Humphrey, D., 1991, "The dominance of inefficiencies of Scale and Product Mix Economies in Banking," *Journal of Monetary Economics* 28, 117-148.

Calomiris, Charles W., 1997, The Postmodern Bank Safety Net: Lessons from Developed and Developing Economies, Washington, D.C.: AEI Press.

Calomiris, Charles W., 1999, "Building an Incentive-Compatible Safety Net," *Journal of Banking and Finance* 23, October, 1499-520.

Calomiris, Charles W., 2000, U.S. Bank Deregulation in Historical Perspective, Cambridge: Cambridge University Press.

Calomiris, Charles W., and Charles P. Himmelberg, 2001, "Investment Banking Costs as a Measure of the Cost of External Finance", Working Paper, Columbia Business School, Revised May 2001.

Calomiris, Charles W., and Jason Karceski, 2000, "Is the Bank Merger Wave of the 90s Efficient?," in Mergers and Productivity, Steven Kaplan, ed., National Bureau of Economic Research, University of Chicago Press, 2000, 93-161.

Calomiris, Charles W., and Thanavut Pornrojnangkool, 2005, "Monopoly-Creating Bank Consolidation? The Merger of Fleet and BankBoston," National Bureau of Economic Research, Working Paper w11351, 2005.

Calomiris, Charles W., Charles P. Himmelberg, and Paul Wachtel, 1995, "Commercial Paper, Corporate Finance, and the Business Cycle: A Microeconomic Perspective," Carnegie-Rochester Series on Public Policy.

Covitz, D.M., D. Hancock, and M.L. Kwast, 2000, "Mandatory Subordinated Debt: Would Banks Face More Market Discipline?, Working Paper, Federal Reserve Board.

Drucker, Steve, and Manju Puri, 2005, "On the benefits of concurrent lending and underwriting," *Journal of Finance,* forthcoming.

Evanoff, Douglas D., and Larry D. Wall, 2001, "Sub-Debt Yield Spreads as Bank Risk Measures," *Journal of Financial Services Research*, 20, October, 121-46.

Evanoff, Douglas D., and Larry D. Wall, 2002, "Measures of the Riskiness of Banking Organizations: Subordinated Debt Yields, Risk-Based Capital, and Examination Ratings," *Journal of Banking and Finance*, May, 989-1009.

Fraser, Donald, Greg Hebb, and Gregory H. MacKinnon, "Lending and Underwriting: Evidence on Tying Behaviour by Banks", Working Paper, Saint Mary's University, undated.

Gande, Amar, Manju Puri, Anthony Saunders, and Ingo Walter, 1997, "Bank underwriting of debt securities: Modern evidence," *Review of Financial Studies* 10, 1175-1202.

General Accounting Office, 2003, Bank Tying Additional Steps Needed to Ensure Effective Enforcement of Tying Prohibitions, Report to the Chairman and Ranking Minority Member, Committee on Financial Services, House of Representatives.

Greenbaum, Stuart, George Kanatas, and Itzhak Venezia, 1989, "Equilibrium Loan Pricing Under the Bank Client Relationship," *Journal of Banking and Finance* 13, 221-235.

Hancock, D., and M.L Kwast, 2001, "Using Subordinated Debt to Monitor Bank Holding Companies: Is It Feasible?, Journal of Financial Services Research 20, October, 147-87.

Hausman, Jerry A., "Specification Tests in Econometrics," *Econometrica* 46, 1251-1271.

Kroszner, Randall, and Raghuram G. Rajan, 1994, "Is the Glass-Steagall Act Justified? A Study of the U.S. Experience with Universal Banking Before 1933," *American Economic Review* 84, September, 810-32.

Kroszner, Randall, and Raghuram G. Rajan, 1997, "Organization Structure and Credibility: Evidence from Commercial Bank Securities Activities before the Glass-Steagall Act," *Journal of Monetary Economics* 39, 475-516.

Mullineaux, Donald J., 2003, "Tying and Subsidized Loans: A Doubtful Problem," Working Paper, University of Kentucky.

Pulley, L., and Humphrey D., 1993, "The Role of Fixed Costs and Cost Complementarities in Determining Scope Economies and the Costs of Narrow Banking Proposals," *Journal of Business* 66, 437-462.

Puri, Manju, 1994, "The Long-Term Default Performance of Bank Underwritten Securities Issues," *Journal of Banking and Finance* 18, 397-481.

Puri, Manju, 1996, “Commercial Banks in Investment Banking Conflict of Interest or Certification Role?,” *Journal of Financial Economics* 40, 373-401.

Rajan, Raghuram, 1992, “Insiders and Outsiders: The Choice between Informed and Arm’s Length Debt,” *Journal of Finance* 47, 1367-1400.

Rajan, Raghuram, 1995, “The Entry of Commercial Banks into Securities Business: A Selective Survey of Theories and Evidence,” mimeo, University of Chicago.

Roten, Ivan C., and Donald Mullineaux, 2002, “Debt Underwriting by Commercial Bank-affiliated Firms and Investment Banks: More Evidence,” *Journal of Banking and Finance* 26, 689-718.

Schenone, Carola, 2004, “The Effect of Banking Relationships on the Firm’s IPO Underpricing,” *Journal of Finance* 59, 2903-2958.

Shadow Financial Regulatory Committee, 2000, Reforming Bank Capital Regulation, Washington, D.C.: AEI Press.

Sharpe, S., 1990, “Asymmetric Information, Bank Lending and Implicit Contracts: A Stylized Model of Customer Relationships,” *Journal of Finance* 45, 1069-1088.

Sufi, Amir, 2004, “Does Joint Production of Lending and Underwriting Help or Hurt Firms? A Fixed Effects Approach,” Working Paper, Massachusetts Institute of Technology.

White, Eugene N., 1986, “Before the Glass-Steagall Act: An Analysis of the Investment Banking Activities of National Banks,” Explorations in Economic History 23, January, 33-55.

Appendix Table I

Ordered Probit Regression for Predicting Bond Rating for Missing Observations

This table presents an ordered probit regression predicting senior debt rating for borrowers with credit rating data available from DealScan database. This estimated equation is used to forecast the senior debt ratings for the rest of the observations with no rating data available. The numerical codes for rating used in the estimation are:0=CCC or below,1 = B,2=BB, 3=BBB, 4=A, 5=AA, 6=AAA. The accuracy of the in-sample forecast is shown at the bottom of the table, where the percent correctly predicted is reported. The year and industry dummies are included in the regression but not reported.

	Coefficient	Std Err	
INTERCEPT 0	7.4834	0.4514	***
INTERCEPT 1	8.9380	0.4530	***
INTERCEPT 2	10.0082	0.4565	***
INTERCEPT 3	11.1898	0.4615	***
INTERCEPT 4	12.5329	0.4684	***
INTERCEPT 5	13.8831	0.4822	***
LNASSET	-0.4701	0.0170	***
SIC1	-0.6231	0.2056	***
SIC2	-1.0277	0.1984	***
SIC3	-0.5356	0.1977	***
SIC4	-0.6880	0.2081	***
SIC5	-0.4279	0.1999	**
SIC7	-0.5443	0.2113	***
SIC8	-0.4099	0.2194	*
ADJMKTLEVERAGE	1.3869	0.1113	***
INVTURNC	0.0033	0.0016	**
INVTURNS	-0.0033	0.0010	***
ROA	-4.6410	0.2689	***
ROE	-0.0162	0.0066	**
INTCOVER	0.0011	0.0008	
INT_DEBT	0.0611	0.0378	
STDEBTOVERDEBT	-0.9135	0.0998	***
CURRATIO	0.1264	0.0437	***
QUICKRATIO	-0.0873	0.0507	*
CURASSET_A	-0.5685	0.1349	***
N		3673	
Likelihood function		-4607	
% correctly predicted		48%	
% correctly predicted within + / - 1 rating level		93%	

***,**,* denote significant difference at 1%, 5%, and 10% level, respectively.

Appendix Table II
Examples of How Firm Financing and Bank Relationship Variables are Assigned

Example 1 Each Event has Only One Banker

This example illustrates how we assign values to vectors of relationship dummy variables associated with events in a given financing windows (LDLEL window). Table 4 provides the definitions of these dummy variables.

Sequence of events Single Lead Banker	Loan Bank A	Debt Bank B	Loan Bank A	Equity Bank B	Loan Bank B
Variables	Assigned Values				
PL	0	1	1	1	1
PD	0	0	1	1	1
PE	0	0	0	0	1
MPL	0	0	1	0	0
MPD	0	0	0	1	1
MPE	0	0	0	0	1
SL	1	1	1	1	0
SD	1	0	0	0	0
SE	1	1	1	0	0
MSL	1	1	0	1	0
MSD	0	0	0	0	0
MSE	0	1	0	0	0
Obs Used in Regs	✕	✔	✕	✔	✔

Example 2 Each Event has Multiple Bankers but One Dominant Relationship for the Window

This example illustrates how we assign values to vectors of relationship dummy variables associated with events in a given financing windows (LDL window) when there are multiple bankers in some deals and one dominant relationship.

Sequence of events	Loan		Debt		Loan	
Joint Lead Bankers	Bank A	Bank B	Bank B	Bank C	Bank A	Bank B
Variables	Assigned Values					
PL	0	0	1	1	1	1
PD	0	0	0	0	1	1
PE	0	0	0	0	0	0
MPL	0	0	1	0	1	1
MPD	0	0	0	0	0	1
MPE	0	0	0	0	0	0
SL	1	1	1	1	0	0
SD	1	1	0	0	0	0
SE	0	0	0	0	0	0
MSL	1	1	1	0	0	0
MSD	0	1	0	0	0	0
MSE	0	0	0	0	0	0
Obs Used in Regs	✕	✔	✔	✕	✕	✔

Appendix Table III

GMM Estimates of Loan Pricing and Quantity Regressions - Only Observations from Clean Subsample

This table provides a robustness check for Table VI in the text. Section 3 in the main text describes our approach in determining unique relationship within matched windows with multiple relationships. The clean subsample used for this table included only matched loans from the financial windows with unique relationship.

	LNSPREAD Regressions					LNAMT Regressions			
	A: No IB Interaction		B: IB Interaction			C: No IB Interaction		D: IB Interaction	
	Coefficient	Std Err	Coefficient	Std Err		Coefficient	Std Err	Coefficient	Std Err
INTERCEPT	7.0794	0.2686 ***	7.1302	0.2712 ***	INTERCEPT	13.0997	1.9383 ***	13.0777	1.8633 ***
LNAMT	0.0555	0.0224 **	0.0534	0.0215 **	LNSPREAD	-1.4045	0.2561 ***	-1.4949	0.2514 ***
PL	0.0053	0.0167	0.0043	0.0164	PL	-0.0687	0.0355 *	-0.0669	0.0375 *
PD	-0.0456	0.0182 **	-0.0445	0.0188 **	PD	-0.0380	0.0384	-0.0419	0.0384
PE	-0.0004	0.0187	-0.0014	0.0194	PE	0.2440	0.0361 ***	0.2386	0.0374 ***
MPL	0.0166	0.0124	0.0217	0.0128 *	MPL	-0.0012	0.0265	-0.0016	0.0276
MPD	0.0040	0.0230	-0.0003	0.0257	MPD	-0.0608	0.0468	-0.0828	0.0485 *
MPE	-0.0431	0.0205 **	0.0165	0.0524	MPE	-0.2768	0.0696 ***	-0.2166	0.1104 **
SL	0.0314	0.0162 *	0.0330	0.0192 *	SL	0.0573	0.0399	0.0598	0.0407
SD	-0.1532	0.0196 ***	-0.1587	0.0201 ***	SD	-0.0161	0.0498	-0.0219	0.0509
SE	0.0438	0.0255 *	0.0443	0.0228 *	SE	0.1836	0.0474 ***	0.1859	0.0464 ***
MSL	0.0110	0.0153	0.0131	0.0151	MSL	-0.0763	0.0316 **	-0.0768	0.0325 **
MSD	-0.0231	0.0192	-0.0142	0.0214	MSD	-0.0690	0.0401 *	-0.0493	0.0215 **
MSE	0.0922	0.0385 **	0.1622	0.0582 ***	MSE	-0.0592	0.0897	-0.1146	0.1605
IB	0.0697	0.0194 ***	0.0819	0.0330 **	IB	0.1527	0.0386 ***	0.1038	0.0506 **
IB_PL			0.0093	0.0457	IB_PL			0.0141	0.0863
IB_PD			0.0006	0.0617	IB_PD			0.1033	0.0952
IB_PE			0.0088	0.0519	IB_PE			-0.0114	0.0991
IB_MPL			-0.0751	0.0426 *	IB_MPL			0.0378	0.0847
IB_MPD			0.0471	0.0666	IB_MPD			0.0108	0.1109
IB_MPE			-0.0998	0.0244 ***	IB_MPE			-0.1155	0.1691
IB_SL			-0.0715	0.0562	IB_SL			-0.0800	0.1114
IB_SD			0.1293	0.0598 **	IB_SD			0.1230	0.1170
IB_SE			-0.0580	0.0507	IB_SE			-0.1390	0.1137
IB_MSL			-0.0150	0.0562	IB_MSL			0.0751	0.1030
IB_MSD			-0.1358	0.0747 *	IB_MSD			-0.1897	0.1321
IB_MSE			-0.0450	0.0774	IB_MSE			0.2314	0.2057
MULTIPLELENDER	0.0291	0.1020	0.0290	0.1060	SALEGROWTH	0.0693	0.0326 **	0.0661	0.0316 **
LNTOTLENDING	-0.0132	0.0034 ***	-0.0138	0.0035 ***	MVE_BVE	0.0012	0.0001 ***	0.0008	0.0001 ***

Appendix Table III (continue)

GMM Estimates of Loan Pricing and Quantity Regressions - Only Observations from Clean Subsample

	LNSPREAD Regressions								
	A: No IB Interaction		B: IB Interaction			C: No IB Interaction		D: IB Interaction	
	Coefficient	Std Err	Coefficient	Std Err	LNAMT Regressions	Coefficient	Std Err	Coefficient	Std Err
LNMATURE	-0.1111	0.0237 ***	-0.1159	0.0242 ***	MULTIPLELENDER	1.3586	0.2361 ***	1.4828	0.2275 ***
TERMB	0.1435	0.0343 ***	0.1484	0.0351 ***	LNTOTLENDING	-0.0045	0.0082	-0.0046	0.0085
TERMBSUB	0.2774	0.0381 ***	0.2715	0.0397 ***	LNMATURE	0.0159	0.0514	0.1776	0.1565
REVOLVER	-0.1439	0.0255 ***	-0.1344	0.0248 ***	TERMB	0.6771	0.0730 ***	0.6771	0.0730 ***
STREVOLVER	-0.3381	0.0421 ***	-0.3381	0.0420 ***	TERMBSUB	0.4270	0.1232 ***	0.4513	0.1153 ***
BRIDGE	-0.0070	0.0707	-0.0102	0.0714	REVOLVER	0.2272	0.0508 ***	0.2162	0.0540 ***
COMBODEAL	0.2723	0.0245 ***	0.2708	0.0239 ***	STREVOLVER	0.0313	0.1096	0.0294	0.1152
SECURE	0.2719	0.0216 ***	0.2718	0.0205 ***	BRIDGE	0.7496	0.1378 ***	0.7548	0.1486 ***
PERFPRC	-0.0311	0.0167 *	-0.0324	0.0167 *	COMBODEAL	0.1452	0.0726 **	0.1443	0.0684 **
PRIME	0.8057	0.0966 ***	0.7984	0.1017 ***	SECURE	0.3479	0.0827 ***	0.3594	0.0816 ***
SUBORDINATE	0.2113	0.0874 **	-0.2082	0.0794 ***	PERFPRC	0.1554	0.0313 ***	0.1594	0.0318 ***
TAKEOVER	-0.0670	0.0420	-0.0660	0.0407	TAKEOVER	0.7144	0.0476 ***	0.7155	0.0508 ***
CAPRESTRUC	-0.0786	0.0475 *	-0.0764	0.0470	CAPRESTRUC	0.5160	0.0925 ***	0.5106	0.0974 ***
CPBACKUP	-0.2341	0.0255 ***	-0.2346	0.0261 ***	CPBACKUP	-0.0295	0.0702	-0.0299	0.0680
DEBTREPAY	-0.0636	0.0247 **	-0.0686	0.0249 ***	DEBTREPAY	0.2490	0.0462 ***	0.2541	0.0445 ***
BUYOUT	0.1496	0.0547 ***	0.1462	0.0551 ***	BUYOUT	0.3931	0.1257 ***	0.3835	0.1312 ***
WORKCAP	-0.0172	0.0263	-0.0180	0.0250	WORKCAP	0.1428	0.0562 **	0.1474	0.0584 **
LNASSET	-0.0866	0.0255 ***	-0.0887	0.0246 ***	LNASSET	0.4976	0.0212 ***	0.4916	0.0214 ***
ADJMKTLEVERAGE	0.4887	0.0586 ***	0.4666	0.0586 ***	ADJMKTLEVERAGE	1.8031	0.1682 ***	1.8655	0.1714 ***
AAA	-1.9484	0.0671 ***	-1.9037	0.0649 ***	AAA	-2.1262	0.5029 ***	-2.0034	0.4945 ***
AA	-1.7495	0.0661 ***	-1.8198	0.0648 ***	AA	-1.4806	0.4262 ***	-1.4425	0.4394 ***
A	-1.3890	0.0622 ***	-1.4209	0.0588 ***	A	-1.2095	0.3464 ***	-1.1622	0.3578 ***
BBB	-0.7534	0.0522 ***	-0.7473	0.0523 ***	BBB	-0.5803	0.2087 ***	-0.5795	0.1997 ***
BB	-0.2766	0.0446 ***	-0.2674	0.0427 ***	BB	-0.1365	0.1078	-0.1471	0.1103
B	-0.0878	0.0439 **	-0.0849	0.0423 **	B	-0.2146	0.0906 **	-0.2192	0.0899 **
RATEFORE	0.0337	0.0170 **	0.0318	0.0167 *	RATEFORE	-0.1439	0.0313 ***	-0.1563	0.0298 ***
N		12405		12405	N		12405		12405
GMM Obj Fn		792.7		961.4	GMM Obj Fn		855.9		779.0

Specification Tests

1. Overidentification test for validity of instruments (H0:instruments are exogenous) based on GMM Objective Function / N

jointly	Chi-sq(2)	0.0639		0.0775	Chi-sq(2)		0.0690		0.0628

Appendix Table IV
Loan Pricing and Quantity Regressions (OLS)

This table presents OLS regressions of log all-in-spread and log amount of all loans used in Table IV. Model A and C include IB dummy but does not interact with financing pattern and relationship variables. Model B and D allow IB interaction.

	LNSPREAD Regressions					LNAMT Regressions			
	A: No IB Interaction		B: IB Interaction			C: No IB Interaction		D: IB Interaction	
	Coefficient	Std Err	Coefficient	Std Err		Coefficient	Std Err	Coefficient	Std Err
INTERCEPT	7.2406	0.0935 ***	6.8370	0.0891 ***	INTERCEPT	5.4740	0.1809 ***	5.6467	0.1852 ***
LNAMT	-0.1023	0.0040 ***	-0.1010	0.0039 ***	LNSPREAD	-0.3871	0.0129 ***	-0.3796	0.0123 ***
PL	0.0096	0.0089	0.0089	0.0090	PL	-0.0196	0.0164	-0.0188	0.0164
PD	-0.0478	0.0094 ***	-0.0471	0.0098 ***	PD	-0.0354	0.0174 **	-0.0382	0.0183 **
PE	0.0612	0.0090 ***	0.0605	0.0091 ***	PE	0.2388	0.0174 ***	0.2460	0.0171 ***
MPL	0.0071	0.0087	0.0110	0.0090	MPL	-0.0266	0.0161 *	-0.0306	0.0177 *
MPD	-0.0183	0.0200	-0.0206	0.0241	MPD	-0.0743	0.0394 *	-0.1057	0.0435 **
MPE	-0.0858	0.0376 **	-0.0112	0.0597	MPE	-0.1788	0.0669 ***	-0.1437	0.1118
SL	0.0350	0.0094 ***	0.0389	0.0099 ***	SL	0.0013	0.0177	-0.0002	0.0181
SD	-0.1623	0.0096 ***	-0.1560	0.0096 ***	SD	0.0967	0.0177 ***	0.0897	0.0177 ***
SE	0.0253	0.0103 **	0.0277	0.0098 ***	SE	0.1543	0.0182 ***	0.1686	0.0181 ***
MSL	-0.0181	0.0094 *	-0.0152	0.0096	MSL	-0.0386	0.0175 **	-0.0467	0.0182 **
MSD	-0.0326	0.0197 *	-0.0264	0.0200	MSD	-0.0407	0.0368	-0.0356	0.0383
MSE	0.0832	0.0396 **	0.1357	0.0547 **	MSE	-0.1426	0.0701 **	-0.1993	0.1075 *
IB	0.0902	0.0160 ***	0.1442	0.0239 ***	IB	0.1466	0.0283 ***	0.0769	0.0459 *
IB_PL			0.0009	0.0404	IB_PL			-0.0071	0.0721
IB_PD			-0.0359	0.0528	IB_PD			0.0752	0.0936
IB_PE			0.0242	0.0479	IB_PE			-0.0240	0.0865
IB_MPL			-0.0714	0.0410 *	IB_MPL			0.0870	0.0739
IB_MPD			0.0708	0.0600	IB_MPD			0.0474	0.1147
IB_MPE			-0.1382	0.0882	IB_MPE			-0.0861	0.1525
IB_SL			-0.0747	0.0433 *	IB_SL			-0.0099	0.0790
IB_SD			0.1148	0.0513 **	IB_SD			0.0952	0.0999
IB_SE			-0.0698	0.0511	IB_SE			-0.1071	0.0997
IB_MSL			-0.0176	0.0444	IB_MSL			0.1304	0.0857
IB_MSD			-0.1209	0.0645 *	IB_MSD			-0.1432	0.1209
IB_MSE			-0.0125	0.0871	IB_MSE			0.1485	0.1647
MULTIPLELENDER	-0.0459	0.0176 ***	-0.0439	0.0171 **	SALEGROWTH	0.0592	0.0172 ***	0.0560	0.0185 ***
LNTOTLENDING	-0.0104	0.0018 ***	-0.0104	0.0019 ***	MVE_BVE	0.0008	7.8333	0.0009	0.0001 ***

Appendix Table IV (continue)
Loan Pricing and Quantity Regressions (OLS)

	LNSPREAD Regressions					LNAMT Regressions			
	A: No IB Interaction		B: IB Interaction			C: No IB Interaction		D: IB Interaction	
	Coefficient	Std Err	Coefficient	Std Err		Coefficient	Std Err	Coefficient	Std Err
LNMATURE	-0.0859	0.0078 ***	-0.0894	0.0074 ***	MULTIPLELENDER	0.8778	0.0302 ***	0.8730	0.0312 ***
TERMB	0.2884	0.0166 ***	0.3081	0.0162 ***	LNTOTLENDING	0.0257	0.0035 ***	0.0254	0.0035 ***
TERMBSUB	0.3966	0.0283 ***	0.3964	0.0291 ***	LNMATURE	0.1664	0.0139 ***	0.1713	0.0134 ***
REVOLVER	-0.0150	0.0084 *	-0.0147	0.0090	TERMB	0.3981	0.0298 ***	0.3767	0.0304 ***
STREVOLVER	-0.2161	0.0150 ***	-0.2310	0.0141 ***	TERMBSUB	0.0116	0.0571	0.0150	0.0568
BRIDGE	0.1721	0.0260 ***	0.1774	0.0266 ***	REVOLVER	0.3768	0.0152 ***	0.3700	0.0165 ***
COMBODEAL	0.2330	0.0087 ***	0.2217	0.0086 ***	STREVOLVER	0.3123	0.0265 ***	0.3372	0.0272 ***
SECURE	0.3493	0.0080 ***	0.3428	0.0083 ***	BRIDGE	0.7415	0.0484 ***	0.7784	0.0487 ***
PERFPRC	-0.1257	0.0220 ***	-0.1316	0.0222 ***	COMBODEAL	-0.2965	0.0158 ***	-0.2824	0.0170 ***
PRIME	0.4768	0.0198 ***	0.4433	0.0191 ***	SECURE	0.0399	0.0156 **	0.0423	0.0167 **
SUBORNINATE	0.1209	0.0612 **	0.1250	0.0602 **	PERFPRC	0.0839	0.0421 **	0.0809	0.0409 **
TAKEOVER	0.0614	0.0111 ***	0.0636	0.0109 ***	TAKEOVER	0.6945	0.0194 ***	0.7208	0.0192 ***
CAPRESTRUC	0.0974	0.0219 ***	0.0998	0.0211 ***	CAPRESTRUC	0.5209	0.0407 ***	0.5505	0.0396 ***
CPBACKUP	-0.2086	0.0110 ***	-0.2154	0.0118 ***	CPBACKUP	0.1649	0.0220 ***	0.1686	0.0200 ***
DEBTREPAY	-0.0152	0.0093	-0.0143	0.0093	DEBTREPAY	0.2693	0.0187 ***	0.2632	0.0187 ***
BUYOUT	0.2333	0.0203 ***	0.2522	0.0215 ***	BUYOUT	0.2651	0.0410 ***	0.2810	0.0405 ***
WORKCAP	0.0058	0.0118	0.0057	0.0126	WORKCAP	0.1088	0.0224 ***	0.1034	0.0237 ***
LNASSET	0.0278	0.0036 ***	0.0274	0.0038 ***	LNASSET	0.5595	0.0056 ***	0.5764	0.0054 ***
ADJMKTLEVERAGE	0.6780	0.0214 ***	0.6301	0.0224 ***	ADJMKTLEVERAGE	1.5595	0.0400 ***	1.4977	0.0389 ***
AAA	-1.6768	0.0587 ***	-1.7124	0.0556 ***	AAA	-0.2421	0.1039 **	-0.2305	0.1064 **
AA	-1.5424	0.0295 ***	-1.4777	0.0285 ***	AA	0.2668	0.0585 ***	0.2708	0.0584 ***
A	-1.1319	0.0243 ***	-1.1004	0.0233 ***	A	0.0443	0.0444	0.0436	0.0457
BBB	-0.5778	0.0205 ***	-0.5642	0.0204 ***	BBB	0.1035	0.0397 ***	0.1020	0.0397 **
BB	-0.1917	0.0195 ***	-0.1883	0.0197 ***	BB	0.1150	0.0380 ***	0.1201	0.0366 ***
B	-0.1022	0.0202 ***	-0.0972	0.0203 ***	B	-0.1039	0.0369 ***	-0.1081	0.0373 ***
RATEFORE	0.0030	0.0088	0.0031	0.0088	RATEFORE	-0.1787	0.0165 ***	-0.1764	0.0160 ***
Adj R-sq		0.8075		0.8097	Adj R-sq		0.8017		0.7968
N		14439		14439	N		14439		14439